

Lucent Technologies
Bell Labs Innovations



DACS II AX 4/11
Release 9.02
User's Guide

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Regulatory information is found in the application module chapters of this guide (chapters 11 through 22).

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Overview

Purpose of This Guide

This guide provides procedures and reference information on the installation and operation of the DACS II Access Cross-Connect (AX) system, Release 9.02.

Intended Audience

This guide is intended for users of the DACS II AX.

Recommended Prerequisites

The DACS II AX administrator should have a working knowledge of the following:

- basic data communications
 - the administration of Local Area Networks (LANs)
 - operational characteristics of the network interfaces to the AX
 - SNMP and IP concepts
 - application modules
 - digital cross-connect systems
-

What's New in this Release?

DACS II AX Release 9.02 includes:

- **Hybrid DS-3 Module** set allows the DACS II AX to connect to a DS-3 compatible link, and is capable of multiplexing up to 28 T1 links or 21 E1 links into a single DS-3 signal.
 - **Listen-Source and Listen-Destination capabilities** allow non-intrusive monitoring by a listening port for test access or broadcast capabilities on the Octal T1/E1, DS-3, Hybrid DS-3, and STS-1 modules.
 - **Dynamic Host Configuration Protocol (DHCP)** functionality added to the Channelized Router Hub Module. With this capability, the DACS II AX 4/11 acting as a server can dynamically distribute IP addressing and configuration information to clients.
-

Document Organization

Chapter Contents

This guide is divided into the following chapters:

- **About This Guide** provides information on how this guide is organized, and how to order documents.
- **Chapter 1: Overview** provides introductory information on the DACS II AX and its features.
- **Chapter 2: Installation** provides information on setting up the hardware, logging into the AX and using the DACS II AX software.
- **Chapter 3: Node Summary Menu** introduces the Node Summary Menu which is used to access the installed application modules on the DACS II AX equipment chassis and the N + 1 Protection Switch.
- **Chapter 4: System Configuration** provides information on slot configuration, system parameters, and user administration.
- **Chapter 5: Connection Maps Configuration** provides information on setting up Connections Maps and configuring connections.
- **Chapter 6: Events** provides information on monitoring events, displaying the event log, and saving event data.
- **Chapter 7: Utilities** provides information on the diagnostic utilities that you can access on the DACS II AX, including ping, MIB tables, IP routing, and ARP tables.
- **Chapter 8: Clocking** provides a description of the DACS II AX system clocking functions and how to configure them.
- **Chapter 9: Alarms** provides a description of the alarm conditions that are reported via the SMC II LEDs and the contact closures.
- **Chapter 10: N + 1 Protection Switch** provides information on the N + 1 Protection Switch, configuring protection switch groups, and switching over to a standby card.
- **Chapter 11: Quad DS-1 Module** provides information on configuration and diagnostics of a Quad DS-1 module.
- **Chapter 12: Quad High Speed Module** provides information on configuration and diagnostics of a Quad High Speed module.
- **Chapter 13: DS-3 Module** provides information on configuration and diagnostics of a DS-3 module.
- **Chapter 14: Quad OCU Module** provides information on configuration and diagnostics of a Quad OCU module.
- **Chapter 15: Quad DS-1 with xDSL Module** provides information on configuration and diagnostics of a Quad DS-1 with xDSL module.

Document Organization (Continued)

Chapter Contents (Continued)

- **Chapter 16: Test Access Module (TAM)** provides information on test access.
 - **Chapter 17: Octal T1/E1 Module** provides information on configuration and diagnostics of an Octal T1/E1 module.
 - **Chapter 18: Octal Voice Module** provides information on configuration and diagnostics of an Octal Voice module.
 - **Chapter 19: Octal High Speed Data Module** provides information on configuration and diagnostics of an Octal High Speed Data module.
 - **Chapter 20: Channelized Router Module** provides information on configuration of the channelized router module. This module supports a LAN/WAN connection via an integral 12-port hub with up to 32 network time slots channelization for industry standard protocols, including TCP, IP, IPX, and RIP, RIP 2, OSPF, and NAT, and Frame Relay.
 - **Chapter 21: STS-1 Module** provides information on configuration and diagnostics of the STS-1 module. The STS-1 Module provides a 52 Mbps SONET (Synchronous Optical Network) signal to Path Terminating Equipment (PTE).
 - **Chapter 22: Hybrid DS-3 Module** provides information on configuration and diagnostics of the hybrid DS-3 module. The hybrid DS-3 module supports a single hybrid DS-3 link (containing a mix of up to 28 DS1s or 21 E1s per ITU G.747) with M13 or C-bit framing plus integral BERT and loopback diagnostics.
 - **Appendix A: TFTP/Telnet** provides information on using TFTP to download software to the SMC or to back up the configuration files on the DACS II AX. This appendix also describes how to use telnet to access a DACS II AX.
 - **Appendix B: Cables and Interfaces** provides information on connectors and pin assignments.
 - **Appendix C: Installation and Upgrade Procedures** provides an overview of the installation and upgrade process. For details, refer to *DACS II AX Release 9.02 Software Release Description*.
 - **Glossary** includes a list of frequently used terms, acronyms, and abbreviations that appear in this guide.
-

Related Information

Related Documents

The *DACS II AX 4/11 Release 9.02 Software Release Description* contains information on the features of this release and detailed upgrade procedures. The software release description is included on the CD-ROM with the DACS II AX software.

Networking Primers

For background information on protocols and networking concepts, you may want to visit the Library of Congress Internet Resource Page at:

<http://lbweb.loc.gov/global/internet/training.html>

In addition, Lucent Technologies' Learning and Performance Center offers several courses on data networking. For course descriptions and further information:

- From the U.S., call 1-800-228-0710
 - From outside the U.S., call 1-303-889-0202
-

Ordering Documents

How to Order Documents

Copies of this document can be ordered through the Lucent Technologies Customer Information Center (CIC). For automatic updates for one year, request that the document be given "standing order" status.

To order documents, call or fax the Customer Information Center:

For Customers in	Call	FAX
United States	1- 888-582-3688 (1-888-LUCENT-8)	1-800-566-9568
North America (outside of U.S.)	1- 317-322-6619	1-317-322-6359
Europe, Middle East, or Africa	1- 317-322-6416 or 44 166683 2900	1-3170322-6699 or 44 166683 2213
Asia, Pacific Region, China, Caribbean, and Latin America	1- 317-322-6411	1-317-322-6699

The above information is also listed at the Customer Information Center website:

[/http://www.lucentdocs.com/](http://www.lucentdocs.com/)

Click on **Help**, then choose **How to contact CIC** to display contact information for U.S. and International customers.

Documentation Conventions

Typeface

The following conventions are used throughout this guide.

- Field names appear in bold type; for example:

Site Name

- User entries appear in capital letters in bold type; for example:

Type **B** to scroll to the previous menu choice.



NOTE:

When typing single-letter commands, such as **B**, the AX system is not case-sensitive. You can type uppercase or lowercase letters for commands.

Terminology

The word *select* is used to mean move the cursor to the desired option and press **<Enter>**. To move the cursor, use the arrow keys on the keyboard, the spacebar, or backspace key. For further information on menu navigation, see Chapter 2.

Overview

1

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DACS II AX Models

Overview

The DACS II Access Cross-Connect (DACS II AX), available in two chassis configurations, is designed specifically for the accelerating changes that take place in multi-service networks. The DACS II AX has the capabilities and flexibility necessary to be the right-sized solution for both the Digital Access Cross-Connect System (DACS) and the Integrated Access Device (IAD) applications.

The standard components of the DACS II AX system include equipment chassis, power supply modules, system manager cards, and application/interface module sets. Each are described in the following subsections.

DACS II AX Models (Continued)

DACS II AX 11

The DACS II AX 11 (Figure 1-1) is a 10.5" (6 rack unit) high, 19" wide flush mount chassis. (An optional 23" flush and 23" center mount is available.) It accommodates up to eleven module sets consisting of a front application module and a rear interface module in addition to its system manager card and modular power supply. The DACS II AX 11 also supports an optional redundant system manager card and an optional load sharing power supply module.

The DACS II AX 11 resident TDM mid-plane can support time slot level cross-connects for the equivalent of 168 T1s on a non-blocking basis. In its most simplistic configurations, the DACS II AX 11 can be used as a 88-port T1/E1 (11 Octal T1/E1 module sets) or a 6-port DS-3 DACS.



Figure 1-1. DACS II AX 11 - Front View

DACS II AX Models (Continued)

DACS II AX 4

The DACS II AX 4 (Figure 1-2) is a 5.25" (3 rack unit) high tabletop chassis. (An optional 19" wide flush and center mount is available.) The DACS II AX 4 accommodates up to four module sets in addition to its system manager card and integrated power supply. It also supports an optional redundant system manager card.

The DACS II AX 4 mid-plane architecture and capacity is identical to that of the DACS II AX 11. In this case, a 32-port T1/E1 or 4-port DS-3 DACS can be configured.

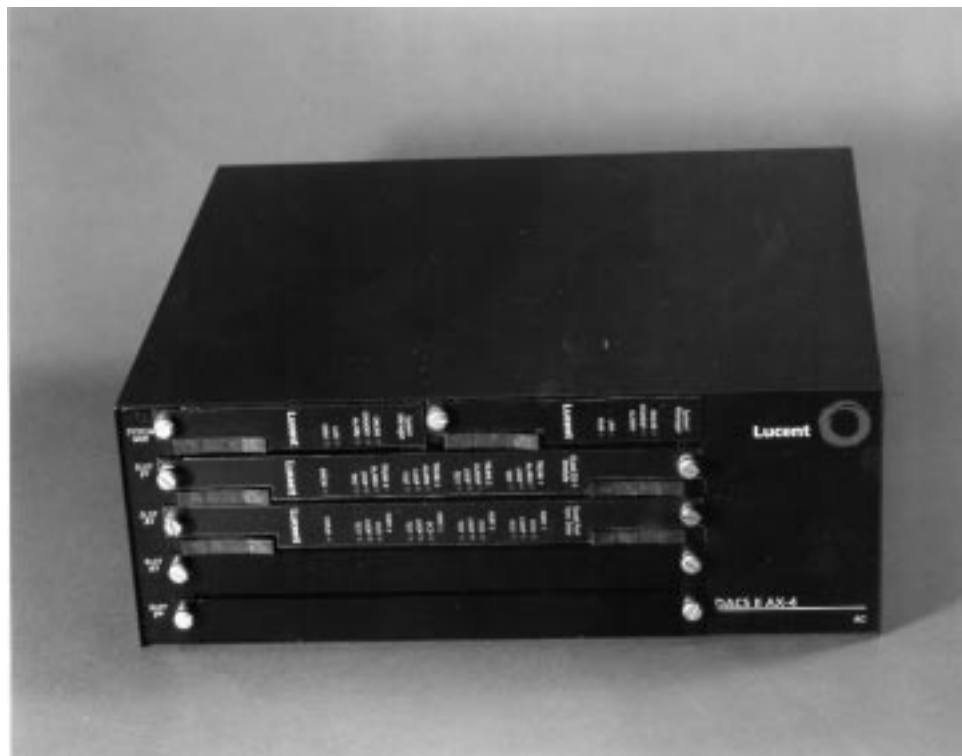


Figure 1-2. DACS II AX 4

N+1 Protection Switch

Overview

The N+1 Protection Switch is designed to provide optional automatic protection for narrowband and broadband module sets if one of those devices become non-operational. This is accomplished by providing a redundant module set of the same type as those it is protecting. For example, if a primary DS-3 device fails, then a redundant DS-3 device will act as a back-up and take over with minimal down time and without user intervention. For details on the N+1 Protection Switch, see *Chapter 10, N+1 Protection Switch*.

The N+1 Protection Switch is available with the DACS II AX 11 and rests on top of the DACS II AX 11 chassis(Figure 1-3). A DACS II AX 4 cannot be equipped with an N+1 Protection Switch.



Figure 1-3. DACS II AX 11 with N+1 Protection Switch - Front View

N+1 Protection Switch (Continued)

N + 1 Protection Switch Controller Board

The N+1 Protection Switch Controller Board, (Figure 1-4), provides communication between the DACS II AX SMC II interface module and the N+1 Protection Switch. The Controller board has a DB9 connector and a dual state red/green LED to indicate the status of the board.

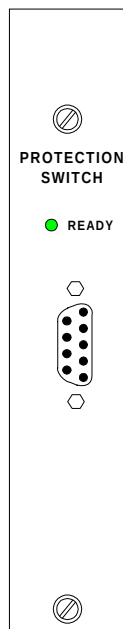


Figure 1-4. N+1 Protection Switch Controller Board

Ready LED

The **READY** LED on the Protection Switch Controller board will flash **red** during initialization or if the Protection Switch is offline. The LED will flash **green** continuously when the Protection Switch status is online.

System Manager Card (SMC)

Overview

The System Manager Card provides the DACS II AX management capabilities. Communications and control of the DACS II AX are facilitated through the System Manager Card. The System Manager Card stores all system configuration information and cross-connect maps.

There are two versions of the SMC: SMC I and SMC II. SMC II is required for the N+1 Protection Switch.

Redundant System Manager Cards

Both the DACS II AX 11 and the DACS II AX 4 can be equipped with two System Manager Cards. Redundancy offers these benefits:

- If the online unit fails the standby System Manager is automatically switched in.
- The online SMC automatically copies configuration changes to the standby SMC. Databases are kept in sync. There is also a Copy File System option on the Utilities menu which allows you to copy changes to the standby SMC manually.

The DACS II AX application modules are controlled by the on-line System Manager Card via a pair of communication busses on the DACS II AX mid-plane. The standby System Manager Card will automatically assume control if the primary System Manager Card fails.

Features

The System Manager Card has these features:

- Controls all Application Module Sets
- Controls System Timing
- A battery-backed clock for maintaining the time and date
- Contains non-volatile FLASH Memory for configuration storage
- Stores system configuration information and cross-connect maps
- Software Upgradeable (via Flash Memory). The software can be downloaded via Ethernet. The online SMC can download information to the cards resident in the system, including cross-connect data and software updates
- Provides 20 user logins
- Controls SNMP Traps & Alarm Events.

SMC I

SMC I Diagram

Figure 1-5 shows the front and rear boards of the SMC I.

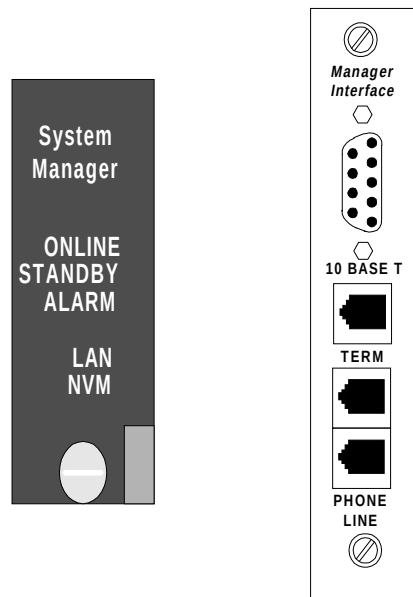


Figure 1-5. SMC I Front and Rear Half-size Boards

SMC I (Continued)

Overview

There are two versions of the SMC. The SMC I is the earlier version of the SMC. The SMC II offers several enhancements and it is required for the N+1 Protection Switch.

SMC I LEDs

The SMC I front card is a half-size board that has the following LED indicators:

Indicator	Color	Meaning
ONLINE	Green	Indicates that this SMC is on-line and active.
STANDBY	Yellow	SMC is in standby state, waiting to go "online" should the other SMC fail.
ALARM	Red	SMC is malfunctioning. SMC goes offline.
LAN	Flashing Green	Data is being forwarded to/from the LAN port.
NVM	Flashing Green	Non-volatile memory light. Indicates reads and writes to FLASH memory.

SMC I Connectors

The SMC I rear interface is a half-size board with the following connectors:

- **10 BaseT** - An Ethernet LAN port provides an RJ45 connection.
 - **Terminal** - One console port provides an RJ-11 TELCO port for external terminal connection.
 - **Phone Line** - An RJ-11 port for integral a modem connection.
 - **AUI** - Lan Connector.
-

SMC II

SMC II Diagram

Figure 1-6 shows the front and rear cards of the SMC II.

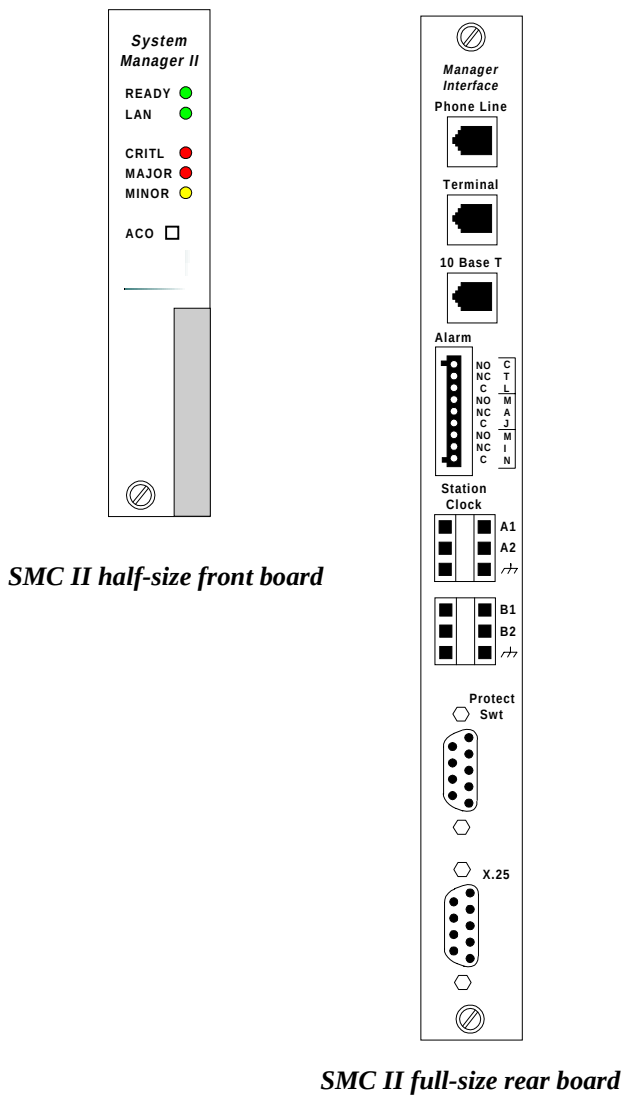


Figure 1-6. SMC II Front and Rear Boards

SMC II (Continued)

SMC II LEDs

The SMC II front card is a half-size board that has the following LED indicators and push button:

- **READY** - Solid green=Online; Blinking Green=Standby; Red= Failure.
 - **LAN** - Blinking green=LAN activity.
 - **CRITL** (solid red) - Solid red=Critical alarm present.
 - **MAJOR** (solid red) - Solid red=Major alarm present.
 - **MINOR** (yellow) - Solid yellow=Minor alarm present.
 - **ACO** (*Alarm Cut Off*) - Momentary alarm reset push button.
-

SMC II Connectors

The SMC II rear interface is a full-size board that supports the following connections:

- **Phone Line** - An RJ-11 port for integral a modem connection.
 - **Terminal** - One console port provides an RJ-11 TELCO port for external terminal connection.
 - **10 BaseT** - An Ethernet LAN port provides an RJ45 connection.
 - **Alarm** - A 9-position alarm terminal block for critical, major and minor contact closures.
 - **Station Clock** - Two 3-position terminal blocks for 64 kbps BITS composite clock inputs A and B.
 - **Protect Swit** - A DB-9 pin serial interface connector for the N+1 Protection Switch.
 - **X.25** - A DB-9 pin connector for an HDLC interface. Currently not used.
-

Redundant Power Supplies

The DACS II AX 11 can be equipped with dual load-sharing power supplies. Either supply can operate with a full load. The redundancy can be implemented with two AC supplies or two DC supplies. Each power supply module has its own independent AC or DC inlet, as appropriate, on rear of chassis.

The DACS II AX 4 has one power supply. The power supply can be AC or DC.

Application/Interface Module Sets

Overview

The module sets consist of two elements, the front application module and the rear interface module. The front application module contains the cross-connect bus interface circuitry and control-processor functions. The rear interface module contains the necessary electrical interfaces and connections for its associated application module. New interfaces are added to the DACS II AX by the addition of a front and rear module combination. All application modules can be "hot-inserted" and removed without disrupting the interface modules and associated cabling.

There are some application modules that have more than one rear interface (i.e., Octal Voice). This enables different connector schemes to be supported.

All application modules have front viewable LED indicators for status and diagnostic purposes.

Refer to chapters 11 through 22 for more information about each module set.

Chapter 11: Quad DS-1 Module set contains 4 DS-1 links, a microprocessor, and FLASH memory for program storage. It also supports ESF, D4 framing AMI, and B8ZS Line Coding.

Chapter 12: Quad High Speed Data Module set supports 4 high-speed synchronous data ports and accommodates data rates from 48 Kbps to 2.048 Mbps. It also contains a microprocessor and FLASH memory for program storage.

Chapter 13: DS-3 Module set supports 28 T-1s via a single DS-3 interface, a microprocessor, and FLASH memory for program storage. It also supports B3ZS Line Coding, M13 or C-bit Parity, full statistical data for the DS-3 link and embedded 28 DS-1 signals.

Chapter 14: Quad OCU-DP Module set contains 4 DDS 4-wire office channel unit ports, a microprocessor, and FLASH memory for program storage. Diagnostics include local, line, and CSU loopbacks, 63, 511 and 2047 test pattern generation and recognition. The OCU-DP Module supports data rates of 56/64 Kbps.

Chapter 15: Quad xDSL Module set contains 4 pairgain compatible DSL links, a microprocessor, and FLASH memory for program storage; the HDSL or SDSL modules fit into the rear interface module in any combination.

Application/Interface Module Sets (Continued)

Chapter 16: Test Access Module (TAM) set provides four independent testers to send DDS latching loopback codes and execute test patterns at Nx56/64 Kbps.

Single keystroke mapping and commands are also available. Optional use the Quad High Speed Data interface module allows for data access from attachment of external equipment.

Chapter 17: Octal T1/E1 Module set supports up to eight T1 or E1 circuits on a single module set. Any port can be configured for either E1 or T1. The Octal T1/E1 module supports A-law to μ -law conversion for gateway applications. Standard T1 or E1 modes of operation are supported along with extensive diagnostic and testing capabilities.

Chapter 18: Octal Voice Module set has eight PCM encoded voice grade channels per module. Three rear interface modules, E&M, FXO, and FXS, are available for use with the Octal Voice Module. Extensive diagnostics include a test tone generator.

Chapter 19: Octal High Speed Data Module set supports eight individual synchronous DCE ports. These ports can be software configured for EIA-232, EIA-422, EIA-530-A, ITU-V.35, and ITU-X.21 interfaces operating at 48 Kbps and Nx56/64 Kbps data rates, with a maximum of 2048 Kbps (except EIA-232) per port. Multiple timing, control signal and diagnostic modes are offered.

Chapter 20: Channelized Router Module set supports a LAN/WAN connection via an integral 12-port hub with up to 32 network time slots channelization for industry standard protocols, including TCP, IP, IPX, and RIP, RIP 2, OSPF, and NAT, and Frame Relay.

Chapter 21: STS-1 Module set supports one STS-1 (Synchronous Transport Speed-Level 1) 51.84 Mbps interface containing 28 virtual tributary (VT) 1.5s per Bellcore GR-253. Supports D4, ESF framing, diagnostics, and performance monitoring.

Chapter 22: Hybrid DS-3 Module set supports a single hybrid DS-3 link (containing a mix of up to 28 DS1s or 21 E1s per ITU G.747) with M13 or C-bit framing plus integral BERT and loopback diagnostics.



NOTE:

If an application module is not present in the equipment chassis you can not access the individual screens associated with it.

Equipment Specifications

Module Sets Table 1-1 describes each of the module sets that the DACS II AX supports.

Table 1-1. Module Sets

Module Set	Interface	Description
DS-3	ANSI T1.404 ANSI T1X1.107a (2 x BNC 75ohm)	Supports single DSX-3 link with M13 or C-bit parity framing and B3ZS line coding plus integral BERT and loopback diagnostics. Redundancy supported for this module type.
Hybrid DS-3	ANSI T1.404 ANSI T1X1.107a (2 x BNC 75ohm)	Supports single DSX-3 link with M13 or C-bit parity framing and B3ZS line coding plus integral BERT and loopback diagnostics. Redundancy supported for this module type.
STS-1	ANSI T1.404 ANSI T1X1.107a (2 x BNC 75ohm)	Supports one STS-1 (Synchronous Transport Speed-Level 1) 51.84 Mbps. Redundancy supported for this module type.
Octal T1/E1	ANSI T1.403 AT&T 62411 AT&T 54016 ITU-G.703 ITU-G.704 (1 x RJ-48M)	Supports eight DS-1 or E-1 links, in any combination, with D4, ESF or G.70x framing and AMI, B8ZS or HDB3 line coding plus integral BERT and loopback diagnostics. T1/E1 voice encoding and signaling bit conversion included. Redundancy supported for this module type.
Quad xDSL	PairGain HDSL Daughter Board (4 x single UTP) PairGain SDSL Daughter Board (4 x dual UTPs)	Supports four PairGain-compatible HDSL (or combination of HDSL and SDSL) links at 1.544 Mbps via 2 pairs (12 kft @ 24 AWG). Supports four PairGain-compatible SDSL (or combination of SDSL and HDSL) links at 768 Kbps via single pair (12 kft @ 24 AWG).

Table 1-1. Module Sets (Continued)

Module Set	Interface	Description
Octal High Speed Data	EIA-232 EIA-422 EIA-530 EIA-530-A ITU-V.35 ITU-X.21 (8 x DB-26)	Supports eight synchronous DCE ports operating at 48 and Nx56/64 Kbps data rates with a maximum speed of 2.048 Mbps (except EIA-232) plus integral BERT and loopback diagnostics.
Quad OCU-DP	AT&T 62310 Bellcore TA-77 Bellcore TA-83 (4 x RJ-45)	Supports four 4-wire digital lines operating at 56/64 Kbps data rates plus integral BERT and local and remote loopback diagnostics.
Test Access	EIA-232 EIA-530 ITU-V.35 (4 x DB-25)	Supports four independent DS-0 level (Nx56/64 Kbps) enhanced BERT and Local and remote loopback diagnostics.
Channelized Router	10BaseT Ethernet (12 x RJ-45 Hub)	Supports single LAN/WAN connection via 12-port hub with up to 32 network time slots channelization for industry standard protocols including TCP, IP, IPX, and RIP, RIP 2, OSPF and NAT, and Frame Relay.
Quad High Speed Data (HSD)	EIA-232 EIA-422 EIA-530 ITU-V.35 (4 x DB-25)	Supports four synchronous DCE ports operating at 48 and Nx56/64kbps data rates with a maximum speed of 2.048Mbps (Except EIA-232) plus integral BERT & loopback diagnostics.
Quad DS1	ANSI T1.403 AT&T 62411 AT&T 54016 (4 x RJ-48C)	Supports four DS-1 links with D4 or ESF framing and AMI or B8ZS line coding plus integral BERT & loopback diagnostics.

Table 1-1. Module Sets (Continued)

Module Set	Interface	Description
Octal Voice	E&M Type I/II/TO (2 x 50 Pin Telco)	Supports eight 4-wire PCM voice lines employing E&M Type I, II or TO signaling, in any combination, plus integral tone and loop-back diagnostics.
	FXS Ground/Loop (2 x 50 Pin Telco)	Supports eight 2-wire PCM voice lines employing FXS ground or loop signaling, in any combination, plus an integral tone and loop-back diagnostics.
	FXO Ground/Loop (2 x 50 Pin Telco)	Supports eight 2-wire PCM voice lines employing FXO ground or loop signaling, in any combination, plus integral tone and loop-back diagnostics.
SMC I	DB-15 (AUI Port) RJ 48 (10 Base T) RJ 11 (Terminal Port) RJ 11 (Modem Interface)	System controller for the DACS II AX that provides Ethernet AUI and 10 Base T connection acts as an on-line or redundant manager, flash memory, SNMP, telnet and TFTP support.
SMC II	RJ 4 (HS Modem) RJ 11(Terminal Port) RJ 45 (10 Base T) 9 position terminal block (Dry contact closure alarms) 2 position terminal block (Bits Clock) DB-9 Shielded (N+1 Protection Switch)	System controller for the DACS II AX that provides enhanced processing capability, Stratum 3 timing reference, 64kbps BITS composite clock inputs, contract closures and N+1 protection switch control.

DACS II AX Units Table 1-2 summarizes the attributes of the DACS II AX units.

Table 1-2. DACS II AX Units

Attribute	DACS II AX 11	DACS II AX 4
Cross-Connect Capacity	Non-Blocking 256 Mbps TDM Buss 168 Equivalent DS-1s (or 6 DS-3s) Next Gen Buss (future)	Non-Blocking 256 Mbps TDM Buss 168 Equivalent DS-1s Next Gen Buss (future)
System Chassis/Enclosure	6 RU 19/23" flush or 23" center mount 10.5" H x 17" W x 14" D; 25 pounds	3 RU desktop or 19" flush mount 5.25" H x 12" W x 14" D; 14 pounds
Power Supply Options	Redundant or Non-Redundant Module 90-230Vac (47-63 Hz) or -48Vdc 200 Watts	Non-Redundant Integral Supply 90-230Vac (47-63 Hz), 24 or -48Vdc 70 Watts
Talk Battery	-48Vdc 140 Watts	-48Vdc 52 Watts
System Manager Options	Redundant or Non-Redundant	Redundant or Non-Redundant
Application Slot Capacity	11 front and rear mid-plane module sets	4 front and rear mid-plane module sets
Operating Environment	0 ° C (32° F) - 50° C (122° F) Temperature 0% to 90% Humidity (non-condensing)	0 ° C (32° F) - 50° C (122° F) Temperature 0% to 90% Humidity (non-condensing)
System-Level Approvals *	NEBS (Level 3), CE, UL, CUL, and FCC	CE, UL, CUL, and FCC
Module-Level Approvals *	NEBS (Level 3), CE, UL, CUL, and FCC	NEBS (Level 3), CE, UL, CUL, and FCC
* For details, consult Lucent Technologies representative.		

Table 1-2. DACS II AX Units (Continued)

Attribute	DACS II AX 11	DACS II AX 4
N+1	Certifications - FCC Part 15 and Part 68, IC, UL1950, IC CS03, IC-003, EN60950, EN55022, EN50082, NEB/L3, CTR 12/13, CB Scheme -48 VDC +/- 10%. Max. W, 1.2 A 0 ° C (32° F) - 50° C (122° F) Temperature 0% to 90% Humidity (non-condensing)	Not Applicable (N/A)

Fuse Requirements

Table 1-3 summarizes fuse requirements for the DACS II AX.

Table 1-3. Fuse Requirements

Component	DACS II AX 11	DACS II AX 4
DC Power Module	10 Amp, 250 V	10 Amp, 250 V
N+1 Protection Switch DC Power Module	2 Amp, 250 V	Not Applicable
AC Power Connector	5 Amp, 250 V	2 Amp, 250 V
Talk Battery Fuse	7 Amp, 250 V	5 Amp, 250 V

Technical Support

Telephone Numbers

Lucent Technologies provides technical assistance 7 days a week, 24 hours a day.

For technical assistance within the United States, call: **Lucent Technologies North American Regional Technical Assistance Center 1-800-225-7822.**

For technical assistance in Europe, call: **Netherlands Technical Support Organization (TSO) 31-35-687-1555.**

For technical assistance in the Far East, call: **Singapore Technical Support Organization (TSO) 65-241-0880.**

For technical assistance in the United Kingdom, call: **UK Technical Support Organization (TSO) 44-1-793-77-6737.**

For technical assistance in Mexico, call: **Lucent Technologies de Mexico Local Field Support Organization at 91-800-LUCENT or 01-800-70-LUCENT.**

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Background

This chapter provides instructions for installing a DACS II AX, power supplies, system manager, interface and application module sets, and the N+1 Protection Switch. In addition, instructions for logging into the DACS II AX are also furnished.

Site Preparations

Equipment Inspection

**WARNING:**

The DACS II AX system components contain electrostatic-sensitive circuits. Before handling components, put on an anti-static wrist strap connected to frame ground to prevent damage to circuits from electrostatic discharge.

Equipment is shipped in cardboard cartons with foam inserts to protect the units from shock and vibration during shipment. When you receive the DACS II AX, do the following:

- Inspect the condition of all boxes.
- Compare all items to the packing list.
- Notify Lucent Technologies and the carrier immediately if there are any damages or shortages.
- Store the cartons and packing material in case the unit has to be transported at a later date.

Transmission Equipment

Before you install the DACS II AX, contact your service provider to ensure that the proper transmission equipment and lines are installed. For LAN-based network management applications, the site must have at least one AUI (SMC I only) or 10BaseT Ethernet network in place. Depending upon the application being supported, you may also need dial-in telephone lines.

Required Tools and Supplies

You will need the following supplies:

- A Phillips screwdriver to secure shelves to the equipment rack.
 - A standard screwdriver to secure retaining screws on the module into the DACS II AX.
-

Rack Mounting Procedures

DACS II AX-11 Flush Mounted into a 19" Rack (standard)

Incorporated into the design of the DACS II AX-11 chassis are mounting brackets which allow the DACS II AX to be mounted to a standard E.I.A. 19-inch equipment rack.

1. Line up the mounting brackets on the DACS II AX-11 unit with the 19-inch equipment rack.
2. Slide the DACS II AX-11 unit into the equipment rack. Refer to Figure 2-1.

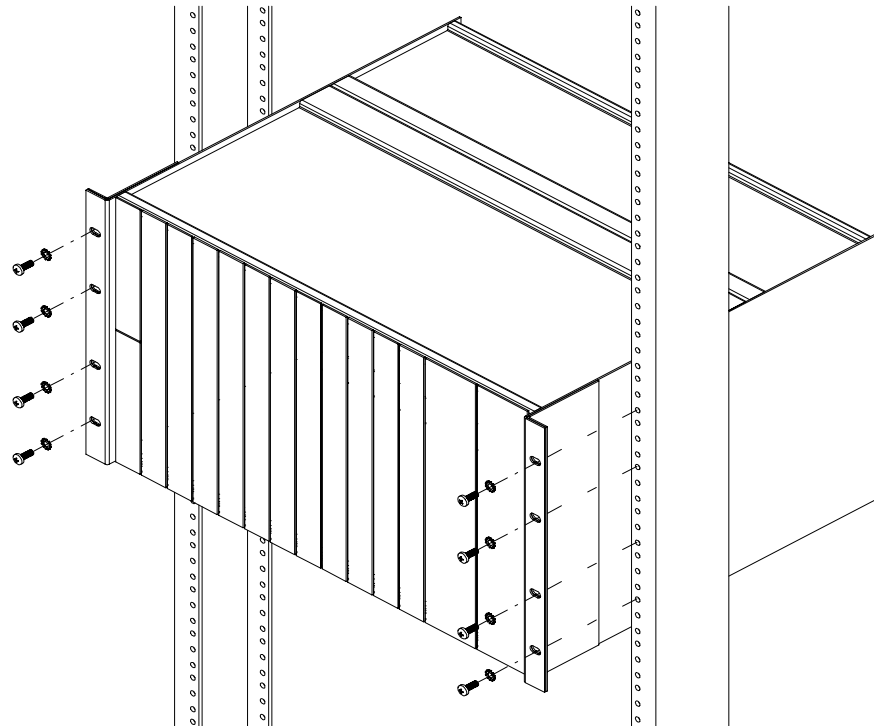


Figure 2-1. DACS II AX-11 Rack Mounting

3. Secure the DACS II AX-11 unit in place using thread-forming screws and a star washer (not provided) placed under each screw head. See Figure 2-5.
-

**DACS II AX-11
Flush Mounted
into a 23" Rack**

1. Orient the flush mounting brackets behind the DACS II AX-11 mounting brackets as shown in Figure 2-2. Align the four small threaded holes of the flush mounting brackets with the DACS II AX-11 mounting brackets.

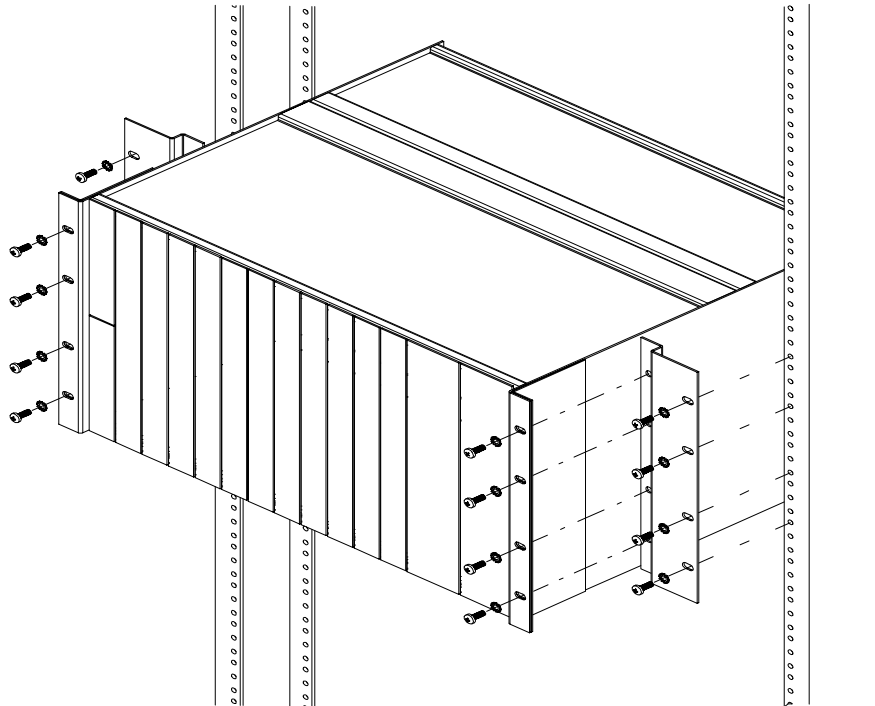


Figure 2-2. DACS II AX-11 Flush Rack Mounting

2. Secure the DACS II AX-11 unit to the flush mounting brackets using #10-32 thread-forming screws and a star washer placed under each screw head. See Figure 2-5.
3. Slide the DACS II AX-11 unit into the equipment rack.
4. Line up the oval holes of the flush mounting brackets with the 23-inch equipment rack.
5. Secure the DACS II AX-11 unit in place using appropriate thread-forming screws and a star washer placed under each screw head. See Figure 2-5.

**DACS II AX-11
Center Mounted
into a 23" Rack**

1. Orient the center mounting brackets behind the DACS II AX-11 mounting brackets as shown in Figure 2-3. Align the four small threaded holes of the center mounting brackets with the DACS II AX-11 mounting brackets.

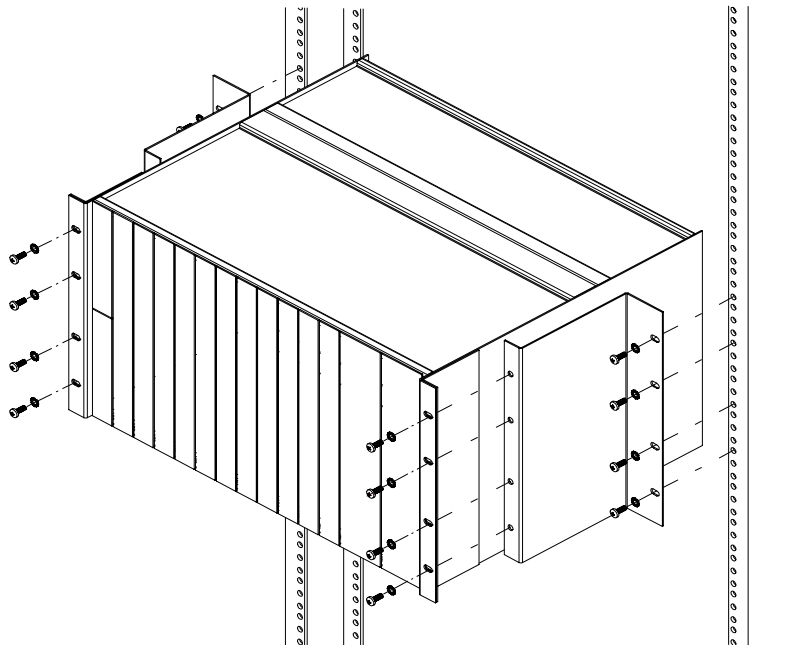


Figure 2-3. DACS II AX-11 Center Rack Mounting

2. Secure the DACS II AX-11 unit to the center mounting brackets using #10-32 thread-forming screws and a star washer placed under each screw head. See Figure 2-5.
3. Slide the DACS II AX-11 unit into the equipment rack.
4. Line up the oval holes of the center mounting brackets with the 23-inch equipment rack.

**NOTE:**

The center, not the front, of the DACS II AX unit will be resting on the equipment rack.

5. Secure the DACS II AX-11 unit in place using appropriate thread-forming screws and a star washer placed under each screw head. See Figure 2-5.

**DACS II AX-4 into
a Flush Mounted
19" Rack**

1. Place the rack mounting brackets on the sides of the DACS II AX-4 unit. Align the four small non-threaded holes on the rack mounting brackets with the four small threaded holes on the sides of the DACS II AX-4.
2. Secure the rack mounting brackets to the DACS II AX-4 unit using the #4-40 screws supplied.
3. Slide the DACS II AX-4 unit into the equipment rack.

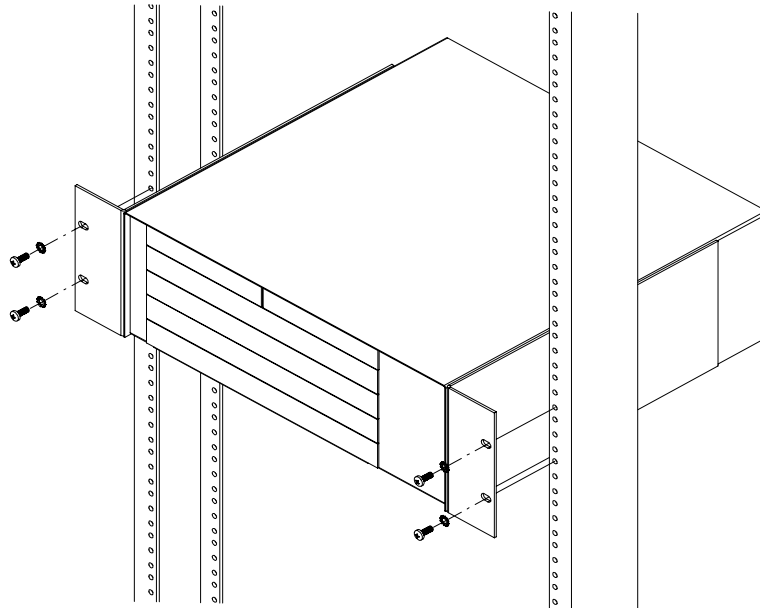


Figure 2-4. DACS II AX-4 Rack Mounting

4. Line up the oval holes of the mounting brackets with the 19-inch equipment rack.
 5. Secure the DACS II AX-4 unit in place using #10-32 thread-forming screws and a star washer placed under each screw head. See Figure 2-5.
-

Proper Grounding

To properly ground the DACS II AX, mount it to the equipment rack using thread-forming screws and a star washer placed under each screw head, as shown in Figure 2-5.

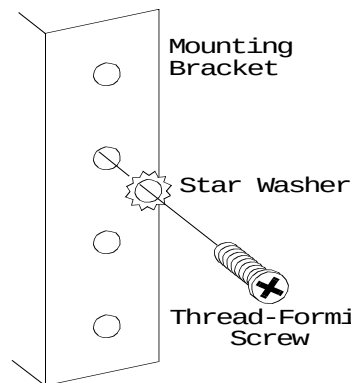


Figure 2-5. Thread-forming Screws and Star Washer Needed for Grounding

Removing Power Supply Module(s)

Power supplies are secured to the DACS II AX chassis by either:

- thumbscrews
- Phillips Head screws

The newer power supply modules can be easily removed from the DACS II AX chassis by loosening the thumbscrews.

The older power supply modules have Phillips Head screws. To remove the screws from the older power supplies:

1. Use a No. 1 Phillips Head screwdriver.
2. Apply firm, even pressure to remove the screws.

If you strip the screws, do not pry them from the chassis. Contact Lucent Technologies technical support.

Installing the Power Supply Module(s)

DACS II AX-11 AC Power

An AC power supply requires an AC power cord with a three-prong grounded plug (see Figure 2-6). This plug must be inserted into a three-prong grounded receptacle. Do not use an adapter to connect these plugs to an ungrounded receptacle.

1. Remove the power module from the anti-static bag.
2. Hold the power supply module upright and slide it into the far right slot in the DACS II AX chassis, following the white card guide.
3. When the power supply module is properly aligned, fasten the screws into the module.
4. An LED on the power supply will illuminate if properly installed and AC power is On.

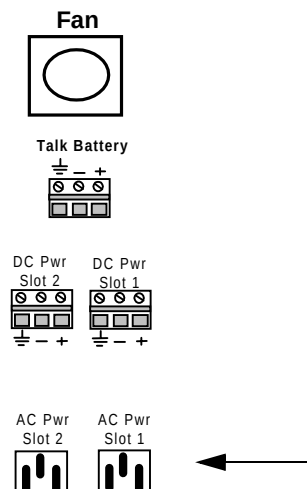


Figure 2-6. AC Power Connection

**DACS II AX-11 DC
Power (48VDC)**

When powering the DACS II AX from -48VDC, use two separate fuse panels or a fuse panel with redundant (A and B) fuse positions.

1. Shut off power to the supply wires.
2. Strip the insulation back approximately 1/4 inch from the end of the wires.
3. Note the positions of earth, negative and positive on the DC power plug.
4. Remove the DC power plug from the mating receptacle on the rear panel. Refer to Figure 2-7.
5. Insert the "earth" wire into the earth terminal and tighten the clamp screw.
6. Insert the "-48 volt supply" wire into the negative terminal and tighten the clamp screw.
7. Insert the "return" wire into the positive terminal and tighten the clamp screw.
8. Insert the plug into the mating receptacle on the rear panel.
9. Power may now be applied to the unit.

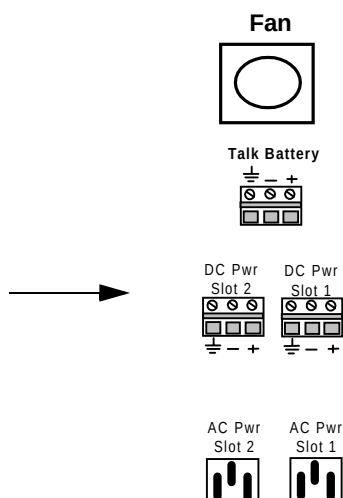


Figure 2-7. DC Power Connection

**DACS II AX-4
AC Power**

An AC power supply requires an AC power cord with a three-prong grounded plug (Figure 2-8). This plug must be inserted into a three prong grounded receptacle. Do not use an adapter to connect these plugs to an ungrounded receptacle.

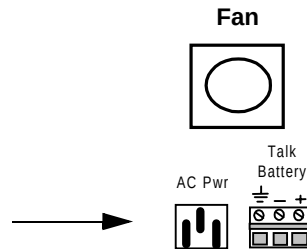


Figure 2-8. DACS II AX-4 AC Power Connection

**DACS II AX-4
DC Power
(24VDC and
48VDC)**

When powering the DACS II AX-4 from -48VDC, use two separate fuse panels or a fuse panel with redundant (A and B) fuse positions.

1. Shut off power to the supply wires.
2. Strip the insulation back approximately 1/4 inch from the end of the wires.
3. Note the positions of earth, negative and positive on the DC power plug.
4. Remove the DC power plug from the mating receptacle on the rear panel. Refer to Figure 2-9.
5. Insert the "earth" wire into the earth terminal and tighten the clamp screw.
6. Insert the "-48 volt supply" wire into the negative terminal and tighten the clamp screw.
7. Insert the "return" wire into the positive terminal and tighten the clamp screw.
8. Insert the plug into the mating receptacle on the rear panel.
9. Power may now be applied to the unit.

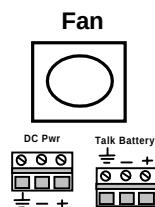


Figure 2-9. DACS II AX-4 DC Power Connection

Connecting the Talk Battery to the DACS II AX (For Octal Voice Module only)

This connection is used exclusively for voice applications using the Octal Voice module.

1. Shut off power to the supply wires.
2. Strip the insulation back approximately 1/4 inch from the end of the wires.
3. Note the positions of earth, negative and positive on the talk battery power plug.
4. Remove the talk battery power plug from the mating receptacle on the rear panel.
5. Insert the "earth" wire into the earth terminal and tighten the clamp screw.
6. Insert the "-48 volt supply" wire into the negative terminal and tighten the clamp screw.
7. Insert the "return" wire into the positive terminal and tighten the clamp screw.
8. Insert the plug into the mating receptacle on the rear panel.
9. Power may now be applied to the unit.

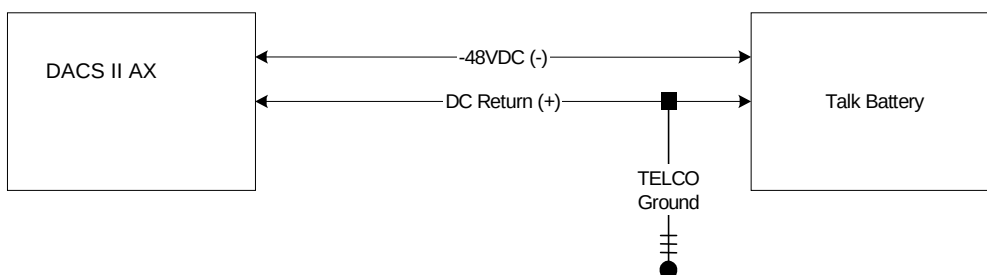


Figure 2-10. Talk Battery Connections

DC Return should be tied to the service provider for the FXO/FXS Ground Start operations to work properly.

Installing the System Manager Controller Modules (SMC I)

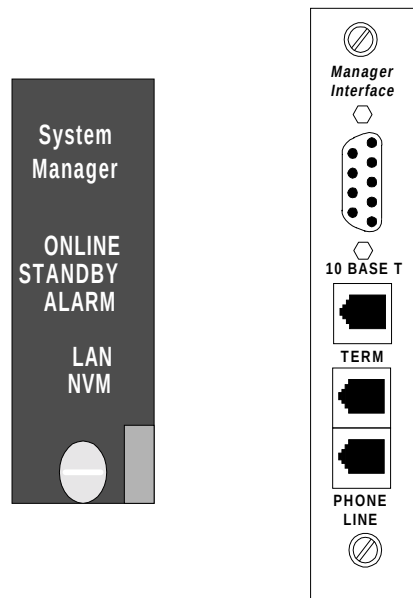


Figure 2-11. SMC I Front and Rear Half-size Boards

**Procedure - Install
SMC I
(DACS II AX-11)**

To install an SMC I module into a DACS II AX-11 chassis:

1. Remove the SMC I module and corresponding SMC I rear interface module from the anti-static bags.
 2. Hold the front SMC I module upright (vertically) and slide it into a slot (far left) in the DACS II AX-11 chassis following the white card guide. It does not matter if you insert the card in the top or bottom slot.
 3. Next, hold the SMC I rear interface module upright and slide it into the rear (far right side) of the DACS II AX chassis following the white card guide. Make sure it is aligned with the front SMC I module.
 4. When both cards are aligned and inserted properly, fasten the thumb screws securely in both front and rear cards. If done properly, the DACS II AX will reset.
-

**Procedure - Install
SMC I
(DACS II AX-4)**

To install an SMC I module into a DACS II AX-4 chassis:

1. Remove the SMC I module and corresponding SMC I rear interface module from the anti-static bags.
 2. Hold the front SMC I module horizontally (component side up) and slide it into a slot in the DACS II AX-4 chassis following the white card guide. If inserted properly, the female connector on the SMC I will meet with the male connector on the DACS II AX-4 backplane. It does not matter if you insert the module in the left or right slot.
 3. Next, hold the SMC I rear interface module horizontally (component side up) and slide it into the rear of the DACS II AX chassis following the white card guide. Make sure it is aligned with the front SMC I module. Again, If inserted properly, the female connector on the SMC I will meet with the male connector on the DACS II AX-4 backplane.
 4. When both cards are aligned and inserted properly, fasten the thumb screws securely in both front and rear cards. If done properly, the DACS II AX will reset.
-

Installing the System Manager Controller Modules (SMC II)

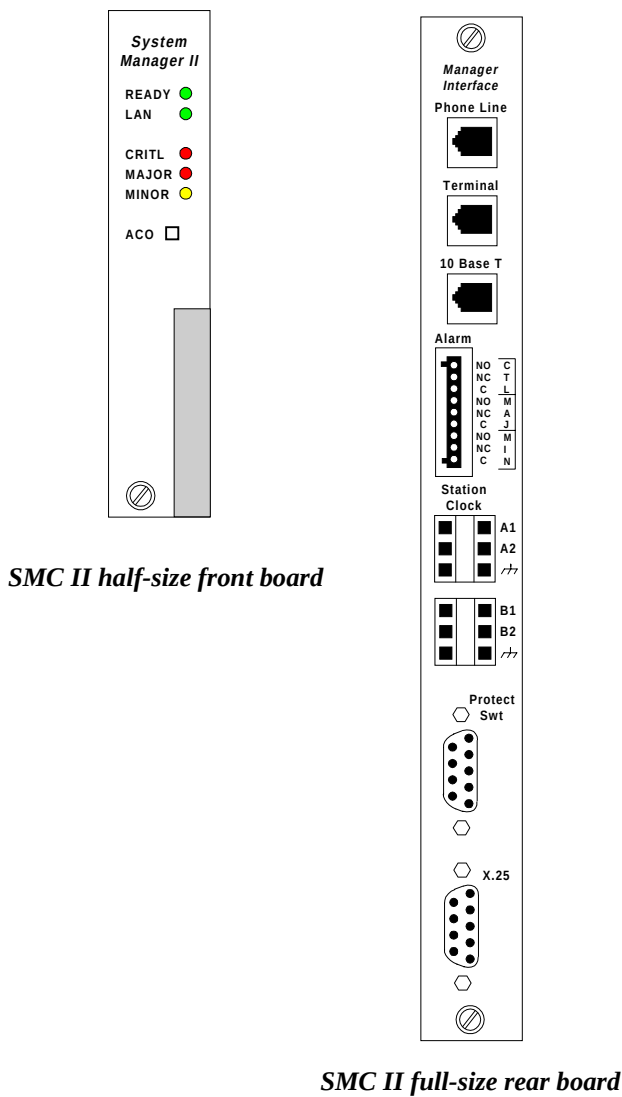


Figure 2-12. SMC II Front and Rear Boards

NOTE:
Procedures for upgrading from SMC I to SMC II are in Chapter 3.

**Procedure - Install
SMC II (DACS II
AX-11)**

To install an SMC II module into a DACS II AX-11 chassis:

1. Remove the SMC II module and corresponding SMC II rear interface module from the anti-static bags.
 2. Hold the front SMC II module upright (vertically) and slide it into a slot (far left) in the DACS II AX-11 chassis following the white card guide. It does not matter if you insert the card in the top or bottom slot.
 3. Next, hold the full-size SMC II rear interface module upright and slide it into the rear of the DACS II AX-11 chassis following the white card guide (far right). Make sure it is aligned with the front SMC II module.
 4. When both cards are aligned and inserted properly, fasten the thumb screws securely in both front and rear cards. If done properly, the DACS II AX will reset.
-

**Procedure - Install
SMC II
(DACS II AX-4)**

To install an SMC II module into a DACS II AX-4 chassis:

1. Remove the SMC II module and corresponding SMC II full-size rear interface module from the anti-static bags.
 2. Hold the front SMC II module horizontally (component side up) and slide it into a slot in the DACS II AX-4 chassis following the white card guide. If inserted properly, the female connector on the SMC II will meet with the male connector on the DACS II AX-4 backplane. It does not matter if you insert the module in the left or right slot.
 3. Next, hold the full-size SMC II rear interface module horizontally (component side up) and slide it into the rear of the DACS II AX-4 chassis following the white card guide. Make sure it is aligned with the front SMC II module. Again, If inserted properly, the female connector on the SMC II will meet with the male connector on the DACS II AX-4 backplane.
 4. When both cards are aligned and inserted properly, fasten the thumb screws securely in both front and rear cards. If done properly, the DACS II AX will reset.
-

Installing the Application and Interface Modules



Figure 2-13. DACS II AX-11 and Application Module

Installing the Application and Interface Modules (Continued)

Install Application Module

To install an application module into a DACS II AX-11 or DACS II AX-4 chassis:

1. Remove the application module and corresponding rear interface card from the anti-static bags.
 2. Hold the front application module upright (for a DACS II AX-11 chassis) and horizontally with the component side up (for a DACS II AX-4 chassis) slide it into a slot in the DACS II AX chassis following the white card guide.
 3. Next, hold the rear interface card upright (for a DACS II AX-11 chassis) and horizontally with the component side up (for a DACS II AX-4 chassis) and slide it into the rear of the DACS II AX chassis following the white card guide. Make sure it is aligned with the front application module.
 4. When both cards are aligned and inserted properly fasten, the thumb screws securely in both front and rear cards. If done properly, the DACS II AX will reset.
-

Installing the N+1 Protection Switch



Figure 2-14. N+1 Protection Switch (rear view)

Before You Begin

Make sure you leave enough space above the DACS II AX unit for the N+1 Protection Switch to reside, approximately 3U high.

Procedure - Install N+1 Protection Switch

To install the N+1 Protection Switch in

1. Place the N+1 Protection Switch on top of the DACS II AX-11.
2. Secure the N+1 Protection Switch to the rack using flush-mount or center-mount mounting plates.
3. Insert all primary and redundant cards in the N + 1 Protection Switch. The Primary Interface Cards have a one-to-one correspondence with the Interface Cards in the DACS II AX 11.
 - N+1 Protection Switch Controller Card
 - Slot 1: Narrowband (Octal T1/E1) Redundant Card
 - Slots 2-11: Narrowband (Octal T1/E1) Primary Card
 - Slot 11: Broadband (DS-3 or STS-1) Redundant Card
 - Slots 8-10: Broadband (DS-3 or STS-1) Primary Card



NOTE:

An N+1 Protection Switch cannot be used to protect DS-3 and STS-1 modules at the same time.

Installing the N+1 Protection Switch (Continued)

For Octal T1/E1 Connections

1. Remove the 50-pin cable from the rear of the Octal T1/E1 card and attach it to the associated Primary Narrowband card.
 2. Connect the 50-pin cable from the Narrowband Primary card to the corresponding 50-pin connector that is on the Octal T1/E1 rear Interface Card.
 3. Attach the 50-pin male-to-male cable from the Narrowband Redundant card to the Standby slot 1 on the DACS II AX-11.
-

For Broadband Connections (DS-3, HybridDS-3, or STS-1)

1. Remove the Tx BNC cable from the rear of the Primary Broadband Interface Card.
2. Connect the Tx BNC cable to the input side of the Broadband Primary Card of the N+1 Protection Switch.
3. Remove Rx BNC cable from the rear of the Primary Broadband Interface Card.
4. Connect the Rx BNC cable to the input side of the Broadband Primary Card of the N+1 Protection Switch.
5. Locate one of the BNC attachment cables.
6. Connect this cable to the Tx output of the Broadband Primary Interface Card.
7. Attach it to the Rx of the Broadband Primary rear Interface Card in the DACS II AX-11.
8. Locate a second BNC attachment cable.
9. Connect this cable to the Rx output of the Broadband Primary Interface Card.
10. Attach it to the Tx of the Broadband Primary rear Interface Card in the DACS II AX-11.
11. Locate the third BNC attachment cable.
12. Connect it to the BNC connector of the Tx Broadband Redundant Interface Card located in the N+1 Protection Switch.
13. Attach the opposite end to the Rx BNC connector of the Broadband Redundant rear interface card in Slot 11 of the DACS II AX.

Installing the N+1 Protection Switch (Continued)

**For Broadband
Connections
(DS-3,
Hybrid DS-3, or
STS-1)
(Continued)**

14. Locate the fourth BNC attachment cable.
 15. Connect it to the BNC connector of the Rx Broadband Redundant Interface card located in the N+1 Protection Switch.
 16. Attach the opposite end to the Tx BNC connector of the Broadband Redundant rear Interface card in Slot 11 of the DACS II AX.
-

Connecting the Protection Switch Controller Card

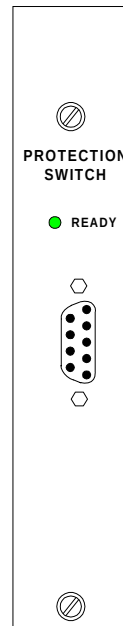


Figure 2-15. N+1 Protection Switch Controller Card

1. Connect the DB9 male-to-male Serial Interface Cable to the DB9 connector on the Controller Card.
2. Connect the opposite end to the DB9 connector located on the SMC II Rear Interface Card, marked "**Protect Swt.,**" see Figure 2-15.
3. Power up both the DACS II AX-11 and N+1 Protection Switch.
4. You will see a flashing green *READY* LED on the N+1 Protection Switch Controller Card; a solid green *READY* LED on the Online SMC II; and a flashing green *READY* LED on the Standby SMC II.



NOTE:
Ignore any alarms at this point.

Console Access

Use the console to configure the interface protocol and parameters for each device port, monitor the network, and perform diagnostics. A console may be a pc, workstation or a dedicated terminal. Access to the console is password-protected after you establish a login and password.

Connecting the Console

The necessary cable that attaches to the connectors should be installed at your site. For pin assignments and descriptions of these interfaces, refer to Appendix B, Cables and Interfaces.

Connect a console to the DACS II AX in any of the following three ways:

- Telnet access from a PC or workstation via an Ethernet LAN. (Available after installation only.)
- Dial call to the DACS II AX's modem port from any PC or workstation on the network.
- Dedicated terminal connected to the DACS II AX's console port.

Locate the DACS II AX System Manager Interface on the rear of the chassis, then refer to the following table.

<i>If</i>	<i>Then</i>
an asynchronous terminal (or pc with VT-100 emulation) will be directly connected to the DACS II AX ...	... locate the RJ-11 craft interface connector labeled TERM. Attach your terminal to this connector.
a PC or workstation in the network will dial in to the DACS II AX ...	... locate the RJ-11 telco connector labeled PHONE LINE. Insert a phone line in this connector. The DACS II AX has a built-in modem.
a PC or workstation in the network will use an Ethernet cable to connect to the DACS II AX ...	... connect the LAN using the AUI (for SMC I only) or 10BaseT Ethernet connector on the DACS II AX System Manager interface. The Administrator establishes a telnet session to connect to the DACS II AX.

Administrative Access (Continued)

Terminal Communications Parameters

Configure your terminal communications parameters as follows:

- Data Rate: 1200, 2400, 4800, 9600 or 19200 bps (9600 recommended)
- Data Bits: 8
- Stop Bit: 1
- Parity: None
- Flow Control: None



NOTE:

Some terminal manufacturers might identify the data bit configuration as 7-N-1 (seven data bits plus a "not used" parity bit) while other manufacturers might identify the same configurations 8-N-1 (eight bits including a "not used" parity bit). Check the terminal's user manual.

Logging into the DACS II AX

To log in to the DACS II AX, dial in, telnet in, or connect with a dedicated terminal, then:

1. Press **<Enter>** on your terminal keyboard to activate automatic baud rate recognition (ABR).
2. Enter your login name and password. To use the default login name and password, press **<Enter>** for each entry.

**NOTE:**

Users are set up from the User Menu. The first user added, must be assigned an Admin user level. Once a user has been established from the User Menu, the default login (**Enter**) is no longer valid. For details, refer to Chapter 4.

3. If the DACS II AX System Manager cannot automatically detect your terminal type, the Terminal Selection Menu displays. Select your terminal type from the list. When you have logged in and the DACS II AX has determined the terminal type, the DACS II AX Main Menu displays.

```
login:
password:

WELCOME ..
Mon, Jul 31, 2000 10:22:32 pm
Software X.XXX, Hardware 0.00s: X.X
```

Terminal types supported:

(1) ADDS Regent 25	(11) Hazeltine 1500
(2) ADDS Viewpoint	(12) IBM 3101
(3) Attis 4410/4425	(13) ICL 6401
(4) Data General DASHER	(14) LSI ADM 11/31
(5) Datamedia 1521	(15) Paradyne 7811
(6) Datamedia EXCEL 30	(16) Qume QVT-101/102/108
(7) Datamedia EXCEL 42	(17) Teletype 5410/5425
(8) DEC VT-52	(18) Televideo 900
(9) DEC VT-100/131/220	(19) Wyse WY-50
(10) Freedom 100	(20) Wyse WY-75

Enter your terminal type [1...20]...

Figure 2-16. Terminal Selection Type

Verifying N+1 Protection Switch Installation

To ensure the N+1 Protection Switch has been properly installed, verify the Card Status is *Ok* and the Switch State's condition is *Normal*. To do this, go to the *Node Summary Menu* and view the N+1 Protection Switch's Status Menu. It should look similar to the one shown in Figure 2-17. For information on menu navigation, refer to the following section.

```
Lucent Technologies          DACS II AX - Protection Switch          Help = [?]

                                Status Menu
                                -----

Slot#   Card Type           Card Status   Switch State   Switch Status
-----
01      T1/E1 Secondary     Ok            Normal         Ok
02      T1/E1 Primary       Ok            Normal         Ok
03      T1/E1 Primary       Ok            Normal         Ok
04      T1/E1 Primary       Ok            Normal         Ok
05      T1/E1 Primary       Ok            Normal         Ok
06      T1/E1 Primary       Ok            Normal         Ok
07      T1/E1 Primary       Ok            Normal         Ok
08      T1/E1 Primary       Ok            Normal         Ok
09      T1/E1 Primary       Ok            Normal         Ok
10      T3 Primary          Ok            Normal         Ok
11      T3 Secondary        Ok            Normal         Ok

Power Supply A Status.: Ok      Fan Maintenance: Medium  Fan #01: Ok
Power Supply B Status.: Ok      Fan Speed.....: Medium  Fan #02: Ok
Chassis Temperature...: 110 F/43 C      Fan #03: Ok
```

Figure 2-17. N+1 Protection Switch Status Menu

Menu Navigation

The DACS II AX user interface has two types of screens:

- **Menus** - choose a menu item, return to a previous menu or select a command listed at the bottom of the screen.
- **Menus with fields** - enter information.

Two types of fields appear on DACS II AX menus:

- **Option fields** - These fields contain a list of the valid entries. In these fields, scroll through the options until the option you want appears on the screen, then move to the next field.
- **Text fields** - These fields require you to type in an entry, then move to the next field.

Action	Key
Move to the next field	SPACEBAR or DOWN arrow
Move to the previous field	BACKSPACE or UP arrow
<i>Options Fields:</i> Scroll to the next option Scroll to the previous option	Enter B
<i>Text Fields:</i> Enter text; and clear changes and revert to last saved entry	Press Enter . When the line appears, type the new text, then press Enter again
Erase characters	BACKSPACE or UP arrow
Save changes on screen and exit to previous menu	X then type Y when prompted with "Update Configuration? Are you sure (Y/N)?"
Exit to previous menu without saving changes	Esc , then type Y when prompted with "Abort edits? Are you sure (Y/N)?"
Select the current option	Press Enter
Return to the previous menu	X or Esc
To access the Help screen	Press ? key
Select a command listed at the bottom of the screen type the letter indicated in brackets	type the letter indicated in brackets



NOTE:

To activate the values that you enter or select on the configuration screens, you must exit the screen. Diagnostic parameters are activated immediately, as soon as you change the value on the screen.

Help <?>Menu

For help maneuvering around in the menus, press the ? key on your keyboard from any screen.

```

*****
*                                     *
*               - HELP <?> -         *
*                                     *
* To select any menu or field on any screen, position the cursor *
* on the entry and press <RETURN>.  *
*                                     *
* CURSOR MOVEMENT *
*   Move forward      = <SPACE> / <Down Arrow> *
*   Move backward     = <BACKSPACE> / <Up Arrow> *
*                                     *
* FIELD CHANGE *
*   Options field: Scroll forward = <RETURN> *
*                  Scroll backward = <B> *
*                                     *
*   Text field:   Update entry    = <RETURN> *
*                  Recall last entry = <ESC> *
*                                     *
* SCREEN EXIT *
*   Save any changes      = <X> *
*   Abort all changes     = <ESC> *
*                                     *
*               - Press any key to exit - *
*                                     *
*****

```

Figure 2-18. The Help Menu

DACS II AX Menu Structure

The console enables access to a hierarchy of menus. This section briefly describes each menu. Figure 2-19 shows the entire menu structure of the DACS II AX user interface.

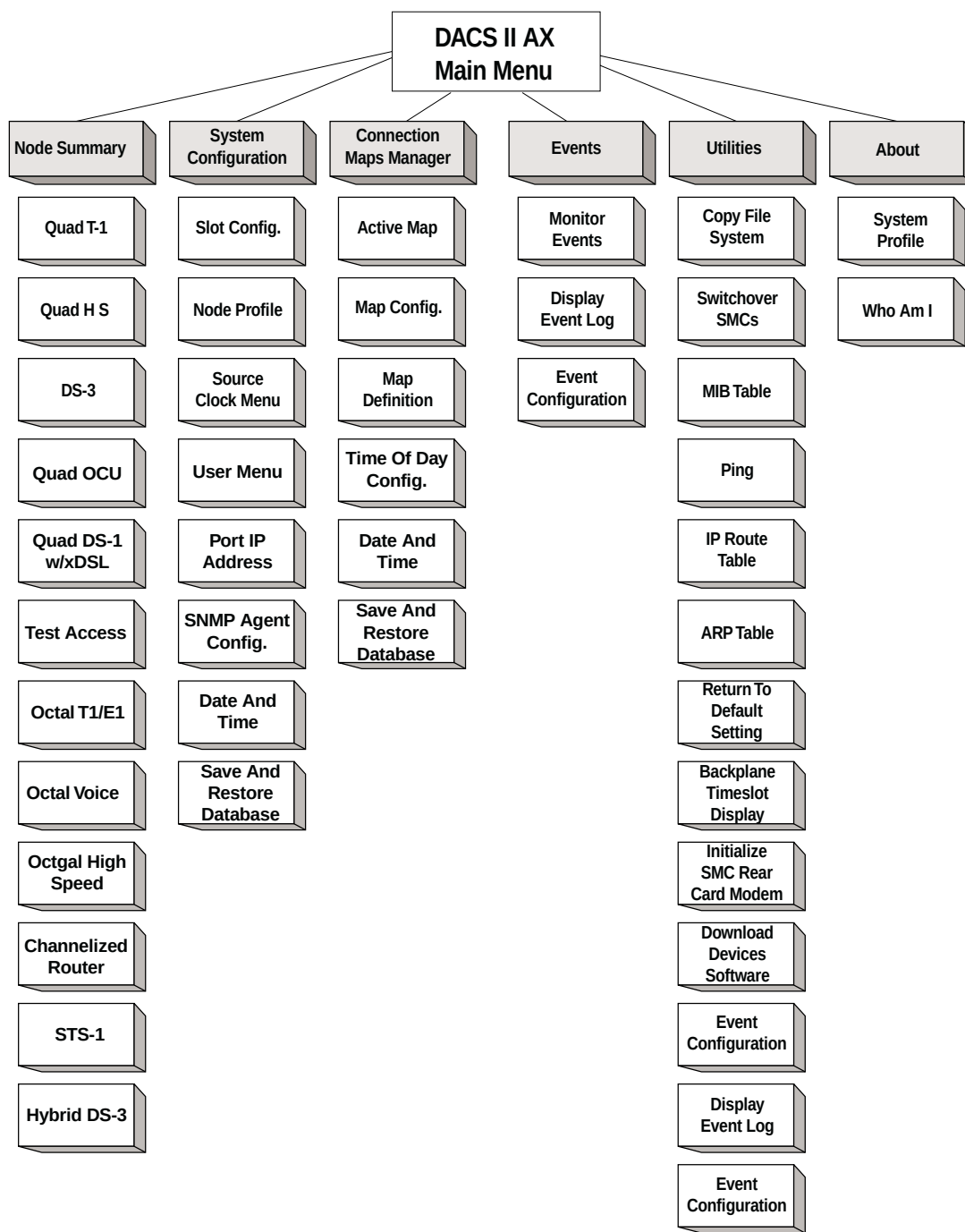


Figure 2-19. DACS II AX Menu Structure

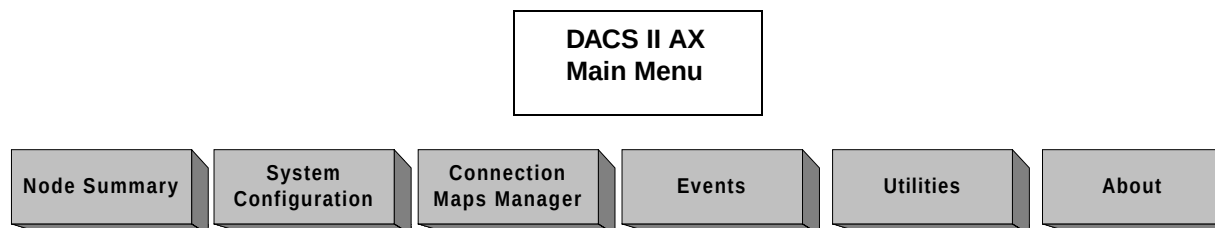


Figure 2-20. Main Menu Structure

The **Main Menu** is the top-level menu. It provides access to the *Node Summary*, *System Configuration*, *Connection Maps Manager*, *Events*, *Utilities*, and *About* sub-menus.

Menu Option	Description
Node Summary	Provides status of each slot and access to the installed modules. Select a slot from Node Summary to configure, run diagnostics, or use utilities for the module in the selected slot. If a module is not in a slot, you can not access the screens associated with it.
System Configuration	Enables you to set system parameters and administer user security levels.
Connection Maps Manager	Provides options for manipulating cross-connection maps.
Events	Allows you to monitor events, display the event log, and send events to a host PC or workstation running syslog.
Utilities	Provides system diagnostics and utilities.
About	Displays a profile of the System Manager Control module and provides an entry for user identification.

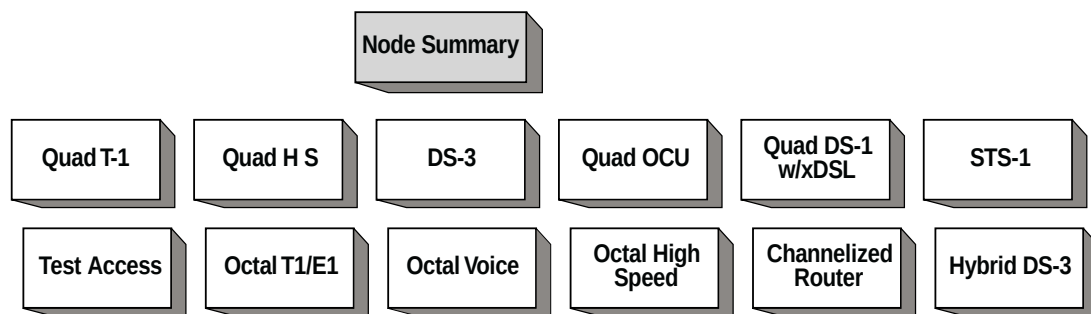


Figure 2-21. Node Summary Menu Structure

The **Node Summary Menu** provides access to the modules *you have selected* for your DACS II AX system (several are shown above). If the module you wish to access is currently installed in the DACS II AX, select it by using the **<Spacebar>** to navigate and then press **<Enter>**.

The Node Summary is described in Chapter 3.

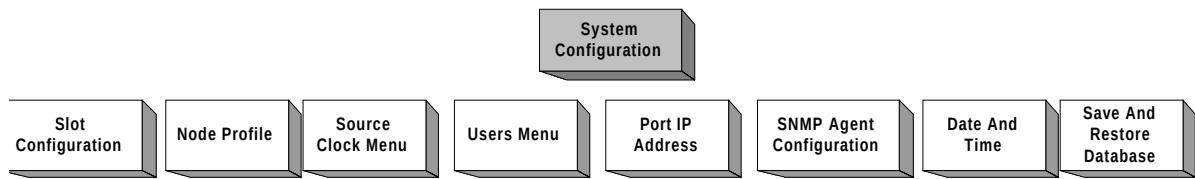


Figure 2-22. System Configuration Menu Structure

The ***System Configuration Menu*** provides access to submenus for configuring slots, the source clock, port IP addresses, SNMP agent and such database management tasks as setting the time, date, node name and password, and saving/restoring a configuration to/from a remote host. The commands and parameters associated with each of the system configuration screens are explained in detail in Chapter 4, System Configuration.

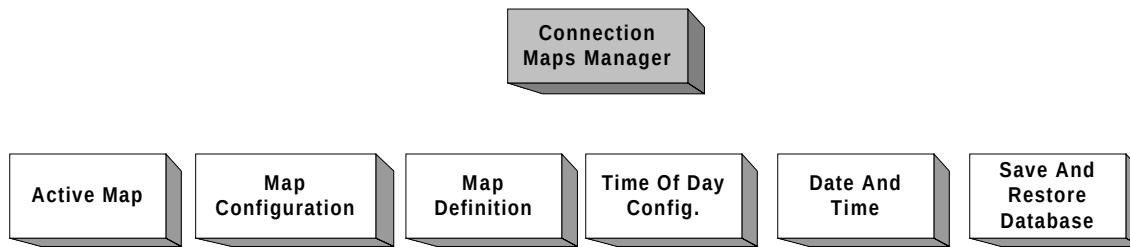


Figure 2-23. Connections Map Manager Menu Structure

The ***Connection Maps Manager*** provides access to submenus for configuring, defining and testing connections as well as establishing time of day map activations. See Chapter 5, Connection Map Configuration.

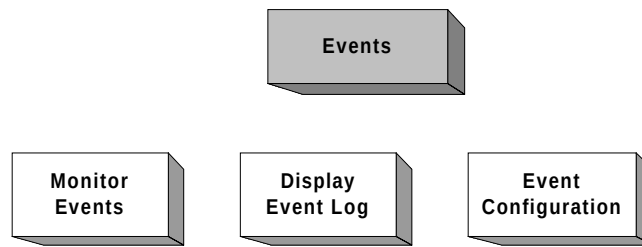


Figure 2-24. Events Menu Structure

The ***Events Menu*** allows you to monitor and display system events. The commands and parameters associated with each of the events screens are explained in detail in Chapter 6.

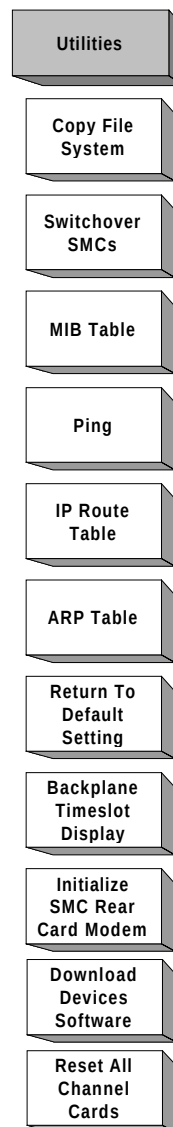


Figure 2-25. Utilities Menu Structure

The **Utilities Menu** allows you to access system routing utilities, copy system files, download software, and return to default settings. The commands and parameters associated with each of the utilities screens are explained in detail in Chapter 7.

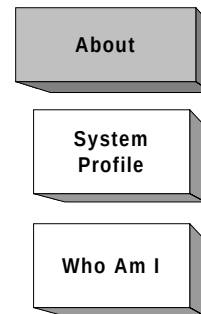


Figure 2-26. About Menu Structure

**Procedure -
Display Personal
Security
Information**

The **About Menu** allows you to retrieve personal security information.

1. From the DACS II AX *Main Menu*, select **About**, then select **Who Am I**.
2. Provide the password for the current session press **<Enter>** and then press **X**. The DACS II AX displays *Name*, *Security level*, and *Security Mask* of the user.



NOTE:

If you enter an invalid password or do not know the current password, an error message appears. Press **<Esc>** twice to return to the *About Menu*.

The Administrator maintains the user information, including adding, changing or deleting users.

Each user can display information for his own login. If a password is forgotten, only the Administrator can change the password.

For more information on security levels, refer to Chapter 4, System Configuration.

Set Up and Maintenance Activities

ACTIVITY	DESCRIPTION	CHAPTER
Define users (optional)	To set up multiple logins to the DACS II AX. Note: <i>Create the system administrator's security level first.</i>	Chapter 4
Check card and slot assignment and redundancy groups.	Ensure that the card is physically present in a slot and matches the type of card for which the slot is configured.	Chapter 3 and Chapter 10
Set system parameters	Configure port IP addresses, SNMP agent, date and time, source clock, and node profile.	Chapter 4
Create and activate maps	You can create up to five cross connection maps. A map can be scheduled to activate or be activated manually.	Chapter 5
Monitor DACS II AX	You can monitor events, review the event log, or log events to syslog on a PC or workstation in the network.	Chapter 6
Perform diagnostics and use utilities when needed	Use the diagnostics and utilities available for the application module. Use the DACS II AX utilities. Note: <i>Only knowledgeable users should access Utilities, since they are service-affecting.</i>	Chapter 7
Back up to host PC or workstation	You can backup the system configuration to a host PC or workstation.	Chapter 4

Node Summary

3

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Terms Used

Broadband Primary Card - this card resides in the N+1 Protection Switch and is used to back up Broadband Application Modules in slot 8, 9 or 10.

Broadband Redundant Card - this card resides in the N+1 Protection Switch and is used to back up Broadband Application Modules; it must reside in slot 11.

Controller Card - provides communications between the DACS II AX's System Manager and the N+1 Protection Switch.

Narrowband Primary Card - this card resides in the N+1 Protection Switch and is used to back up an Octal T1/E1 Application Module in slots 2 through 11.

Narrowband Redundant Card - this card resides in the N+1 Protection Switch and is used to back up an Octal T1/E1 Application Module; it must reside in slot 1.

Primary Device - a device in an redundancy group that would normally carry traffic.

Primary Slots (DACS II AX) - cards plugged into these slots are considered active and online under normal operation.

Primary Slots (N+1 Protection Switch) - holds Interface Cards for the cards plugged into the DACS II AX's primary slots.

Protected Device - this is a primary device that will be replaced by a redundant device should it fail within its redundancy group.

PSX - N+1 Protection Switch

Redundant Device - one device in an redundancy group that has been configured to replace or substitute for a failed primary device in the redundancy group.

Redundancy Group - a collection of configured primary devices and a redundant device that will be used for redundancy.

Restore - an action that occurs when traffic is returned to the primary device that was being protected in the redundancy group by a redundant device.

Standby Slots (DACS II AX) - cards plugged into these slots are considered inactive and offline under normal operation. They become active and go online when a card plugged into the primary slot becomes non-operational.

Standby Slots (N+1 Protection Switch) - holds Interface Cards for the cards plugged into the DACS II AX's standby slots.

Switchover - an action that occurs when a redundant device replaces a primary device that failed.

Node Summary Menu

Functions

The Node Summary menu (Figure 3-1) provides:

- Information about how the slots are configured, the current device state, and alarm status
- Status information for the application modules, the System Manager Controller boards, and the N+1 Protection Switch
- Information on the redundancy state of each module
- Access to the installed modules for port configuration, diagnostics, and redundancy status.
- Access to the N+1 Protection Switch for configuration
- Access to alarm detail
- Actions to clear error counts, manually execute a switchover, and restore a device after a switchover.

```

Lucent Technologies      DACS II AX-11 - System Manager      Help = [?]
Databases: InSync      N+1 Redundancy State: Enabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#  Configured Type  Device State  Alarm
-----
01     + Octal T1/E1    Standby      None
02     + Octal T1/E1    Online       None
03     + Octal T1/E1    Online       None    Clock Src
04     + Octal T1/E1    Online       None
05     + Octal T1/E1    Online       None
06     + Octal T1/E1    Online       None
07     + Octal T1/E1    Online       None
08     Octal T1/E1      Online       None
09     Octal T1/E1      Online       None
10     + T3             Online       None
11     + T3             Standby      None
SMCA    System Manager A Standby      None
SMCB    System Manager B Online        None
PSX     ProtectionSwitch Online        None

[C]lear error counts  [S]lot Cfg      [E]xpose  [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver [R]estore

```

Figure 3-1. Node Summary Menu with the N+1 Protection Switch

Parts of the Node Summary Menu

Configured Device Type

An application module physically resident in a slot in the DACS II AX nest and configured for that slot is a configured device. If the device has been configured properly, it will appear in the *Configured Type* column on the *Node Summary* screen, as shown in Figure 3-1.

If you have the N+1 Protection Switch and your system is properly configured for redundancy, you will see a plus (+) symbol in the *Configured Type* column to distinguish the cards configured as part of an active redundancy group.

To qualify for the (+), the configured device type must be correct, the slot redundancy in the Slot Configuration Menu must be *enabled*, the redundancy group must have a configured and *enabled* redundant device, and the N+1 Protection Switch must be *Online*.

The (-) indicates the card is not just a part of an active redundancy group but that the device has switched over.

Information on how to configure a device in an redundancy group can be found in Chapter 10, *N+1 Protection Switch*.

Device State

The state of a card is indicated in the Device State column. If the card is configured as a **primary device** in an redundancy group, its state can be:

- **Standby** - indicates the device is good and is not running data.
- **Online** - (indicates the device is good and on the bus) a change in configuration is allowed.
- **Offline** - (indicates a general failure and is not running data) a change in configuration is allowed for the purpose of debugging but the redundant device will not get the configuration changes.
- **Defective** - (indicates the device has a general failure and is on the bus) a change in configuration is allowed for the purpose of debugging but the redundant device will not get the configuration changes.
- **Bus Error** - (indicates the device has a bus failure that will impact other buses and is off the bus) a change in configuration is allowed for the purpose of debugging but the redundant device will not get the configuration changes.

Parts of the Node Summary Menu (Continued)

Device State (Continued)

If the Narrowband card in slot 1 or the Broadband card in slot 11 is configured as a **redundant device** in an redundancy group, its state can be:

- **Standby** - (indicates the device is good and is not running data) the device will contain the downloaded configuration from the switched over primary card in an enabled redundancy group.
- **Online** - (indicates the device is good and on the bus) the device uses the configuration as requested by the SMC and is passing traffic for the protected card. All generated events are reported under the slot number of the redundant device. However, the redundant device is not allowed to change port configuration or receive any configuration changes from the protected or primary device.
- **Offline** - (indicates a general failure) a change in configuration is allowed for the purpose of debugging but the restored device will not get the configuration changes.
- **Defective** - (indicates the device has a general failure and is on the bus) a change in configuration is allowed for the purpose of debugging but the restored device will not get the configuration changes.
- **Bus Error** - (indicates the device has a bus failure that will impact other buses and is off the bus) a change in configuration is allowed for the purpose of debugging but the restored device will not get the configuration changes.

Connection maps can be changed regardless of the state of the card.

Parts of the Node Summary Menu (Continued)

Alarms

The Alarm column displayed on this screen indicates an error or problem(s) with the device or port. Alarm conditions are designated as **Critical**, **Major**, and/or **Minor**. To discover specific details about the cause of the alarm, press **[E]**xpose on your keyboard. For details on alarm levels, alarm conditions, and alarm contacts, see *Chapter 9, Alarms*.

In the *Node Summary Menu*, the (*) asterisk is a flag for error conditions such as, Bipolar Violations, CRCs, BERT errors, etc. As long as there are no errors occurring, the (*) can be cleared by pressing "C".

The *Toggle Alarm Contacts* command is useful if you have an external alarm panel that can be physically connected to the SMC rear interface board. If you have an external alarm device, you can enable this feature to invoke an audible or visual (i.e., LED panel) notification should an alarm occur.

Parts of the Node Summary Menu (Continued)

SMCA and SMCB All of the application modules in the DACS II AX chassis are under the control of the DACS II AX online System Manager Card (SMC). There are two versions of the SMC:

- SMC I
- SMC II for use with Release 9.01 and higher. SMC II is required for the N+1 Protection Switch.

For details on the SMC, refer to Chapter 1, Overview.

Both the DACS II AX-11 and the DACS II AX-4 can be equipped with two System Manager Cards. SMC redundancy offers these benefits:

- If the online unit fail, then the standby System Manager is automatically switched in.
- The online SMC automatically copies configuration changes to the standby SMC. Databases are kept in sync. There is also a Copy File System option on the Utilities menu which allows you to copy changes to the standby SMC manually. During scheduled maintenance, you should also switch the SMC boards to make sure the hardware is still functioning properly.

The *Device State* column of the Node Summary Menu indicates the SMC status as *Online*, *Standby* or *Not Present*.

PSX - Protection Switch

The Node Summary Menu provides access to the Protection Switch Main Menu.

From the Protection Switch Main Menu, you can choose options to display status information about the Protection Switch and the protected devices, reset the N+1 Protection Switch Controller Card, and display release and version information.

The Protection Switch is covered in Chapter 10, N+1 Protection Switch.

Replacing SMC I with SMC II - Overview

The SMC I front module and rear interface are each half-height cards. The SMC II front module is a half-height card and the SMC II rear interface is a full-height card, as shown in Figure 3-2. As part of the SMC upgrade procedure, a guide is removed from the SMC rear interface slot to make room for the full-size rear interface.

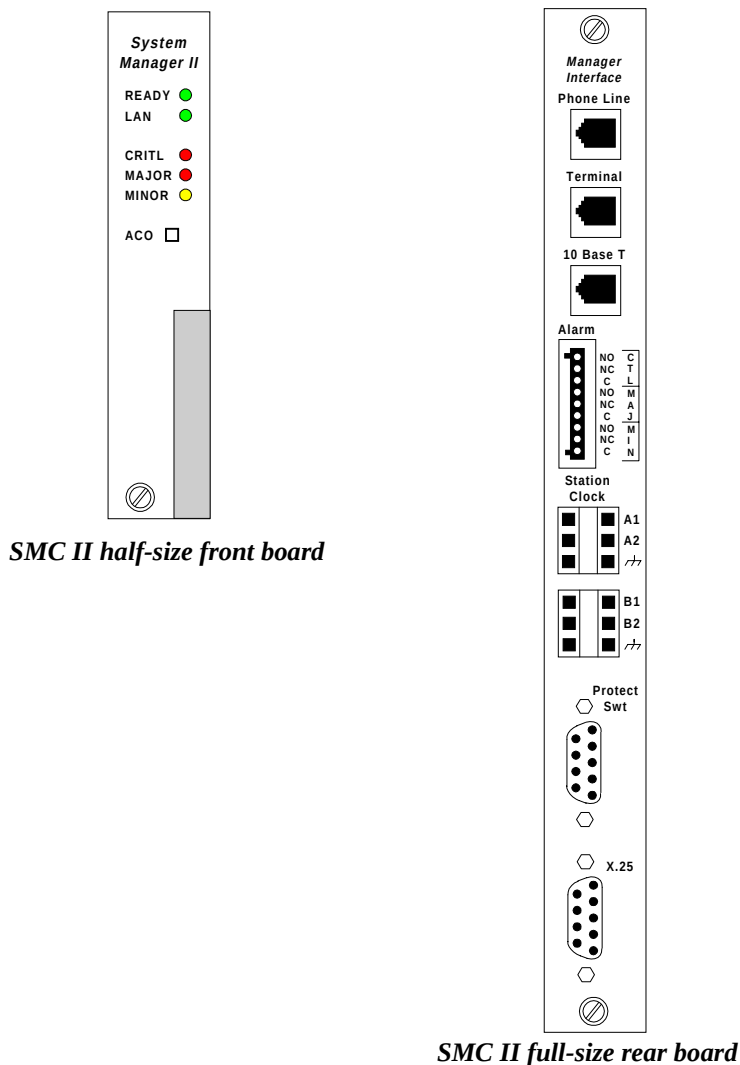


Figure 3-2. SMC II Front and Rear Boards

Bus Speeds

The SMC II has a supervisory bus that runs at 512K bps. The SMC I runs at a lower speed of 19.2K bps.

Application cards currently running at a speed of 19.2K bps on the system management bus, will not recognize the SMC II until they are upgraded or until the speed of the SMC II is downgraded to 19.2K bps.

You can either:

- Downgrade the SMC II speed to 19.2K bps prior to the application card upgrade. To change the SMC II speed, from the DACS II AX main menu, select Utilities, then select Backplane Supervisory Bus. Adjust the speed for BUS B to 19.2K bps.
- Upgrade the application cards with the SMC I, then upgrade to the SMC II. In this section, this method is discussed.

**Downloading
Software to
Application
Modules**

To download software from a host pc, you will need to run a TFTP session. For information, see *Appendix A, TFTP/Telnet*.

Replacing SMC I with SMC II

Purpose

Use this procedure to upgrade from the SMC I to the SMC II.

Before You Begin

The following procedure should be performed during scheduled down time.

Save the current configuration before upgrading your system.

Related Information

Complete upgrade procedures are included in the *DACS II AX, Release 9.02 Software Release Description*. Refer to that document for complete details on software and hardware upgrades.

In this document, see:

- Chapter 7, *Utilities*, for information on copying files.
 - See Chapter 4, *System Configuration* for information on saving configuration information to a PC.
 - See Appendix A, *TFTP/Telnet*, for information on running a TFTP session and downloading software upgrades for the SMC and the application modules.
 - See Appendix C, *Installation and Upgrade Procedures*
-

**Procedure -
Replace SMC
Front Boards**

To replace the SMC I front boards with SMC II front boards:

1. If there is new software for the application modules, download the new software to the application modules. Upon completion, the cards will reset.

**NOTE:**

Before monitoring LEDs, wait approximately 30 seconds while the cards recycle.

2. Remove the *Standby* SMC I front board and insert the SMC II board into the *Standby* slot. If you do not have redundancy, insert the SMC II board in the spare SMC slot.
3. The *Standby* SMC II's READY LED will blink green. The SMC I's ONLINE LED will be solid. **STOP, IF THIS IS NOT THE CASE, AND CALL TECHNICAL SUPPORT!**

Replacing SMC I with SMC II (Continued)

Procedure - Replace SMC Front Boards Continued

4. Log in to the DACS II AX. Copy the configuration from the *Online* SMC I to the *Standby* SMC II using the Copy File System option on the Utilities menu.
 5. Return to the DACS II AX Main Menu and verify that the databases are in sync.
 6. Remove the *Online* SMC I board to force a switchover to the *Standby* SMC II. The SMC II board will now be Online as indicated by a solid green READY LED.
 7. Insert the *Standby* SMC II board, if you have redundancy. The *Standby* SMC II's READY LED will blink green and the Online SMC II's READY LED will be solid. **STOP, IF THIS IS NOT THE CASE, AND CALL TECHNICAL SUPPORT!**
 8. Once the *Standby* SMC II has been installed, copy the configuration to the *Standby* SMC II board using the Copy File System option on the Utilities menu.
 9. Verify at the Node Summary Menu that both SMC boards are in sync (as shown in the Node Summary Menu in Figure 3-1).
-

Procedure - Replace SMC Rear Board (DACS II AX-11)

**WARNING:**

Perform SMC rear card replacement with the DACS II AX fully powered. The system will lose transmission completely, if you power down.

To replace the SMC I *half-height* rear board with the SMC II *full-size* rear board for the DACS II AX-11:

1. Remove all cabling from the SMC Rear Interface Card.
2. Remove the half-height SMC I Rear Interface Card and the blank bezel. Suggestion: remove the card in slot 1 for easier access.

You will now be able to view the guide.

Replacing SMC I with SMC II (Continued)

Procedure - Replace SMC Rear Board (DACS II AX-11) Continued

3. Carefully hold the guide with one hand while removing the two retaining screws from the side of the DACS II AX chassis, refer to Figure 3-3.

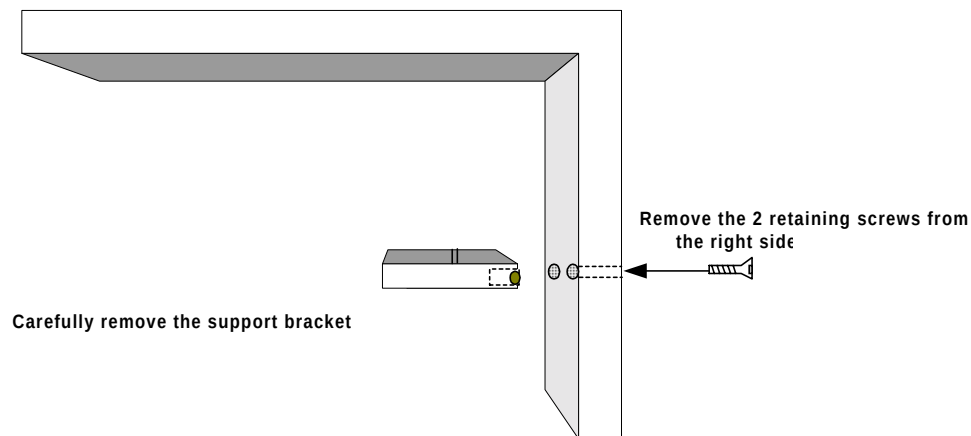


Figure 3-3. Cutaway Rear View of the DACS II AX-11



CAUTION:

Do not insert the full-size SMC II rear interface card into an application module slot in the 11-slot chassis. The module will be damaged.

4. Insert the new full-size SMC II Rear Interface Card into the back of the 11-slot chassis in the slot at the far right following the white card guide. Make sure it is aligned with the front SMC II module.
5. Fasten thumb screws. Unit should reset.
6. Re-attach all SMC Rear Interface cables.

Replacing SMC I with SMC II (Continued)

Procedure - Replace SMC Rear Board (DACS II AX-4)

**WARNING:**

You will need a 1/4-inch open-end wrench to perform this procedure. The DACS II AX-4 backplane pins may be damaged if you do not use the proper tool.

To install an SMC II rear interface into a 4-slot chassis:

1. Remove all DACS II AX-4 rear cards.
2. Locate the hex nut closest to the back of the DACS II AX-4. It is hidden behind the support bracket. See Figure 3-4.
3. Remove the hex nut with the wrench.
4. Lift the support bracket to free it from the screw.
5. Turn the support bracket to expose the inner hex nut.
6. Remove the inner hex nut.
7. Remove the support bracket.

**NOTE:**

The screws will remain as they are permanently attached to the chassis; however, this will not affect installation of the SMC II rear card.

Replacing SMC I with SMC II (Continued)

**Procedure -
Replace SMC Rear
Board
(DACS II AX-4)
Continued**

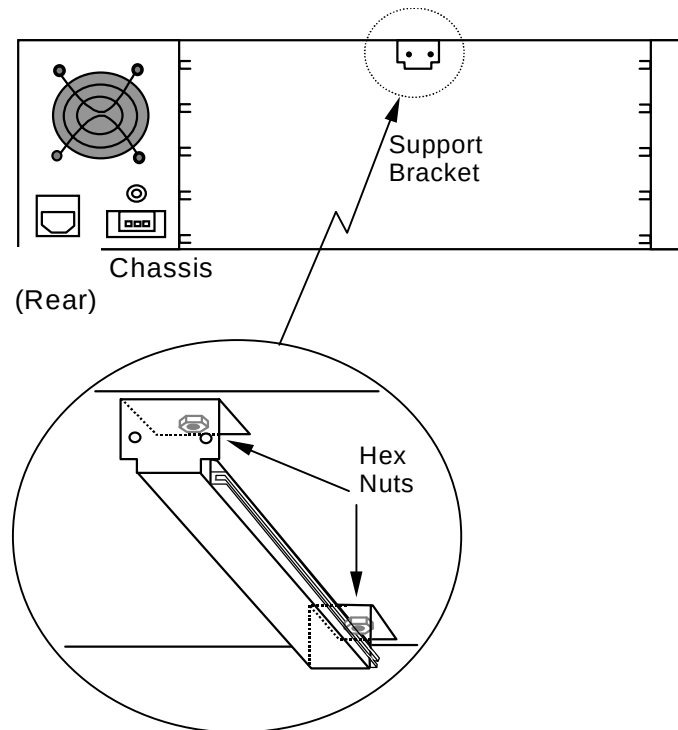


Figure 3-4. Cutaway View of the DACS II AX-4

Actions from the Node Summary Menu

Clear Error Counts On the *Node Summary Menu*, next to the *alarm column*, error conditions are indicated by an asterisk (*) to the left of the status condition. The (*) asterisk is a flag for error conditions such as, Bipolar Violations, CRCs, BERT errors, etc. The (*) can be cleared by pressing **C**. However, as long as errors are occurring, the asterisk will appear on the screen.

Press **C** to clear all error counts.

Lucent Technologies		DACS II AX 11 - System Manager		Help = [?]
Databases: InSync		N+1 Redundancy State: Enabled		
Alarm Contacts...: Enabled		Node Summary Menu		
Slot#	Configured Type	Device State	Alarm	
01	+ Octal T1/E1	Standby	None	
02	+ Octal T1/E1	Online	None	
03	+ Octal T1/E1	Online	None	
04	+ Octal T1/E1	Online	None	
05	+ Octal T1/E1	Online	None	
06	+ Octal T1/E1	Online	None	
07	+ Octal T1/E1	Online	None	
08	Octal T1/E1	Online	None	
09	Octal T1/E1	Online	None	
10	+ T3	Online	*None	
11	+ T3	Standby	None	
SMCA	System Manager A	Standby	None	
SMCB	System Manager B	Online	None	
PSX	ProtectionSwitch	Online	Major	
[C]lear error counts [S]lot Cfg [E]xpose [T]oggle Alarm Contacts				
N+1 Device Redundancy: Switch[O]ver [R]estore				

Figure 3-5. Asterisk shown in slot 10 indicating an error condition

```

Lucent Technologies          DACS II AX-11 - System Manager          Help = [?]
Databases: InSync           N+1 Redundancy State: Enabled
Alarm Contacts.....: Disabled

                                Node Summary Menu

Slot#  Con
-----  --- *****
01     + 0c *
02     + 0c *
03     + 0c *
04     + 0c *
05     + 0c *  This will clear error counts on all devices. Continue *
06     + 0c *
07     + 0c *
08       0c *
09       0c *
10     + T3 *****
11     + T3
SMCA    System Manager A Standby      None
SMCB    System Manager B Online       None
PSX     Switch Box      Online        None

[C]lear error counts  [S]lot Cfg      [E]xpose  [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver [R]estore

```

Figure 3-6. Clear Error Counts

Actions from the Node Summary Menu (Continued)

Slot Configuration To configure a slot or to change an existing card in a slot, type **S** from the Node Summary Menu. The Slot Configuration Menu displays (Figure 3-7).

Lucent Technologies
DACS II AX-11 - System Manager
Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1		Enable
2	Octal Voice		Disable
3	Octal Voice		Disable
4	Octal Voice		Disable
5	Octal Voice		Disable
6	Octal Voice		Disable
7	Octal T1/E1	New York	Enable
8	T3	San Francis	Enable
9	QUAD OCU		Disable
10	QUAD OCU		Disable
11	T3		Enable

N+1 Redundancy:
Enable

N+1 Redundancy Switchover:
Automatic

N+1 Redundancy Restore:
Manual

Change Card = [Enter key]
[D]elete Card

Figure 3-7. Slot Configuration Menu



NOTE:

If your DACS II AX does not have redundancy, the Slot Configuration screen will appear slightly different from the one shown in Figure 3-7.

Actions from the Node Summary Menu (Continued)

Fields on the Slot Configuration Menu

The Slot Configuration Menu displays information about each slot in the DACS II AX and information about the N+1 Protection Switch.

Slots in the DACS II AX

For each slot in the DACS II AX, the Slot Configuration Menu lists:

- **Slot Number (#):** 1 through 11 for the DACS II AX-11 and 1 through 4 for the DACS II AX-4.
- **Device Type:** The type of application module that is in the slot, such as Octal T1/E1, T3, Octal High Speed, etc.
- **Name:** The user-assigned name given to the slot.
- **Redundancy:** Indicates if the slot is configured to be part of a redundancy group. Redundancy must be enabled for each of the primary and standby cards in an Octal T1/E1, T3, or STS-1 redundancy group.

For example, the configured card type in Slot 1 must be Octal T1/E1 and Redundancy must be enabled, in order to support an Octal T1/E1 redundancy group. The configured card type in Slot 11 must be a T3 and Redundancy must be enabled, in order to support a T3 redundancy group. A *disable* in Slot 1 (Octal T1/E1) or Slot 11 (T3) will disable a T1/E1 or T3 redundancy group.

N+1 Protection Switch Fields

For the N + 1 Redundancy Switch, three fields appear near the bottom of the Slot Configuration Menu:

- **N + 1 Redundancy:** Possible states are:
 - **Enable** - The system will continue to display information about the N+1 Redundancy logic, even though the redundancy state for the specific slot remains enabled.
 - **Disable** - The cards in a redundancy group are no longer actively protected; in this condition, a switchover can not occur.
 - **Freeze** - Does not permit the N+1 Redundancy logic from updating the system; thus, the last result of the N+1 Redundancy is displayed.

Actions from the Node Summary Menu (Continued)

N+1 Protection Switch Fields (Continued)

When you select a setting for **N+1 Redundancy** on the *Slot Configuration Menu*, it corresponds with the **Device State** for the PSX on the *Node Summary Menu*. If the **N+1 Redundancy** is *Enabled* on the *Slot Configuration Menu*, and the **Device State** for the PSX is *Frozen* on the *Node Summary Menu*, a N+1 Protection Switch cable may be missing.

- **N + 1 Redundancy Switchover:** This option identifies the type of switchover that the system will use to operate. The modes for switchover are:
 - **Narrowband Automatic** - This setting enables a switchover to automatically occur on just the T1/E1 devices in a T1/E1 redundancy group.
 - **Broadband Automatic** - This setting enables a switchover to automatically occur on the protected broadband modules only. The protected broadband modules may be all T3s or all STS-1s.
 - **Automatic** - This setting enables a switchover to automatically occur on both the narrowband and broadband redundancy groups.
 - **Manual** - A switchover will not occur until the operator does so manually. Not recommended.

The changes made to the N+1 Redundancy State are recorded dynamically. It *will not* be necessary to save changes; however, you must exit the screen in order for the changes to take effect.

- **N + 1 Redundancy Restore:** The only option for restoring is **Manual**. When an off-line primary device is in *Standby* mode, the *Restore* command forces the selected device to go *Online*.

Details on the N+1 Protection Switch are provided in Chapter 10.

Actions from the Node Summary Menu (Continued)

Adding or Changing a Slot Configuration

To add or change a slot configuration:

1. From the Node Summary Menu, type **S**. The Slot Configuration Menu displays.
2. Move the cursor to a slot and press **<Enter>**. The Slot Configuration screen displays (Figure 3-8).

```
Lucent Technologies      DACS II AX-11 - System Manager      Help = [?]  
  
Slot Configuration  
  
Slot name:  
Card type:  
Redundancy: Disable
```

Figure 3-8. Card Slot Menu

3. Press **<Enter>**, type in a Slot name, and press **<Enter>** again.
4. Select a Card type. Place your cursor on Card type and press **<Enter>** to scroll through the card types until the desired card appears.
5. If you are configuring a slot for an Octal T1/E1 or T3 module that is going to be included in a redundancy group, select Enable for Redundancy.
6. To save changes, press **X**.
7. When prompted: "Update Configuration? Are you sure? (Y/N)" press **Y**.
8. Press **X** to return to the *Slot Configuration Menu*.

Actions from the Node Summary Menu (Continued)

Deleting Slot Contents

The card's configuration files are stored on the System Manager Card. When a card is replaced, the old configuration is preserved. When a card is physically removed from a slot, you should also delete its contents through the *Slot Configuration Menu*.

Procedure - Deleting Slot Contents

To delete a card from a slot:

**WARNING:**

If there are cross-connections to this slot, they will be lost. It is advisable to switch to a map that does not include cross-connections to this slot before deleting a slot configuration.

1. From the Main Menu, select *Node Summary*.
 2. Go to the Slot # where the card was located, then type **D**.
 3. This message appears: "All existing connections for this slot will be deleted! Are you sure (Y/N)?" This only applies to the active map.
 4. Press **Y**. The command executes and you return to the previous menu.
-

Actions from the Node Summary Menu (Continued)

Displaying Alarm Information

From the Node Summary Menu, you can display detailed alarm information about a problem or error condition of a device, Protection Switch, or SMC II.

Procedure - Displaying Alarm Information for a Module

To expose an alarm on a device card:

1. From the Main Menu, select *Node Summary*.
2. Go to the Slot # where the device is located, then type **E**. The following menu appears:

```

Lucent Technologies      DACS II AX-11 - System Manager      Help = [?]

                                Slot Information
      Slot Nbr:   11 Configured Type: T3                        Version: 1

-----
Device.....: Standby      Rear Card.....: Ok
Clock Source....: No       Frame Sync.....: Ok
In Test.....: No         System Clock.....: Ok
Error Indicator..: No      PSX Interface Card....: Ok

                                Port Alarm Information

01=None    02=None    03=None    04=None    05=None    06=None
07=None    08=None    09=None    10=None    11=None    12=None
13=None    14=None    15=None    16=None    17=None    18=None
19=None    20=None    21=None    22=None    23=None    24=None
25=None    26=None    27=None    28=None    T3=None

```

Figure 3-9. Device card alarm information exposed from the Node Summary Menu

Actions from the Node Summary Menu (Continued)

Procedure - Displaying Alarm Information for the N+1 Protection Switch

To expose an alarm on the N+1 Protection Switch:

1. From the Main Menu, position your cursor on the *Node Summary* field and press **<Enter>**.
2. Then position your cursor on the Protection Switch slot showing a *Critical* and/or *Major* alarm in the Alarm Status column and press **E**. A screen similar to the one shown in Figure 3-10 appears:

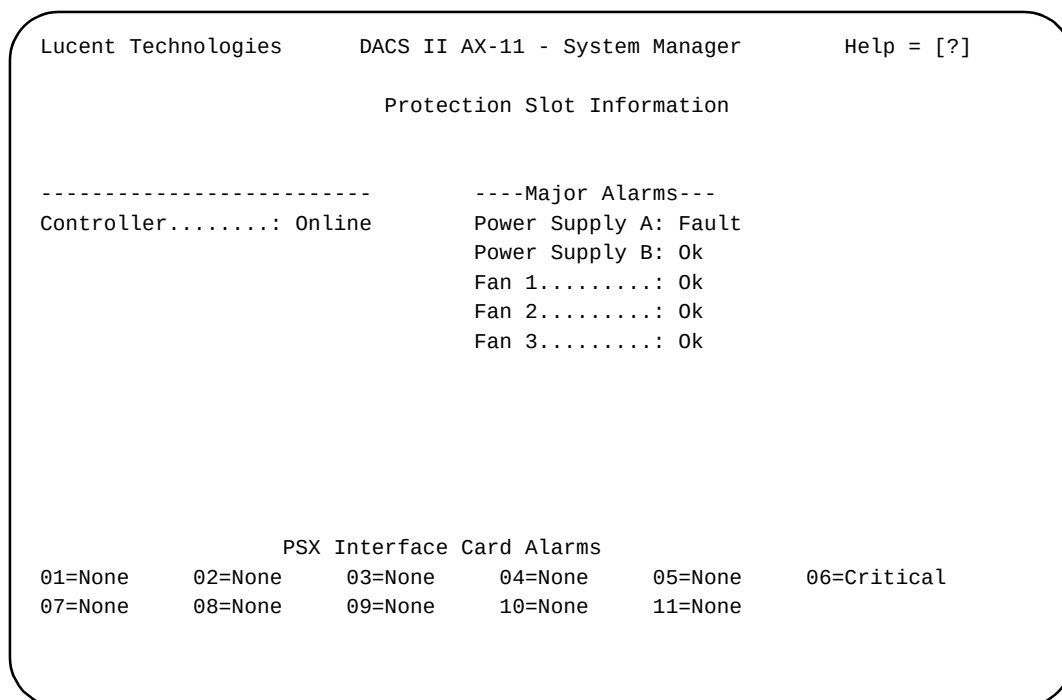


Figure 3-10. N+1 Protection Switch alarm information exposed

Actions from the Node Summary Menu (Continued)

Procedure - Displaying Alarm Information for an SMC

To expose an alarm in one of the SMC slots:

1. From the Main Menu, position your cursor on the *Node Summary* field and press **<Enter>**.
2. Then position your cursor on the *SMCA* or *SMCB* slot showing a *Critical* and/or *Major* alarm in the Alarm Status column and press **E**. A screen similar to the one shown in Figure 3-11 appears:

```
Lucent Technologies      DACS II AX-11 - System Manager      Help = [?]  
  
                        SMC Information  
Slot Nbr: SMCB Configured Type: System Manager B      Version: 1  
  
-----  
Device.....: Not Present      ----Major Alarms-----
```

Figure 3-11. SMC alarm information exposed

For more detailed information on alarms, refer to Chapter 9, *Alarms*, in this manual.

Actions from the Node Summary Menu (Continued)

Toggle Alarm Contacts

From the Node Summary Menu, you can enable or disable the alarm contacts on the SMC II rear interface. There is also an AC0 (Alarm Cut Off) button on the front of the SMC II.

Switchover

From the Node Summary Menu, you can manually switch over from a primary card to the standby card for a redundancy group. Position the cursor on the slot to be switched over and type **O**. Further detail is provided in Chapter 10.

Restore

Restoring can only be accomplished *manually*. The Restore action on the Node Summary screen returns traffic to a primary device that was offline and being protected by a redundant device.

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Background

Purpose

The purpose of this chapter is to explain how to configure the DACS II AX system and how to create and configure connection maps.

Objectives

This section is designed to enable you to:

1. Configure the slots in the DACS II AX.
 2. Set up the Node Profile.
 3. Identify the source for the system clock.
 4. Manage users.
 5. Identify the IP address for the DACS II AX.
 6. Identify the SNMP Agent configuration.
 7. Specify the date and time.
 8. Save and restore the database to a host computer.
-

Related Information

For additional information on the system clock source, refer to [Chapter 8. Clocking](#).

System Configuration Submenu

Menu Options

Figure 4-1 lists the options available from the System Configuration menu.

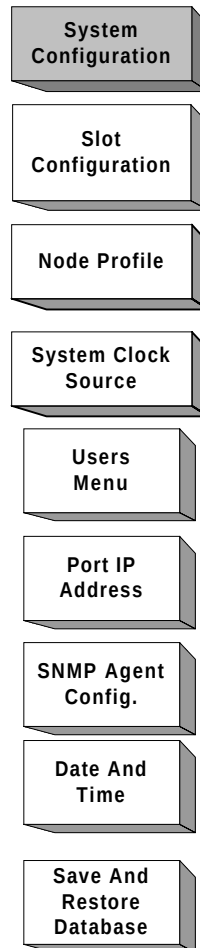


Figure 4-1. System Configuration Menu Options

System Configuration Submenu (Continued)

Functions

The following table lists the functions that can be performed from each of the System Configuration menu options.

Submenu	Function
Slot Configuration	Add or change a card type associated with a slot, and assign a name to a slot. For Device Redundancy: Configure and enable a redundancy group. Establish an automatic or manual switchover. Restore a protected device.
Node Profile	Assign a name to the DACS II AX. Enable or disable N+1 Redundancy plus alarm reporting in your system. Enable or disable the dual logic alarm feature in your system. Enable or disable dual power supplies in the N+1 Protection Switch.
System Clock Source Menu	Define the system clock source.
Users Menu	Administer user logins. Add and delete users. Define security levels.
Port IP Addresses	Define the IP address of the DACS II AX.
SNMP Agent Configuration	Define characteristics of the SNMP Agent.
Date and Time	Set or verify current date and time.
Save and Restore Database	Save/restore database from host PC or workstation.

Slot Configuration Submenu

Purpose

The Slot Configuration submenu is used to configure and view the types of modules in the DACS II AX. This menu displays 4 or 11 slots, depending upon your DACS II AX model. See Figure 4-2.

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
1	Octal T1/E1		Enable
2	Octal Voice		Disable
3	Octal Voice		Disable
4	Octal Voice		Disable
5	Octal Voice		Disable
6	Octal Voice		Disable
7	Octal T1/E1	New York	Enable
8	T3	San Francis	Enable
9	QUAD OCU		Disable
10	QUAD OCU		Disable
11	T3		Enable

N+1 Redundancy: Enable
N+1 Redundancy Switchover: Automatic
N+1 Redundancy Restore: Manual

Change Card = [Enter key] [D]elete Card

Figure 4-2. Slot Configuration Menu



NOTE:

If your DACS II AX does not have redundancy, the Slot Configuration screen will appear slightly different from the one shown in Figure 4-2.

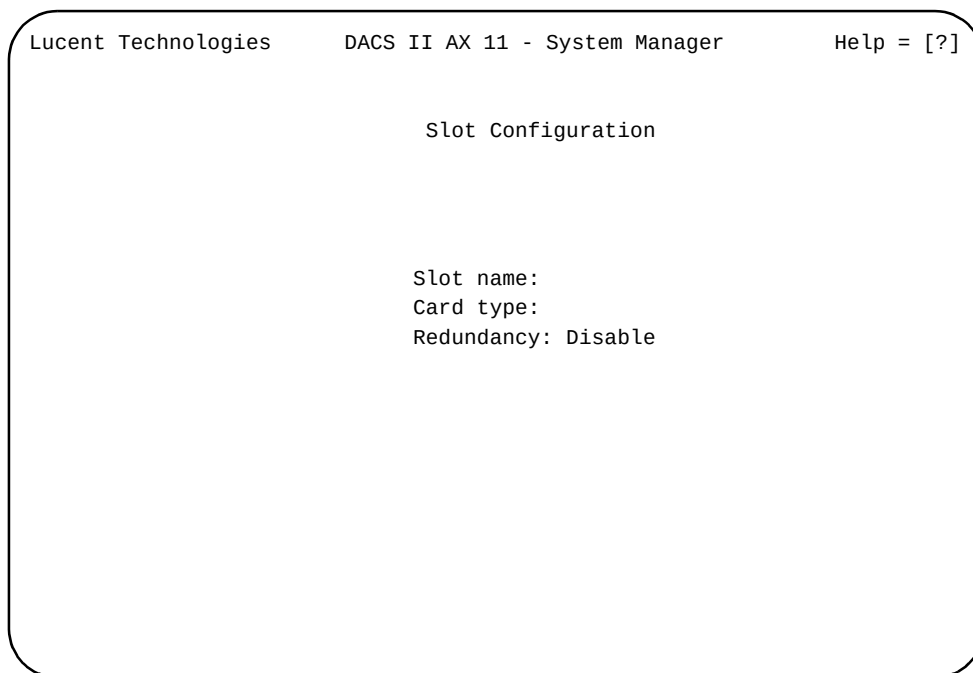
The fields on the Slot Configuration Menu are described in [Chapter 3, Node Summary](#).

Configuring a Slot

Procedure

To add or change a slot configuration:

1. From the DACS II AX Main Menu, select Slot Configuration.
2. Move the cursor to a slot and press <Enter>. The Slot Configuration screen displays (Figure 4-3).



```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
Slot Configuration  
  
Slot name:  
Card type:  
Redundancy: Disable
```

Figure 4-3. Card Slot Menu

3. Press <Enter>, type in a Slot name, and press <Enter> again.
4. Select a Card type. Place your cursor on Card type and press <Enter> to scroll through the card types until the desired card appears.
5. If you are configuring a slot for an Octal T1/E1 or T3 module that is going to be included in a redundancy group, select Enable for Redundancy.
6. To save changes, press X.
7. When prompted: "Update Configuration? Are you sure? (Y/N)" press Y.
8. Press X to return to the *Slot Configuration Menu*.

Deleting Slot Contents

The card's configuration files are stored on the System Manager Card. When a card is replaced, the old configuration is preserved. When a card is physically removed from a slot, you should also delete its contents through the *Slot Configuration Menu*.

Procedure - Deleting Slot Contents

To delete a card from a slot:

**WARNING:**

If there are cross-connections to this slot, they will be lost. It is advisable to switch to a map that does not include cross-connections to this slot before deleting a slot configuration.

1. From the DACS II AX Main Menu, select Slot Configuration.
 2. Go to the Slot # where the card was located, then type **D**.
 3. This message appears: "All existing connections for this slot will be deleted! Are you sure (Y/N)?" This only applies to the active map.
 4. Press **Y**. The command executes and you return to the previous menu.
-

Node Profile Submenu

Purpose

Use Node Profile to:

- Assign a name to the DACS II AX system. The system name will appear on the DACS II AX Main Menu.
- Identify if this DACS II AX has the N+1 Protection Switch, dual SMCs, and dual power supplies in the N+1 Protection Switch.



NOTE:

If you *do not* have dual SMC II boards, an N+1 Protection Switch, or dual power supplies in your N+1 Protection Switch, you will need to specify this in the *Node Profile Menu* or else a *Critical* alarm will be generated.

Procedure

1. Select *System Configuration* from the DACS II AX Main Menu.
2. Select *Node Profile*.
3. Specify options, then type **X**. To confirm action when prompted, press **Y**. Changes are saved and you are returned to the previous menu.

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
Node Profile Menu  
  
Node name: New York  
  
N+1 Redundancy Node.....: Yes  
N+1 Redundancy Broadband Group Type: T3  
Protection Switch Dual Power.....: Yes  
Dual System Mgr.....: No  
Alarm Contacts Type.....: Standard
```

Figure 4-4. Node Profile Menu

Node Profile Field Descriptions

Node Name (text field) Enter a name for this DACS II AX. This field accepts a name consisting of up to 30 alphanumeric characters.

N+1 Redundancy Node (option field) Select **Yes** or **No**. Indicate if this DACS II AX has a N + 1 Protection Switch. The default setting is **Yes**; however, if you do not have redundancy make sure you set this field to **No** or else a *Critical Alarm* will be triggered.

N+1 Redundancy Broadband Group (option field) If you have a broadband redundancy group, indicate which type of broadband modules will be protected: T3, HDS-3, or STS1.

Protection Switch Dual Power (option field) Select **Yes** or **No**. Yes confirms that you have two power supplies in your N+1 Protection Switch. The default setting is **Yes**; however, if you do not have a second power supply, make sure you set this field to **No** or else a *Critical Alarm* will be triggered.

Dual System Manager (option field) Select either **Yes** or **No**. Yes confirms that you have two SMCs in your DACS II AX system. The default setting is **Yes**; however, if you do not have a second SMC, make sure you set this field to **No** or else a *Critical Alarm* will be triggered.

Alarm Contacts Type (option field): Select **Standard** or **Local Audio**. Standard mode provides individual contact activation for each of the three alarm conditions, Critical, Major, and Minor with the X.25 network interface intact. The Local Audio mode provides relay contact activation for Critical/Major alarms. In Local Audio mode, the X.25 interface is redefined to interface with an optionally available Local Audible alarm unit.

Source Clock Submenu

Purpose

A timing source is used to provide timing and synchronization of equipment embedded within a network or provided by a stand-alone timing signal generator. The System Clock Source submenu is used to configure the DACS II AX so that it uses a common clock source for all modules and connections. For details, see [Chapter 8, Clocking](#).

Procedure

1. From the Main Menu, place your cursor on the *System Configuration* field and press **<Enter>**.
2. Then place your cursor on the *System Source Clock* field and press **<Enter>**. The *System Clock Source Menu* displays.

The screenshot shows a terminal window titled 'Lucent Technologies DACS II AX 11 - System Manager' with a 'Help = [?]' option in the top right. The main title is 'System Clock Source Menu'. Below it, the configuration is displayed as follows:

Mode.....: Primary		
Primary....: Station Clock A	Port: NA	
Secondary...: 01 -	Port: 04	
Tertiary...: Not Configured	Port: NA	
ACTIVE.....: Station Clock A	Port: NA	Primary

Figure 4-5. System Clock Source Menu

3. Select the mode by pressing **<Enter>** to cycle through the choices until the correct mode is displayed. If you are indicating *Auto*, *Primary*, *Secondary*, or *Tertiary* modes for line or external timing, you will also need to specify the slot and port number for each source. If you are indicating Free Run mode, proceed to step 5.
4. Select a slot and port number for each source of line or external timing by moving your cursor to the appropriate field and pressing **<Enter>** to cycle through the choices until the correct slot and port numbers are displayed.
5. Once the clocking sources are completely configured, press **X** to exit. When prompted: "Update Configuration? Are you sure (Y/N)?" press **Y**.

**NOTE:**

After configuring the source clock, the display may indicate that the DACS II AX configuration databases are out of sync. This is a normal condition when performing updates, and will clear up momentarily.

Source Clock Field Descriptions

Mode: (Option field) The options are:

- Primary
- Secondary
- Tertiary
- Free Run
- Auto

If the mode is set to *Primary*, *Secondary* or *Tertiary*, then only that clock source will be used. If the mode is set to *Auto* (automatic), then the DACS II AX System Manager will automatically choose the highest priority clock source that is currently available. It will automatically select from the *Primary*, *Secondary*, and *Tertiary* sources in order. Once the SMC II software finds an available external source, it will use it until it is no longer available. *Free Run* selects the internal Stratum 3 clock as the source clock.

NOTE: *The Automatic Mode is recommended because it provides clock source redundancy.*

Primary: Used to choose a slot and port number to utilize line timing as the clock source, set to utilize an external station clock (BITS clock) input, or set to *Not Configured*.

Secondary: Used to configure a secondary source of clocking. Same options as *Primary*.

Tertiary: Used to configure a tertiary source of clocking. Same options as *Primary*.

Active: Indicates the clock source that is being used by the online SMC II card.

Administering Users

Description

DACS II AX can support up to 20 different users. The DACS II AX Administrator maintains the user information, including adding, changing, or deleting users.

Individual users can display only information for their own login.

If a user forgets their password, only the Administrator can change their password.

Retrieving Personal Security Information

To retrieve personal security information:

1. From the AX Main Menu, select About, then select Who Am I.
2. Provide the password for the current session.

The AX displays Name, Security level, and Security mask of the user.

User Profile Manager Menu

Purpose

The DACS II AX Administrator uses the User Profile Manager Menu to add, change, or delete user information. To access the User Profile Manager Menu, from the AX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays (Figure 4-6).

Name	Id	Rights	Status	Name	Id	Rights	Status
-							
Alpha	123	Admin					

[A]dd user [D]elete user

Figure 4-6. Users Profile Manager Menu

For each user, the Users Profile Manager Menu displays:

- Name
- Audit trail identifier (Id). This appears on events in the Event Log.
- Assigned rights (Rights). This is the security level assigned to the user.
- Login status (Status).

All passwords are encrypted and not shown.

Adding a User

Description

The DACS II AX Administrator can add up to 20 different users; duplicate names are not accepted.

**NOTE:**

When the DACS II AX is initially installed, the first user that you add must have an Admin security level.

Procedure

To add a new user:

1. From the AX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays (Figure 4-6).
2. Press **A**. The User Configuration Menu displays (Figure 4-7).

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
User Configuration Menu  
  
Name.....:  
Audit trail identifier.....:  
Password (at least 6 char).:  
Confirm password.....:  
Security level.....: View Only
```

Figure 4-7. User Configuration Menu

3. Enter a Name, Audit trail identifier, password, and confirm the password. Select a Security level.
4. To save changes, type **X**.
5. When prompted: "Update Configuration? Are you sure (Y/N)? Type **Y**.

Fields on the User Configuration Menu

User Configuration Fields

Name: (Text field) Enter a name of up to 11 alphanumeric characters. This name will appear in the Name field on the Users Profile Manager Menu.

Audit Trail Identifier: (Text field) Enter an ID of up to three alphanumeric characters. This three character identification will appear in the ID field on the Users Profile Manager Menu. The event of adding, deleting or changing any user's configuration is considered to be an audit trail event. An audit trail event message starts with the audit trail identifier and then >> to indicate it is an audit trail message. Other user information that includes login or logout is considered a regular event message. Since multiple logins of the same user are allowed, the login and logout event message includes the user name as well as the total number of login sessions for that user.

Password: (Text field) Enter a password of at least six characters or else an error will occur upon exit. The password will not appear on any menu.

Confirm Password: (Text field) Type in the password entered in the password field to confirm your password.

Security Level: (Option field) The level of user rights associated with this user login. The security level will appear in the Rights field on the Users Profile Manager Menu. There are four levels of security:

- **View Only** - users at this level can view registers, circuit maps, and overall system configurations.
- **Test** - users at this level have all of the privileges from View Only, plus the ability to initiate and terminate BERT tests and loopbacks as well as clear performance registers.
- **Provisioning** - users at this level can access all of the AX features except for the ability to add and remove new users or TFTP software upgrades to the system.
- **Administration** - the highest level of access. Users at this level can access all AX functions and can add/remove users from the system. This user is able to delete and add new passwords in the event a user has forgotten his password.

Table 4-1, the SMC User Security Chart lists the menus that can be accessed by each user security level.

Changing User Information

Description

The Administrator can change any information associated with a Login Name, including the password. The Login Name cannot be changed. To change the Name, delete the login and add a new one with a new name.

Procedure

To change user information:

1. From the AX Main Menu, select System Configuration, then select Users Menu. The Users Profile Manager Menu displays (Figure 4-6).
2. Select the user login to be changed using the SPACEBAR, BACKSPACE or arrow keys, then press Enter.

The User Configuration Menu displays.

3. Edit the information on the User Configuration Menu. For details, refer to the previous section "User Configuration Fields."
 4. To save changes, type **X**.
 5. When prompted: "Update Configuration? Are you sure (Y/N)?
Type **Y**.
-

Procedure

1. From the Users Profile Manager Menu (Figure 4-6), put the cursor on the Name of the user to be deleted and press **D**.
2. When prompted: "Update Configuration? Are you sure (Y/N)? Type **Y**.

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]

                                Users Profile Manager

Name           Rights        Status      Name           Rights        Status
-----
alpha1         Administr *****
omega1         Administr *
bsmith         View Only   *              -MESSAGE!-    *
               *                               *
               *                               *
               * Delete user - bsmith?       *
               *                               *
               *                               *
               * Are you sure (Y/N)?         *
               *                               *
               *****

```

[A]dd user [D]elete user

Figure 4-8. Delete User

3. Press **X** to return to the System Configuration Menu.

Configuring the DACS II AX IP Address

Purpose

The Port Configuration Menu is used to configure the TCP/IP stack in the DACS II AX and control how it behaves on your 10BaseT LAN segment. These options only affect the 10BaseT port operation, they are not directly related to the flow of user data through the DACS II AX.

Procedure

To configure the IP address for the AX:

1. From the Main Menu, select System Configuration, then select Port IP Address.

The Port Configuration Menu displays (Figure 4-9).

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
      Port Configuration Menu  
  
      IP encapsulation.....: Ethernet II  
      LAN IP address.....: 0.0.0.0  
      LAN IP mask.....: 255.255.255.0  
  
      Enable RIP.....: No  
      Default gateway (if RIP disabled): 0.0.0.0
```

Figure 4-9. Port Configuration Menu

2. Specify information on the Port Configuration Menu.
3. Type **X** to save and exit to the previous menu. Confirm action when prompted, by typing **Y**.

Configuring the AX IP Address (Continued)

Fields

IP Encapsulation: (option field) The choices are Ethernet II or 802.3. If your LAN is using standard TCP/IP you should select Ethernet II for the encapsulation type. 802.3 encapsulation is used most often on LANs running Novell Netware. Your selection should match that used by other IP workstations and hosts on the LAN.

LAN IP Address: (text field) This parameter is used to specify the LAN IP address. Consult your network administrator to obtain a valid IP address for your LAN.

LAN IP Mask: (text field) The LAN IP mask is a 32-bit number represented in the same way as the IP address. A default mask is automatically generated; however, it can be overwritten to support subnetting. Subnetting allows you to allocate bits from the host portion of the IP address as an extension to the address. Depending on the type of IP network you are using (Class A, B or C), the subnet mask may be 24, 16 or 8 bits in length. Typically, the first three octets of the address defines the network address. The last octet defines the specific device.

Enable RIP: (option field) This parameter enables/disables RIP (Routing Information Protocol) on the LAN port. If the DACS II AX will always use the same IP address (router interface) to reach other segments you should leave RIP *OFF* and manually configure the router (gateway) information. You should enable RIP only if you want the DACS II AX to discover the devices available on the local LAN segment. RIP uses System Manager resources which might otherwise be used to manage the DACS II AX node. Consider leaving RIP *OFF* and manually configure a gateway address, especially in a high traffic LAN environment.

Default Gateway: (option field) This is the IP address of the router or switch that the DACS II AX should send packets to if their destination is on another LAN segment.

Configuring the SNMP Agent

Purpose

The SNMP Agent Configuration Menus used to configure the DACS II AX to work with an SNMP (Simple Network Management Protocol) management program running on one or more computers anywhere in the network. For information on SNMP Agent capabilities refer to the SMC800.MIB.

Procedure

To configure the SNMP agent:

1. From the Main Menu, select System Configuration, then select SNMP Agent Configuration.

The SNMP Agent Configuration Menu displays (Figure 4-10).

```
Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
                             SNMP Agent Configuration Menu

System Group Parameters
-----
System domain name....:
System description....:
System location.....:
System contact.....: enter contact name here

Trap Controls
-----
Traps.....: Disabled
Authentication traps..: Disabled

Client-manager IP Addresses          Community Profiles
-----
(used for trap destinations)          -----
0.0.0.0          0.0.0.0          Read-only:          Read-write:
0.0.0.0          0.0.0.0          public          public
0.0.0.0          0.0.0.0          public          public
0.0.0.0          0.0.0.0          public          public
```

Figure 4-10. SNMP Agent Configuration Menu

2. Specify the parameters for the SNMP Agent.
3. Type **X** to save and exit to the previous menu. Confirm action when prompted, by typing **Y**.

Configuring the SNMP Agent (Continued)

Fields

SYSTEM GROUP PARAMETERS

System domain name: *(text field)* This field is used to uniquely identify the DACS II AX system. It sets the MIB-II sysName variable.

System description: *(not user-programmable)* This field is a description of the DACS II AX system. It includes the full name and version identification of the system's hardware type, software operating system, and networking software. It sets the MIB-II sysDescr variable.

System location: *(text field)* This field defines the physical location of the DACS II AX system (i.e., utility room, ground floor, etc.). It can contain up to 48 ASCII characters. It sets the MIB-II sysLocation variable.

System contact: *(text field)* This field identifies the contact person for the DACS II AX system, and provides information on how to contact this person. It can contain up to 48 ASCII characters. (It sets the MIB-II sysContact variable.)

TRAP CONTROLS

Traps: *(option field)* This parameter enables/disables trap messages.

Trap Authentication: *(option field)* When this parameter is enabled, the DACS II AX sends authentication traps when an SNMP request is received with an invalid community string. If the strings do not match, access is denied. If the strings match, read-only or read/write access is provided, depending on the community string matched. The traps are prevented when the parameter is disabled.

Client-Manager IP Addresses [Default: 0.0.0.0]: The Client-Manager IP Addresses must be entered in "dotted decimal notation" form. Each of the four numbers in the address can range from 0 to 255. The addresses should match the addresses of the SNMP network management station that should receive the SNMP trap messages generated by the DACS II AX. Up to 8 addresses can be entered. If no address is entered, the DACS II AX sends its traps to the last manager that sent SNMP messages to the unit.

COMMUNITY PROFILES

Read-Only Community [Default: Public]: This is the community string used for the read-only access to the DACS II AX's MIB objects.

Read-Write Community [Default: Private]: This is the community string used for read-write access to the DACS II AX's MIB objects. If this parameter is set to the same value as the Read-Only Community profile, write access will be denied.

Setting the Current Date and Time

Description

Make sure the system date and time are set correctly. The date and time is used for scheduling maps and may appear on SNMP statistics.

**NOTE:**

For convenience, the Date and Time option can be set from either the Connections Map Menu or the System Configuration Menu.

Procedure

To change the date and time settings, follow these steps:

1. From the Main Menu, select System Configuration, then select Date and Time.

The Date and Time Menu displays.

The screenshot shows a terminal window titled "DACS II AX 11 - System Manager". The top bar contains "Lucent Technologies" on the left and "Help = [?]" on the right. The main content area is titled "Date and Time Menu" and displays the following settings:

```
Month.....: April
Day.....: 24
Year.....: 2000
Hour.....: 16
Minute....: 27
Second....: 45
Day of Week: Monday
```

Figure 4-11. Date and Time Menu

2. Scroll through the options for each field until the correct values display on the screen.

Reminder: Press Enter to scroll forward through the options or type **B** to scroll back. Press SPACE, BACKSPACE, or use the arrow keys to move between fields.

3. Type **X** and confirm action when prompted, by typing **Y**. Changes are saved and you return to the System Configuration menu.

Fields

All of these fields are option fields.

Month: Options are January through December.

Day: Options are 1 through 31.

Year: Change to current year.

Hour: Options are 0-23.

Minute: Options are 0 through 59.

Second: Options are 0 through 59.

Day of Week: Options are Sunday through Saturday.

Save and Restore Database

Description

The AX system provides the capability to save the system configuration database as a software file and to restore the system configuration from previously saved software files.

Since the system configuration is software-based, standard protocols like TFTP can be utilized to transfer the system configuration database to a remote host (PC or workstation). Conversely, files that have been uploaded to a remote host for archival purposes can be downloaded to an AX for disaster recovery or to facilitate system configuration on new installations.

**NOTE:**

For convenience, the Save/Restore Database option is also available from the Connection Maps Menu.

Saving the AX's Configuration Data to a Host

Description The SAVE operation gathers all of the files that exist on the AX, compresses them, and then sends them to the host.

If you plan to save more than one AX to the host, remember to enter a unique name for each file so that existing files do not get overwritten.

Procedure To save the AX's configuration to a host, use the following procedure.

1. Create a directory on the host that will store the AX's configuration. Because the configuration consists of several files, a separate directory is required for each AX.
2. Run the host's TFTP server.
3. From the AX Main Menu, select System Configuration, then select Save/Restore Database.

The Save and Restore Database Menu displays (Figure 4-12).

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
                          Save and Restore Database Menu  
  
Host IP address.: 193.222.333.444  
Host directory..: c:\dacsii\ax\  
Host file name..: hostconf  
  
[S]ave Database      [R]estore Database
```

Figure 4-12. Save and Restore Database Menu

4. Enter the remote host's IP address and the directory on the host where this AX's files are to be saved. Specify the file name for the file on the host. It is recommended that you change this name if you plan to save more than one AX to the host.
 5. Type **S** to execute the Save Database command and exit the menu.
An error message will be generated if either a directory name or filename is omitted.
 6. Type **Y** at the confirmation screen.
The progress of the transfer will appear on the screen. If there are any errors, correct the problem and perform the save again.
-

Restoring the AX's Configuration Data from a Host

Description

The RESTORE operation gathers the backup file from the host and restores the files on the AX's System Manager Cards.

When you restore file names, the file name on the host will have a .b extension.

Procedure

To restore the AX's configuration from a host, use the following procedure.

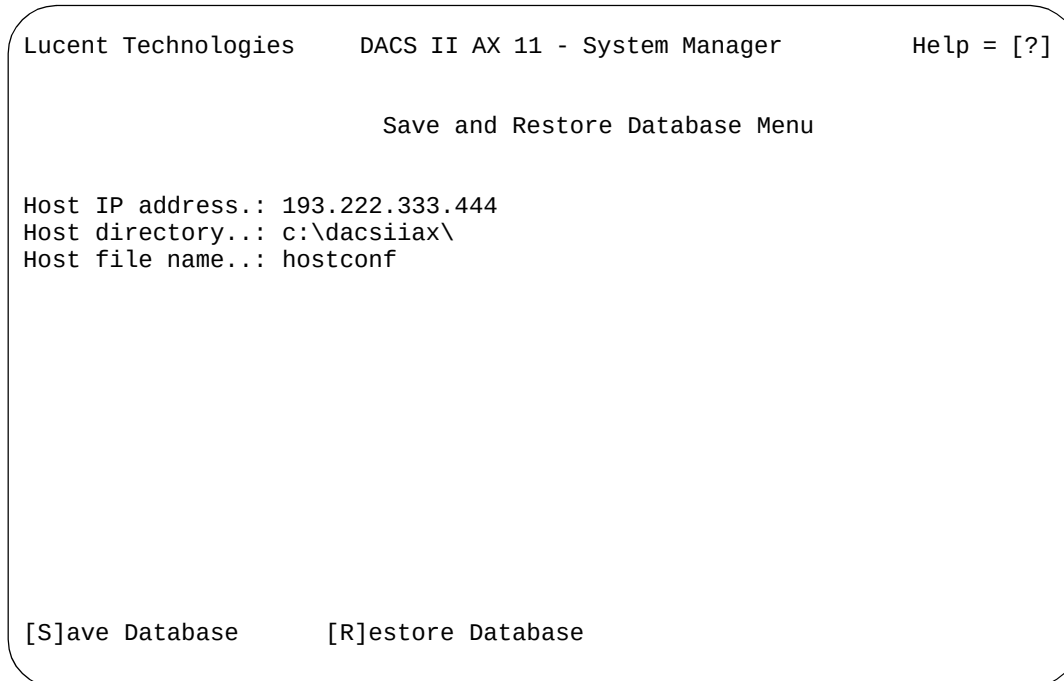
1. From the AX Main Menu, select System Configuration, then select select Port IP Address. Update the IP address information.

**NOTE:**

IP addresses must be re-entered before restoring the database.

2. Run the host's TFTP server.
3. From the AX Main Menu, select System Configuration, then select Save/Restore Database.

The Save and Restore Database Menu displays (Figure 4-13).



```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
                        Save and Restore Database Menu  
  
Host IP address.: 193.222.333.444  
Host directory..: c:\dacsii\  
Host file name..: hostconf  
  
[S]ave Database      [R]estore Database
```

Figure 4-13. Save and Restore Database Menu

4. The remote host's IP address and directory where this AX's configuration was saved will appear in the proper fields. If incorrect, enter the correct information.
5. Type **R** to execute the Restore Database command and exit the menu.
6. Type **Y** at the confirmation screen. The progress of the transfer will appear on the screen. If there are any errors, correct the problem and perform the restore again. After the files have been transferred the SMC will reset.
7. After reset, the off-line SMC is now on-line. Repeat steps 3 through 6.

Although both SMC II boards have the new configuration, none of the device cards have been updated.
8. To update the device cards, go to the Utilities Menu and reset all devices.



WARNING:

This is a service-affecting command and data will be momentarily interrupted.

Fields for Save and Restore Database

Save and Restore Database Fields

Host IP Address: *(text field)* This field is used to specify the remote host's IP address. IP addresses are 32 bits long and written as four decimal digits separated by a period. Each digit represents 8 bits of the address. The range of each digit is from 0 - 255.

Enter an IP address in dotted decimal form. If you do not know the remote host's IP address, consult your network administrator.

Host Directory: *(text field)* This field is used to specify the directory on the remote host where the DACS II AX's files are to be saved. A maximum of up to eight characters is allowed in this field. A slash (path separator) is automatically added to the end of the directory name, however, it is preferable to type in the appropriate path separator depending upon the host (*/* for DOS or ** for Unix).

Host File Name: The default host file name is **hostconf**. It is strongly recommended that you change this name if you plan to save more than one DACS II AX to the host. When you restore file names, the file name will have a .b extension. Up to eight characters may be entered in this field, entering more will generate an error.

SMC User Security System Summary

SMC User Security Chart

Table 4-1 summarizes the menus that can be accessed by each user security level.

- Shading indicates that the menu is not accessible by that user security level.
- Check mark (√) indicates the menu is accessible and the user actions are constrained by the user's assigned security level.

For example, a user with a View Only or Test Level capability can only display the Date and Time, whereas a user with Provision or Admin Level capability can change it.

Table 4-1. SMC User Security Chart

Menu Name	View Only Level	Test Level	Provision Level	Admin Level
CONNECTIONS MAP MANAGER				
Active Map	√ ¹	√ ³	√	√
Map Config	√ ²	√ ⁴	√	√
Map Definition	√	√	√	√
Time of Day Configuration	√	√	√	√
Date and Time	√	√	√	√
Save and Restore			√	√
SYSTEM CONFIGURATION				
Slot Configuration	√	√	√	√
System Clock Source	√	√	√	√
Node Profile				
Users Menu				√
Port IP Addresses	√	√	√	√
SNMP Agent Configuration	√	√	√	√
Date and Time	√	√	√	√
Save/Restore Database			√	√

**SMC User Security
Chart (Continued)****Table 4-1. SMC User Security Chart (Continued)**

Menu Name	View Only Level	Test Level	Provision Level	Admin Level
EVENTS				
Monitor Events	√	√	√	√
Display Event Log	√	√	√	√
Event Configuration			√	√
UTILITIES				
Copy File System			√	√
Switch Over SMCs			√	√
MIB Table	√	√	√	√
Ping			√	√
Show IP Route	√	√	√	√
Dump IP Route	√	√	√	√
ARP Table	√	√	√	√
Return to Default Setting				√
Backplane Timeslots Display	√	√	√	√
Initialize SMC Rear Card Modem				√
Download Devices Software				√
Reset All Channel Cards			√	√
ABOUT				
System Profile	√	√	√	√
Who Am I	√	√	√	√

NOTES:¹ - viewer can filter and use display related keys only.² - viewer can not access any function keys at the Configuration Maps Menu but can filter and use display-related keys at the Map Configuration Screen.³ - tester can access all other keys except add/listen/delete connection.⁴ - tester can not access any function keys at the Configuration Maps Menu but can use all keys except add/listen/delete connection at the Map Configuration Screen.

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Background

Purpose

The purpose of this chapter is to explain how to create, change, and delete cross-connections and configure connection maps.

Objectives

This section is designed to enable you to:

1. Display a map.
 2. Activate a map.
 3. Copy a map.
 4. Display selected cross-connections by using a filter.
 5. Establish cross-connections.
 6. Change cross-connections.
 7. Test cross-connections.
 8. Schedule maps.
-

Overview

Purpose of Maps

Connection maps provide the DACS II AX with a flexible tool that helps you manage the changing needs of your network. Up to five connection maps can be configured, but only one (the active map) can be active on the system at any instance.

There are several advantages to multiple maps:

- You might want to have different maps active at specific times of the day, depending upon the needs of your network. For example, you could have a daytime map with more voice than data connections and then a nighttime map with more data than voice connections.
- You can have a standby map with a known working configuration that can be activated quickly, should problems arise in the active map.
- You can safely try out new connections or deletions. For example, you can create a map with new connections and activate it. If problems occur, you can quickly reactivate the previous map or a standby map, thereby restoring service and minimizing any outages.

Maps can be activated either manually or by using the system's Time of Day automatic activation feature.

Connection Maps and the N + 1 Protection Switch

If your system is configured with the N+1 Protection Switch, do not configure mapping for the redundant devices.

- If you have both narrowband and broadband redundancy groups, do not configure mapping in slots 1 or 11.
- If you have only a narrowband (Octal T1/E1) redundancy group configured, do not use slot 1 for mapping.
- If you have only a broadband redundancy group (T3, hybrid DS-3, or STS-1) set up, do not use slot 11 for mapping.

**NOTE:**

The DACS II AX can protect one type of broadband module, not a mixed group of broadband modules. The DACS II AX 11 can accommodate T3, hybrid DS-3 and STS-1 modules in the same chassis, but only one type can be protected.

For more information on the N+1 Protection Switch, refer to Chapter 10.

Saving Connection Data

Any time a change is made to a map (active or inactive), the connection does not take effect (pass traffic) until you exit the Map Configuration Menu (Figure 5-1), and the change is saved to the database. See the circled note in Figure 5-1.

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]

Map Configuration:  Map 05
Note: You must exit this menu in order to update the switch map

Name      Src      Dest      Speed Type      Active Test      Tester Port
-----
TAM Bd to 07-01    08.01.01  07.01.10  0056k D  FDX
7/1-11 to 7/1-23  07.01.23  07.01.23  0056k D  FDX
09/01 to 02/01    09.01.01  02.01.01  1536k D  FDX
03/01 to 09/02    03.01.01  09.02.01  1536k D  FDX
09/03 to 02/02    09.03.01  02.02.01  1536k D  FDX
03/02 to 09/04    03.02.01  09.04.01  1536k D  FDX
09/05 to 02/03    09.05.01  02.03.01  1536k D  FDX
03/03 to 09/06    03.03.01  09.06.01  1536k D  FDX
09/07 to 02/04    09.07.01  02.04.01  1536k D  FDX
03/04 to 09/08    03.04.01  09.08.01  1536k D  FDX
09/09 to 02/05    09.09.01  02.05.01  1536k D  FDX
03/05 to 09/10    03.05.01  09.10.01  1536k D  FDX

Connection Filter: Not Active

[F]ilter      [A]dd/[D]elete/[L]isten Source/Listen Dest[i]nation
[T]est set up/[R]estore      [H]ome/[E]nd/[N]ext/[P]rev Page
  
```

Figure 5-1. Map Configuration Menu

Connection Maps Manager Menu

Menu Options

The Connection Maps Manager Menu (Figure 5-2) is used to access submenus that enable you to configure connection maps.

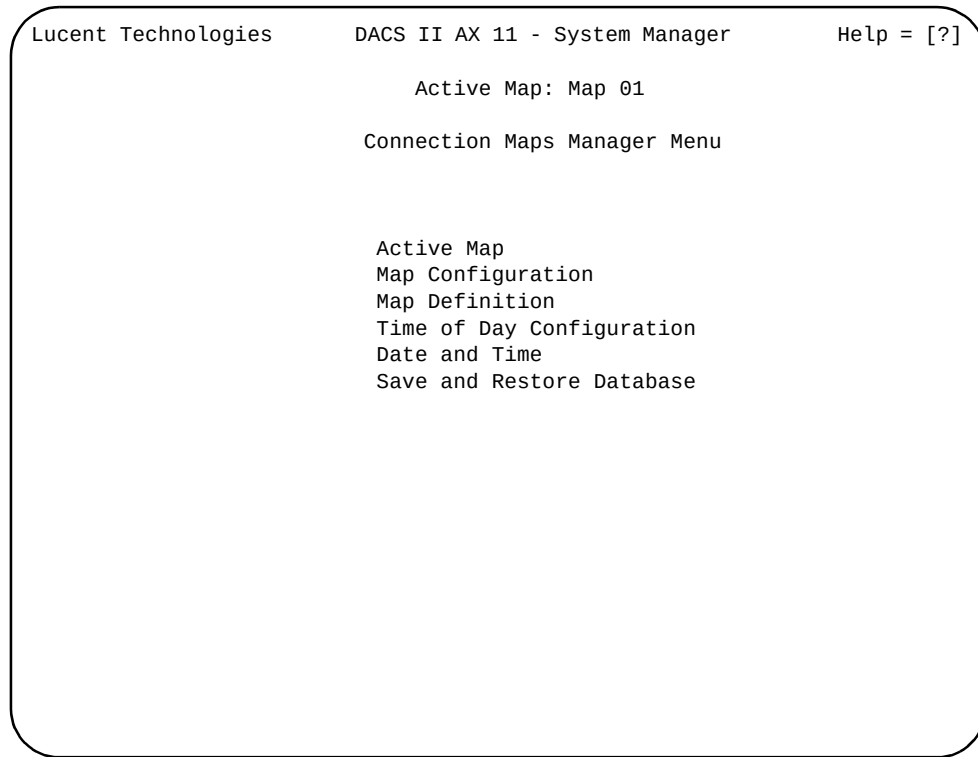


Figure 5-2. Connection Maps Manager Menu

Functions

The function of each submenu is described in the following table.

Table 5-1. Connection Maps Manager Menu Options

Submenu	Function
Active Map	Displays active map. From here, you can change the contents of the active map.
Map Configuration	Lists all maps. Provides "Active Map" and "Copy Map" functions. Select a map to display or change its contents.
Map Definition	Enables you to assign a name and brief description to a map.
Time and Day Configuration	Enables you to schedule maps for activation.
Date and Time*	Set or verify current date and time.
Save and Restore Database*	Save/Restore database from host PC or workstation.

*Also accessible from System Configuration Menu. These options are covered in Chapter 4, System Configuration.

Active Map Submenu

Purpose

The Active Map Submenu allows the user to directly enter into the connection map that is currently active to either view or configure it.

When you move your cursor to the Active Map field and press <Enter>, the active connection map is displayed. From here, you can set up a filter, test a connection, add a new connection, add a listening connection, or delete a connection. All of these actions are described in this chapter.

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]

      Map Configuration:  Map 05
Note: You must exit this menu in order to update the switch map

Name                      Src          Dest      Speed Type      Active Test  Tester Port
-----
TAM Bd to  07-01          08.01.01   07.01.10  0056k D    FDX
7/1-11 to  7/1-23          07.01.23   07.01.23  0056k D    FDX
09/01 to   02/01          09.01.01   02.01.01  1536k D    FDX
03/01 to   09/02          03.01.01   09.02.01  1536k D    FDX
09/03 to   02/02          09.03.01   02.02.01  1536k D    FDX
03/02 to   09/04          03.02.01   09.04.01  1536k D    FDX
09/05 to   02/03          09.05.01   02.03.01  1536k D    FDX
03/03 to   09/06          03.03.01   09.06.01  1536k D    FDX
09/07 to   02/04          09.07.01   02.04.01  1536k D    FDX
03/04 to   09/08          03.04.01   09.08.01  1536k D    FDX
09/09 to   02/05          09.09.01   02.05.01  1536k D    FDX
03/05 to   09/10          03.05.01   09.10.01  1536k D    FDX

Connection Filter: Not Active

[F]ilter                      [A]dd/[D]elete/[L]isten Source/Listen Dest[i]nation
[T]est set up/[R]estore      [H]ome/[E]nd/[N]ext/[P]rev Page

```

Figure 5-3. Sample Active Connection Map

Map Configuration Submenu

Purpose

From the Map Configuration Submenu, you can:

- choose a map to work on
- activate a map
- copy a map

Default Settings

The Configuration Maps Menu, in the factory default state, contains generic map names and descriptions (see below). It also has Map Number 01 set to be the default active map.

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Configuration Maps Menu

No.	Name	Description	Status
01	Map 01	Map 01 Description	Active
02	Map 02	Map 02 Description	
03	Map 03	Map 03 Description	
04	Map 04	Map 04 Description	
05	Map 05	Map 05 Description	

[A]ctivate map [T]ag map for copy [C]opy to all tagged maps

Figure 5-4. Configuration Maps Menu (Default)

Actions

From the Configuration Maps Menu, you can:

- Select a map to work on by moving the cursor to the map and pressing **<Enter>**.
- **[A]**ctivate map - Makes the selected map active.
- **[T]**ag map for copy - Pressing **T** will cause an asterisk to appear next to the Map Name, indicating that it is tagged and ready to have another map copied to it.
- **[C]**opy to all tagged maps - Selects the map which will be copied to all tagged maps.

**NOTE:**

If multiple Telnet sessions are open when you copy a connection map, the other Telnet sessions will disconnect due to processor utilization. The other sessions will be unable to re-connect while the map is being copied.

Activating A Map

Procedure

To activate a map:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*. The Configuration Maps Menu appears.

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Configuration Maps Menu

No.	Name	Description	Status
---	-----	-----	-----
01	Full Set	Data 64k/V ESF B8ZS	
02	Data 64k/v	Data 64k/v ESF B8ZS	
03	Data 56k/v	Data 56k/V E1 CAS	
04	Data 64k/v	Data 64k/v E1	
05	Map 05	New T3 Map	Active

[A]ctivate map [T]ag map for copy [C]opy to all tagged maps

Figure 5-5. Configuration Maps Menu

2. Move the cursor to the map to be activated, and press **A**.
3. Note that the Status entry for the map changes to Active. There can only be one active map at any time.

Displaying a Map

You can display and work on the Active Map or any of the standby maps.

Procedure

To display a map:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*. The Configuration Maps Menu appears.

The screenshot shows a terminal window titled "Lucent Technologies DACS II AX 11 - System Manager" with a "Help = [?]" option in the top right. The main content is the "Configuration Maps Menu", which displays a table of maps. The table has four columns: "No.", "Name", "Description", and "Status". The status of map 05 is "Active". Below the table, there are three options: "[A]ctivate map", "[T]ag map for copy", and "[C]opy to all tagged maps".

No.	Name	Description	Status
01	Full Set	Data 64k/V ESF B8ZS	
02	Data 64k/v	Data 64k/v ESF B8ZS	
03	Data 56k/v	Data 56k/V E1 CAS	
04	Data 64k/v	Data 64k/v E1	
05	Map 05	New T3 Map	Active

[A]ctivate map [T]ag map for copy [C]opy to all tagged maps

Figure 5-6. Maps Configuration Menu

2. From the Configuration Maps Menu, move your cursor to the map that you wish to select and press **<Enter>**. The Map Configuration Menu appears.

```
Lucent Technologies          DACS II 11 - System Manager          Help = [?]  
  
          Map Configuration:  Full Set  
Note: You must exit this menu in order to update the switch map  
  
Name          Src          Dest    Speed Type    Active Test  Tester Port  
-----  
2/1 to 9/1      02.01.01  09.01.01 1536k D  FDX  
2/2 to 9/2      02.02.01  09.02.01 1536k D  FDX  
2/3 to 9/3      02.03.01  09.03.01 1536k D  FDX  
2/4 to 9/4      02.04.01  09.04.01 1536k D  FDX  
2/5 to 9/5      02.05.01  09.05.01 1536k D  FDX  
2/6 to 9/6      02.06.01  09.06.01 1536k D  FDX  
2/7 to 9/7      02.07.01  09.07.01 1536k D  FDX  
2/8 to 9/8      02.08.01  09.08.01 1536k D  FDX  
3/1 to 9/9      03.01.01  09.09.01 1536k D  FDX  
3/2 to 9/10     03.02.01  09.10.01 1536k D  FDX  
  
Connection Filter: Not Active  
  
[F]ilter          [A]dd/[D]elete/[L]isten Source/Listen Dest[i]nation  
[T]est set up/[R]estore  [H]ome/[E]nd/[N]ext/[P]rev Page
```

Figure 5-7. Map Configuration Menu

The Map Configuration Menu displays the details of the selected connection map.

**Map
Configuration
Field Descriptions**

Name: This field represents the 19-character connection name given by the user on the Add New Connection Screen.

Source (Src): This field identifies the source for the connection. The six-digit identifier is broken into three 2-digit parts separated by decimal points, and indicates the physical slot, port and starting timeslot (if applicable) of the source module for the connection.

Destination (Dest): This field identifies the destination for the connection. The six-digit identifier is broken into three parts separated by decimal points, and indicates the physical slot, port and starting timeslot (if applicable) of the destination module for the connection.

Speed: This field represents the transmission speed. 1 DS0 equals 56 or 64K, depends upon whether voice or data is being sent.

Type: This field shows the type of traffic being connected (either Data (**D**), Voice (**V**) or Voice/AutoMu (**Vm**) as well as the type of connection.

**NOTE:**

Select **D** (Data) for T1 or E1 links that are configured as Clear Framed or Clear Unframed.

The connection types are listed below:

- **BRC** (Broadcast Connection) - transmits data from the declared source to the declared destination as a one-way connection.
- **BRM** (Broadcast Master) - transmits data from a single declared source to a number of ports at once. Broadcast Master declares no initial destination. Listen-Source ports are added after the broadcast master is defined. This is a half-duplex (one-way) connection. An example of this would be a stock "ticker tape" output being sent to multiple displays.
- **FDX** (Full-Duplex) - transmits and receives data to/from a declared destination as a two-way connection.
- **L-SRC** (Listen-Source) - monitors the source of any configured connection. This is a half-duplex (one-way) connection.
- **L-DEST** (Listen-Destination) - monitors the destination of any configured full-duplex connection. This is a half-duplex (one-way) connection.

Active Test: This field identifies the active test as one of the following:

- **Monitor-Src** (Monitor-Source) The active source connection is being "tapped into" and monitored with the connection remaining intact, since the connection does not have to be "torn down". The signal can be output to an external data scope through either a TAM or QHS module serial port.

- **Monitor-Dest** (Monitor-Destination) The active destination connection is being “tapped into” and monitored with the connection remaining intact, since the connection does not have to be “torn down”. The signal can be output to an external data scope through either a TAM or QHS module serial port.
- **Split-Src** (Split Source) The active source connection is being split off and rerouted to either a TAM or QHS module for diagnostic purposes. The connection can then be checked by means of BERT and loopback testing.
- **Split-Dest** (Split Destination) The active destination connection is being split off and rerouted to either a TAM or QHS module for diagnostic purposes. The connection can then be checked by means of BERT and loopback testing.

Tester Port: This field defines the port (address) of the TAM, or QHS card where the test will be run. The tester address will be shown as a four digit number separated by a decimal point, i.e., 01.02, where the first two digits represent the slot number and the last two digits represent the port number.

Map Commands

Use the following commands in a map:

Table 5-2. Connection Map Commands

Command	Description
F	Filter: Use to create connection filters for the map display. Only connections that match the filter criteria are displayed. To see all connections, make sure Filter Id is set to none .
A	Add: Use to add a new cross-connection to a map.
L	Listen-Source: Use to listen to a Broadcast Master or the source side of an existing cross-connection.
I	Listen-Destination: Use to listen to the destination side of an existing cross-connection.
D	Delete: Use to delete a cross-connection.
T	Test: Use to set up and run a test.
R	Restore: Use to end a test.
H, E, N, P	Home, End, Next, Previous: Use to navigate through the list of cross-connections in the map.



NOTE:

You must exit the Active Map menu in order to update the edited map with any changes you have made. See Figure 5-1.

Connection Filters

You can specify a connection filter so that only connections that match the filter criteria are displayed in the maps. For example, if you specify a slot number, only cross-connections that use the specified slot number are displayed in the map.

**NOTE:**

When you specify a connection filter, the filter is active for all maps and will stay activated until it is turned off.

Procedure

To set up a filter:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*.
2. Move your cursor to the map that you wish to set filters for, and press **<Enter>**. The Map Configuration Menu appears.

From the Map Configuration Menu, press **F**. The Connection Filter Configuration Menu appears.

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
      Connection Filter Configuration  
      -----  
      Filter Id.....: None  
      Connection Name...:  
      Slot Number.....: 0  
      Port Number.....: 0  
      TimeSlot Number...: 0
```

Figure 5-8. Connection Filter Configuration

3. Specify filter criteria by moving the cursor to the applicable field and pressing **<Enter>**. Once specified, press **X** to save.
 4. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. Exit the previous menu.
-

**Connection Filters
Field Descriptions**

Filter Id: (Option field) Select one of the following: None, By Connection Name, By Slot, By Slot/Port, Starting Slot/Port/Timeslot, By Data, By Voice.

Connection Name: (Text field) Enter up to 19 alphanumeric characters of the connection name(s) that you wish to appear in the maps. Wildcard (*) can be used. For example, to limit the display to all connections that have connection names that begin with src, enter src*.

Slot number: (Option field) Select the slot number of the connection(s) that you wish to appear in the maps.

Port number: (Option field) Select the port number of the connection that you wish to appear in the maps.

Timeslot number: (Option field) Select a timeslot number for the connection that you wish to appear in the maps.

Adding A New Connection

To add a new cross-connection to a map, you specify the source and destination. If the timeslots you specify are already filled, the DACS II AX will automatically assign available timeslots. You have the option to display the new timeslot allocation and make changes, if necessary.

Connections can be made without cards (modules) present as long as the Card Type is entered correctly on the Slot Configuration screen.

Before You Begin

When a change is made to any map, the connection does not take effect (pass traffic) until you exit the Map Configuration Menu, and the change is saved to the database. See Figure 5-1.

Clear T1 Mode

When using Clear T1 mode, make a connection ensuring that 25 DS0s have connections mapped. This is necessary because of the way Clear T1 mode operates, taking the framing bits from the first 24 DS0s and sending them all out through the 25th DS0.

On the Add New Connection Screen, select **D** (Data) for T1 links that are configured as Clear Framed or Clear Unframed.

Procedure

To add a new connection to a map:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*.
2. Select a map.
3. From the Map Configuration Menu, press **A**. The Add New Connection Screen appears.

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Add New Connection Screen

Connection name: Type.....: Full-Duplex

Src slot.....: Dest slot.....:

Src port.....: 01 Dest port.....: 01

Starting Src Ts: 01 Starting Dest Ts: 01

Speed.....: 56K (1 DS0) Voice/Data.....: Data

Ts Allocation : Auto-Consecutive

[S]ave connection

Figure 5-9. Add New Connection Screen

- Set the parameters of the connection. See "Connection Fields" for details.

**NOTE:**

If your system is configured with the N+1 Protection Switch, and you have redundancy groups, do not configure mapping for the redundant cards in slot 1 and/or slot 11.

- When done, press **S** or **X** to save the connection information. Use **S** if you plan to make multiple connections, as you will automatically return to the Add New Connection Screen.
- You are prompted: "View timeslot allocation? Are you sure? (Y/N)".
- Press **Y** to display the timeslot allocation. Go on to step 9.
- If you press **N**, the timeslot allocation is not displayed, however the new connection is still made. The *Add New Connection Screen* is still present, and the connection is configured.

**NOTE:**

The connection is not enabled until you exit the Connections Map Menu and the connection is saved to the database. Until then, the new connection will NOT pass traffic. Removing the connection requires the same process before it is complete. See Figure 5-1.

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]

                          Change Connection screen

Connection name: 2/1 to 9/1      Type.....: Full-Duplex
Src slot.port : 02.01 Octal T1/E1  Dest slot.port: 09.01 T3
Speed.....: 1536K/64 (24 DS0s)  Data/Voice....: Data
-----
Src Port Time slot assignments      Dest Port Time slot assignments
01 2/1 to 12 2/1 to 23 2/1 to      01 2/1 to 12 2/1 to 23 2/1 to
02 2/1 to 13 2/1 to 24 2/1 to      02 2/1 to 13 2/1 to 24 2/1 to
03 2/1 to 14 2/1 to 25 .           03 2/1 to 14 2/1 to
04 2/1 to 15 2/1 to 26 .           04 2/1 to 15 2/1 to
05 2/1 to 16 2/1 to 27 .           05 2/1 to 16 2/1 to
06 *                               06 *
07 *                               07 *
08 2/1 to 19 2/1 to 30 .           08 2/1 to 19 2/1 to
09 2/1 to 20 2/1 to 31 .           09 2/1 to 20 2/1 to
10 2/1 to 21 2/1 to 32 .           10 2/1 to 21 2/1 to
11 2/1 to 22 2/1 to                11 2/1 to 22 2/1 to

T1- DS0s:1->24 are valid; DS0s:25->32 are ignored
E1- DS0s:1->32 mapped to DS0s:0->31; DS0:1 Reserved; in CAS DS0:17 reserved
[V]iew all connections      [C]lear connection timeslots
  
```

Figure 5-10. Change Connection Screen

9. The new cross-connection is displayed. Timeslots that contain an asterisk (*) are assigned.

Saving Connection Data

Figure 5-11 shows the sequence of screens that appear when you add a connection. Note that you must exit from the Map Configuration menu shown at the top of this figure in order for changes to be saved to the database.

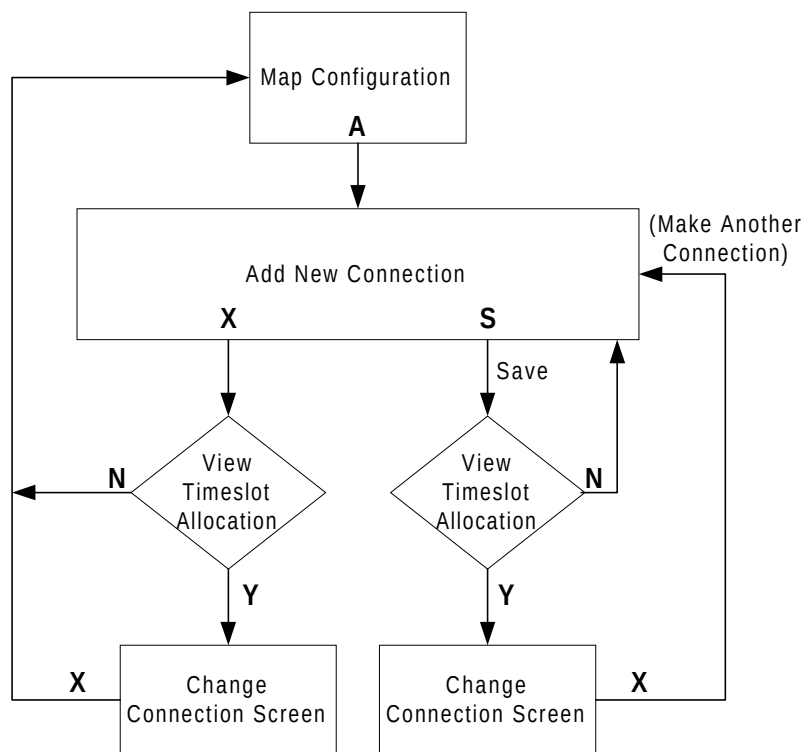


Figure 5-11. Add A Connection Flowchart

Connection Field Descriptions

Connection Name: (Text field) This field is used to enter a name for the connection you are configuring. Any name up to 19 characters in length may be entered.

Type: (Option field) This field is used to select the type of connection:

- **Full-Duplex** - In full-duplex connections, data is transmitted and received to/from a specific destination for a two-way connection.
- **Broadcast Connection** - Broadcast connections declare a source and destination. Data flows from the source to the destination.

- **Broadcast Master** - Broadcast Master transmits data from a single source to a number of ports at once. Broadcast Master declares no initial destination. Listen-Source ports are declared after the broadcast master is defined. This is a half-duplex (one-way) connection. An example of this would be a stock "ticker tape" output being sent to multiple displays.

Source Slot and Port: (Option field) These fields are used to select the source slot and source port for the connection. The port always defaults to 01. You can allocate the slot number.

Starting Source Timeslot: (Option field) This field is used to select the starting source timeslot number (DS0) for automatic timeslot allocation. Octal Voice, Octal High Speed, and Quad High speed modules do not map time slots.



NOTE:

There are 24 timeslots for T-1 and 32 for E-1. For T-1, slots 1-24 are available, slot 25 is used for Clear T1 mode, and 26-32 are not used at all. For E-1, all slots are available except slot 1 (used for framing). Slot 17 is not available when in E-1 CAS or E-1 CAS-CRC mode (reserved for signaling).

Speed: A T1 digital transmission facility carries twenty-four 64 Kbps (DS0) "channels," for a total of 1.536 Mbps (plus 8K overhead to achieve 1.544 Mbps). An E-1 digital transmission facility carries thirty-two 64Kbps (DS0) "channels" for a total of 1.984 Mbps (plus 64k overhead to achieve 2.048 Mbps). These DS0s can be assigned to specific connectors on the equipment to transport computer and/or voice information. In some cases, the user has access to the full 64 Kbps per channel while, in other cases, the user is limited to 56 Kbps per channel.

Before entering a value, the user must first determine if each DS0 will carry 56 Kbps or 64 Kbps of user data and then determine the correct quantity of DS0s necessary to achieve the desired data rate.

If the "Density" parameter is "Clear" on the Configuration screen, the 56/64 decision is completely user optional and "64 Kbps" is recommended to obtain maximum data transfer efficiency in the network. If "clear" is not chosen for the "density" parameter, steps must be taken to ensure proper "ones density" in the data presented to the network. If this is not done, the DACS II AX may occasionally change the user data in order to satisfy network requirements.

There are three methods that can be used to ensure ones density in the data:

Limit the user data to 56 Kbps per DS0. The DACS II AX will use the remaining 8 Kbps (in each DS0) to provide the required density.

Allow 64 Kbps user data in each DS0 and use alternate DS0s. Keep the intervening DS0s idle to provide the density. See DS0 Order below. This method wastes significant bandwidth and should only be used when absolutely necessary.

Allow 64 Kbps user data in each DS0 when the user's protocol provides the required density. When the 56/64 decision has been made, choose the desired data rate. The correct DS0 quantity is displayed on the right side of the selection.

In some cases, the same data rate can be achieved with two different DS0 quantities, one with 56 Kbps DS0s and the other with 64 Kbps DS0s.

Destination Slot and Port (Dest slot and Dest port): These fields are used to select the destination slot and destination port for the connection. The port always defaults to 01. You can allocate the slot number.

Starting Destination Timeslot (Starting Dest Ts): This field is used to select the starting destination timeslot number (DS0) for automatic timeslot allocation.

Data/Voice: This field is used to select the type of traffic being connected (either **Data**, **Voice**, or **Voice/AutoMu**).

Timeslot Allocation (Ts Allocations): This field is used to determine how the timeslots will be allocated. The choices are **Auto-Consecutive**, **Alternate**, and **Manual**.

- When **Auto-Consecutive** is selected, the DACS II AX will automatically allocate timeslots in consecutive order, beginning with the starting source/destination timeslot.
- When **Alternate** is selected, the DACS II AX will allocate timeslots alternately, beginning with the starting source/destination timeslot.
- When **Manual** is selected, there is no automatic allocation of timeslots.

Timeslot Allocation Conflicts: If there are no more timeslots available, the user will be notified by a pop-up window.

Changing An Existing Connection

This screen is used for two purposes: to re-assign timeslots and to change the speed. All other parameters are read-only.

Procedure

To re-assign timeslots or to change the speed for an existing connection:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*.
2. Select a map.
3. From the Map Configuration Menu, move the cursor to the connection to be changed and press **<Enter>**. The Change Connection Screen appears.

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]

                                Change Connection screen

Connection name: 2/1 to 9/1          Type.....: Full-Duplex
Src slot.port : 02.01 Octal T1/E1    Dest slot.port: 09.01 T3
Speed.....: 1536K/64 (24 DS0s)      Data/Voice....: Data
-----
Src Port Time slot assignments      Dest Port Time slot assignments
01 2/1 to 12 2/1 to 23 2/1 to      01 2/1 to 12 2/1 to 23 2/1 to
02 2/1 to 13 2/1 to 24 2/1 to      02 2/1 to 13 2/1 to 24 2/1 to
03 2/1 to 14 2/1 to 25 .           03 2/1 to 14 2/1 to
04 2/1 to 15 2/1 to 26 .           04 2/1 to 15 2/1 to
05 2/1 to 16 2/1 to 27 .           05 2/1 to 16 2/1 to
06 2/1 to 17 2/1 to 28 .           06 2/1 to 17 2/1 to
07 2/1 to 18 2/1 to 29 .           07 2/1 to 18 2/1 to
08 2/1 to 19 2/1 to 30 .           08 2/1 to 19 2/1 to
09 2/1 to 20 2/1 to 31 .           09 2/1 to 20 2/1 to
10 2/1 to 21 2/1 to 32 .           10 2/1 to 21 2/1 to
11 2/1 to 22 2/1 to                11 2/1 to 22 2/1 to

T1- DS0s:1->24 are valid; DS0s:25->32 are ignored
E1- DS0s:1->32 mapped to DS0s:0->31; DS0:1 Reserved; in CAS DS0:17 reserved
[V]iew all connections      [C]lear connection timeslots

```

Figure 5-12. Change Connection Screen

From the Change Connection screen, you can do the following:

- To display all connections, press **V**.
 - To clear the connection, press **C**.
 - If needed, change the Speed for the connection.
4. To reassign a timeslot assignment:
 - a. First, clear the connection. Move the cursor to the Src or Dest Port time slot assignment and press **C**. Both sides of the connection will be cleared from the screen.
 - b. Move your cursor to the new Source timeslot(s) and press **<Enter>**.
 - c. Move cursor to the new Destination timeslot(s) and press **<Enter>**.
 5. To save changes, press **X**.
 6. When prompted: "Update Configuration? Are you sure (Y/N?)" press **Y**.
 7. Press **X** to save the updated configuration to the database and return to the Configuration Map Menu.

**NOTE:**

The connection is not enabled until you exit the Change Connection Screen and the connection is saved to the database. Until then, the new connection will NOT pass traffic. See Figure 5-1.

Setting Up A Listening Connection

Listening to a connection allows you to monitor a source or a destination. There is a one-way path from the source or destination to the listening port.

Listeners can be set up for broadcasting or for test access.

A Listen-Source connection can be configured on any type of connection - Full Duplex (FDX), Broadcast Connection (BRC), or Broadcast Master (BRM). For example, to deliver a broadcast from a Broadcast Master, set up Listen-Source connections. The Listen-Source connection is half-duplex. It is a one-way path from the Source in the original connection to the Listen-Source.

A Listen-Destination connection can be configured on a full-duplex connection. The Listen-Destination connection is half-duplex. It is a one-way path from the Destination in the original connection to the Listen-Destination.

Adding a Listen-Source Connection

To add a Listen-Source Connection:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*.
2. Select a map.
3. From the Map Configuration Menu, move the cursor to an FDX, BRM, or BRC connection and press **L** (for a Listen-Source Connection).

The following menu appears:

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
Add New Connection Screen  
  
Connection Name.: Source      Type.....: Listen-Source  
  
Src Slot.....: 04      Dest Slot.....: 04 - Slot 4  
Src Port.....: 01      Dest Port.....: 03  
Starting Src Ts.: 01      Starting Dest Ts: 01  
Speed.....: 56K      (1 DS0)      Voice/Data.....: Data  
  
Ts Allocation...: Auto-Consecutive  
  
[S]ave connection
```

Figure 5-13. Add A New Connection Screen (Listen-Source)

4. Enter the name and destination. See "Connection Field Descriptions" for details.
5. When done, press **S** to save and configure another Listen-Source connection or press **X** to save and exit.

Adding a Listen-Destination Connection

To add a Listen-Destination Connection:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*.
2. Select a map.

3. From the Map Configuration Menu, move the cursor to a full- duplex (FDX) connection and press **i** (for a Listen Destination Connection). The following menu appears:

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Add New Connection Screen

Connection Name.: Dest	Type.....: Listen-Destination
Src Slot.....: 08	Dest Slot.....: 08 - HDS3
Src Port.....: 01	Dest Port.....: 01
Starting Src Ts.: 01	Starting Dest Ts: 02
Speed.....: 56K (1 DS0)	Voice/Data.....: Data

[S]ave connection

Figure 5-14. Add A New Connection Screen (Listen-Destination)

4. Enter the name and destination. See "Connection Field Descriptions" for details.
5. When done, press **S** to save and configure another Listen-Destination connection or press **X** to save and exit.
6. When you attempt to save the connection, you will be prompted to view the timeslot allocation. Press **Y** to view.
7. View the timeslot allocation. Make changes and save, if needed. See "Changing an Existing Connection" for details.

8. Press **X** to save the updated configuration to the database and return to the Configuration Map Menu.

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]

                                Map Configuration:   Map 01
Note: You must exit this menu in order to update the switch map

Name                          Src          Dest    Speed Type    Active Test    Tester Port
-----
Full                          04.01.01   08.01.01 0056k D    FDX
Source                        04.01.01   04.03.01 0056k D    L-SRC
Dest                          08.01.01   08.01.02 0056k D    L-DEST
Test                          08.01.01   01.01.01 0056k D    L-DEST
--
--
--
--
--
--
--
--
--
--
Filter: Not Active
[F]ilter                      [A]dd/[D]elete/[L]isten Source/Listen Dest[i]nation
[T]est set up/[R]estore      [H]ome/[E]nd/[N]ext/[P]rev page

```

Figure 5-15. Map Configuration Menu (Listening Connections Configured)



NOTE:

The connection is not enabled until you exit the Change Connection Screen and the connection is saved to the database. Until then, the new connection will NOT pass traffic. See Figure 5-1.

Testing a Connection

Use this procedure to select a test type and to define the address (slot and port) where the test will be run. All other parameters are read-only.

Procedure

To test a connection:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*.
2. Select a map.
3. From the Map Configuration Menu, move the cursor to the connection to be tested and press **T**. The Test Connection Screen appears.

Lucent Technologies
DACS II AX 11 - System Manager
Help = [?]

**** Test Connection screen ****

Connection name: 7/02-04 to 7/02-16
Type.....: Full-Duplex

Src slot.port : 07.02 Quad T1
Dest slot.port: 07.02 Quad T1

Speed.....: 64K (1 DS0)
Data/Voice....: Voice

===== Test id...: None
TESTER slot.port: .

Src Port Time slot assignments

Dest Port Time slot assignments

01 *	12 *	23 *	01 *	12 *	23 *
02 *	13 *	24 *	02 *	13 *	24 *
03 *	14 *		03 *	14 *	
04 7/02-04	15 *		04 .	15 *	
05 *	16 .		05 *	16 7/02-04	
06 *	17 *		06 *	17 *	
07 *	18 *		07 *	18 *	
08 *	19 *		08 *	19 *	
09 *	20 *		09 *	20 *	
10 *	21 *		10 *	21 *	
11 *	22 *		11 *	22 *	

Figure 5-16. Test Connection Screen

4. Specify the type of test in the Test Id field.
5. Specify where the test will be run in the *TESTER slot.port* field.

6. To save changes and exit to the Active Map menu, press **X** and confirm action when prompted by pressing **Y**.
 7. To restore a connection that has been put under test, on the Map Configuration screen, move the cursor to the Name where the connection is located and press **R**.
-

**Test Connection
Field Descriptions**

Test Id: This field is used to select one of four possible tests:

- **Monitor-Src** (Monitor-Source) Provides a means for active source connection to be "tapped into" and monitored with the connection remaining intact, since the connection does not have to be "torn down" to conduct this test. The signal can be output to an external data scope through either a TAM or QHS module serial port, and easily restored by pressing **R** from within the Map Configuration Screen. Figure 5-17 is a basic diagram of Monitor-Source testing.

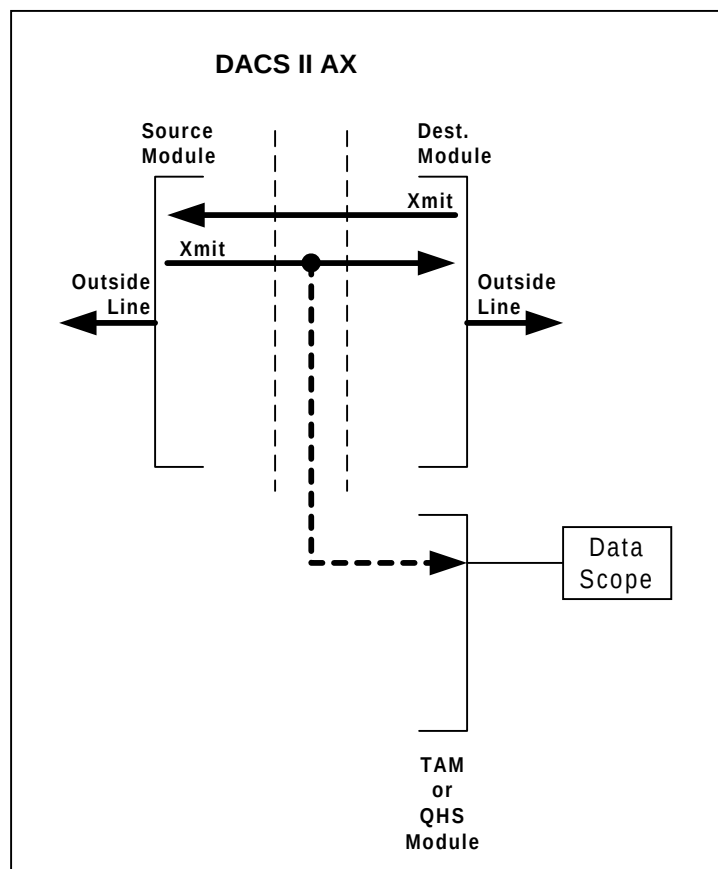


Figure 5-17. Monitor-Source Testing

- **Monitor-Dest** (Monitor-Destination) Provides a means for active destination connection to be “tapped into” and monitored with the connection remaining intact, since the connection does not have to be “torn down” to conduct this test. The signal can be output to an external data scope through either a TAM or QHS module serial port, and easily restored by pressing **R** from within the Map Configuration Screen. Figure 5-18 is a basic diagram of Monitor-Destination testing.

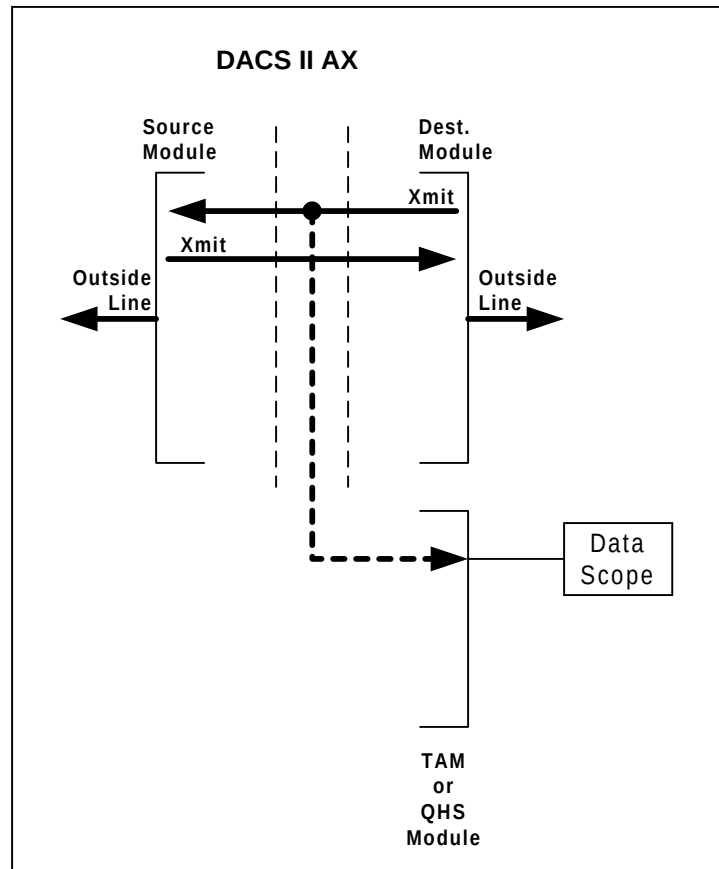


Figure 5-18. Monitor-Destination Testing

- **Split-Src** (Split Source) Provides a means for an active source connection to be quickly split off and rerouted to either a TAM or QHS module for diagnostic purposes. The connection can then be checked by means of BERT and loopback testing. The connection is stored in memory, and can be easily restored by pressing **R** from within the Map Configuration Screen. Figure 5-19 is a basic diagram of Split-Source testing.

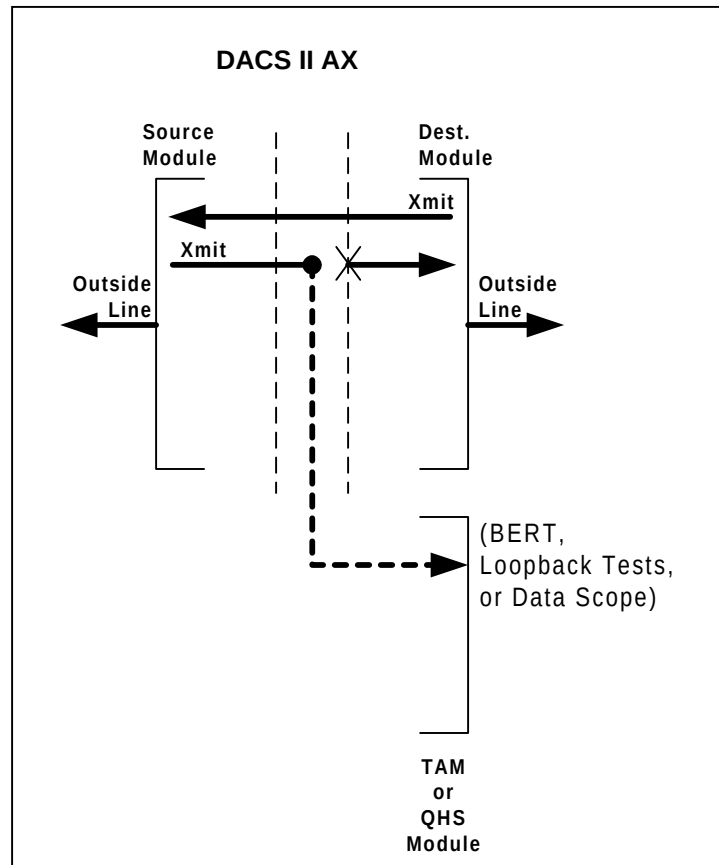


Figure 5-19. Split-Source Testing

- **Split-Dest** (Split Destination) Provides a means for an active destination connection to be quickly split off and rerouted to either a TAM or QHS module for diagnostic purposes. The connection can then be checked by means of BERT and loopback testing. The connection is stored in memory, and can be easily restored by pressing **R** from within the Map Configuration Screen. Figure 5-20 is a basic diagram of Split-Destination testing.

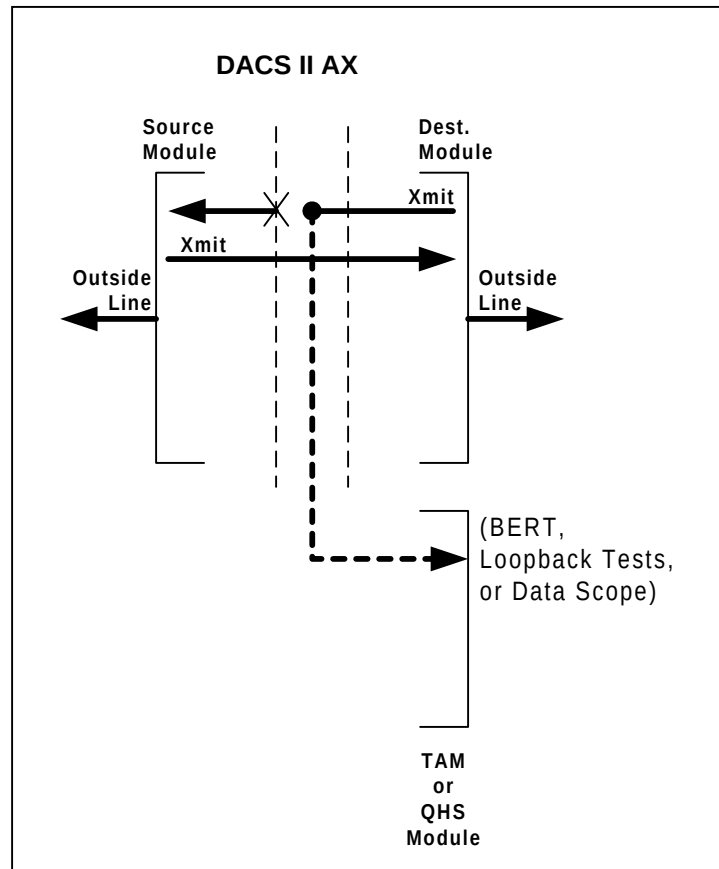


Figure 5-20. Split-Destination Testing

TESTER slot.port: This field is used to define the address (slot and port) where the test will be run. The tester address is written as a four digit number separated by a decimal point, i.e., 01.02, where the first two digits represent the slot number and the last two digits represent the port number.

Copying A Map

You can create one or more copies of a map. You may want to copy a map and use it as a basis for a new map. You cannot copy a map into an Active Map.

**NOTE:**

If multiple Telnet sessions are open when you copy a connection map, the other Telnet sessions will disconnect due to processor utilization. The other sessions will be unable to re-connect while the map is being copied.

Procedure

To copy a map:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*. The Configuration Maps Menu appears.
 2. Move the cursor to the map that will become the copy and press **T**. You can tag one or more maps to become copies. An asterisk appears next to the maps that have been tagged. **Reminder:** Use the **<Spacebar>**, **<Backspace>**, or **arrow keys** to move up and down the list of maps.
 3. Move the cursor to the map that will be used as the source and press **C**.
 4. Confirm the copy action. The DACS II AX displays: "Copy map X to the tagged maps? Are you sure (Y/N)?" When the copy completes, the message "Mapfile copy completed" appears. Press **any key** to continue.
 5. If you want to make changes to one of the copies, move the cursor to the map and press **<Enter>**.
-

Map Definition Submenu

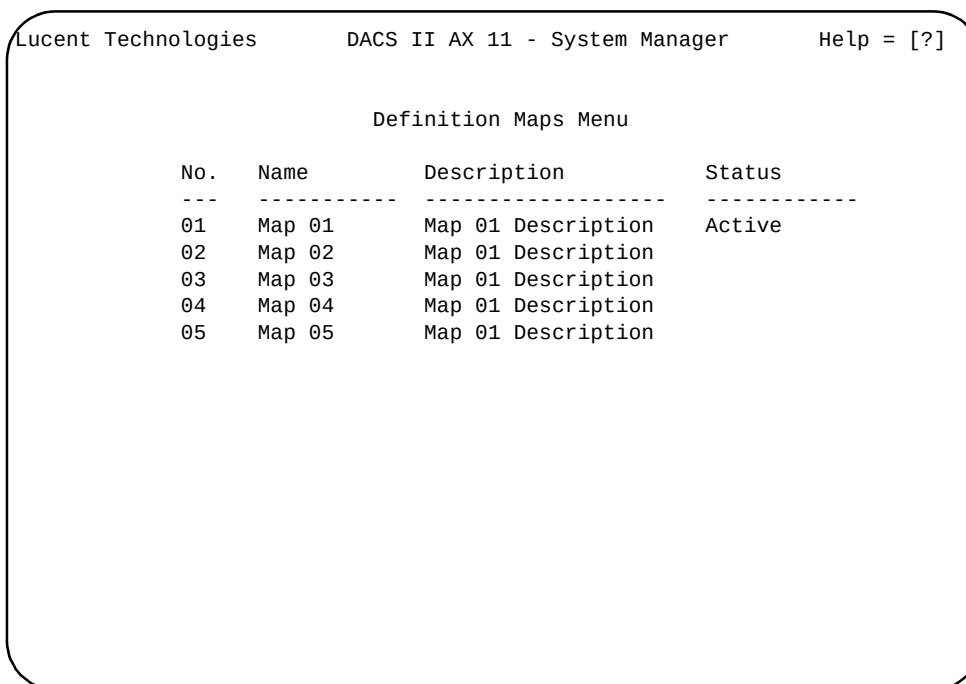
Assigning a Map Name and Description

The Map Definition Submenu allows you to assign a name and description to each of the five connection maps. A read-only Status field is also displayed that shows which map is active at the current time.

Procedure

To assign a name and description to a map:

1. From the DACS II AX Main Menu, select *Connection Maps Manager*, then select *Map Definition*. The Definition Maps Menu is displayed.



No.	Name	Description	Status
01	Map 01	Map 01 Description	Active
02	Map 02	Map 01 Description	
03	Map 03	Map 01 Description	
04	Map 04	Map 01 Description	
05	Map 05	Map 01 Description	

Figure 5-21. Definition Maps Menu

2. Move your cursor to the map that you wish to define and press **<Enter>**.
3. Type in the new Map Name and Description.
4. Press **X**. Changes are saved and you return to the Connection Maps Manager Menu.

Time of Day Configuration Submenu

The Time of Day Configuration Submenu allows you to set up a mapping schedule for the week. Maps can be activated at different times during the day to allow for increased or decreased traffic. For example, you could have a daytime map with more voice than data connections and then a nighttime map with more data than voice connections. For each day, you can schedule up to five maps.

Scheduling Maps

You can create a schedule for the week that includes:

- When a map is to be activated
- The Map Name

Each day can include up to five entries.

To activate a map manually, refer to the section "Activating a Map".

Procedure

To configure the time of day manager:

1. From the DACS II AX Main Menu, select *Connections Map Manager*, then select *Map Configuration*. Select *Time of Day Configuration*. The Time of Day Configuration Menu appears.

Lucent Technologies
DACS II AX 11 - System Manager

Monday , April 31 09:03

Time Of Day Configuration Manager
Enabled:No
ActiveMap:Map 05

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
00:00	00:00	00:00	00:00	15:20	00:00	00:00
...	...	...	...	Data 64k/v	...	...
00:00	00:00	00:00	00:00	15:25	00:00	00:00
...	...	...	...	Full Set	...	...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...	...	...	...	...	...	...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...	...	...	...	...	...	...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...	...	...	...	...	...	...

Figure 5-22. Time of Day Configuration Manager Menu

- Check the day, date and time appearing at the top of this screen. If it does not match the current day, date and time, go to the Date and Time menu and correct it immediately. Otherwise, your maps may be activated at the wrong times. See "Setting the Date and Time" for details.
- For each day, there are five blocks. The time is entered in 24-hour notation. To schedule a map for activation, move your cursor to the block that you wish to configure. With your cursor on the "hours" field, press **<Enter>** until the desired hour appears. Use the spacebar to move to the "minutes" field, and press **<Enter>** until the desired minute appears. Use the spacebar once again to move to the field below the time field, and press **<Enter>** to select the Map Name that you wish to activate at the time you selected.

**NOTE:**

There must be at least two entries - a "switch to" time and a "switch back to" time. If there is only one entry, the manager will switch to the scheduled map immediately after saving the configuration.

4. To save changes, press **X**.
 5. When prompted: "Update Configuration? Are you sure (Y/N)?" press **Y**.
-

**Scheduling Maps
Field Descriptions**

Active Map: This is a read-only field. It shows which map, if any, is currently active.

Enabled: Indicated if the time of day configuration feature has been enabled. If "Yes," the connection maps will be activated at the pre-set times. If "No," the schedule is blank. If the Time of Day feature is enabled, the new configuration will take effect as soon as this configuration is completed.

Day Entries (00:00): (Option field) Select the time when the map is to be activated. Select hours and minutes. 24-hour notation is used.

Map Name (...): (Option field) Select the name of the map to be activated. Map names are defined in the Map Definition Menu. Use the default, or enter a name of your choosing. See "Assigning a Map Name and Description" earlier in this chapter.

Lucent Technologies
DACS II AX 11 - System Manager
Monday, April 31 09:03
Time Of Day Configuration Manager
Enabled:No
ActiveMap:Map 05

Sun	Mon	Tues	Wednes	Thurs	Fri	Sat
06:00	06:00	06:00	06:00	06:00	06:00	06:00
Daily	Daily	Daily	Daily	Daily	Daily	Daily
20:00	20:00	10:00	20:00	20:00	20:00	20:00
Night	Night	Special	Night	Night	Night	Night
00:00	00:00	12:00	00:00	00:00	00:00	00:00
...	...	Daily	...	...	...	...
00:00	00:00	20:00	00:00	00:00	00:00	00:00
...	...	Night	...	...	...	...
00:00	00:00	00:00	00:00	00:00	00:00	00:00
...	...	...	...	...	...	...

yy

Figure 5-23. Sample Schedule Screen

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Background

An event is the report of an occurrence in the DACS II AX. The DACS II AX generates events for reasons such as, switchovers, test commands, and system changes. The DACS II AX maintains a log for approximately 128 of the most recent events. When an event occurs, it is time and date stamped and assigned a sequence number. It may also have an Audit Trail Identifier, which can be set up from the User Menu. The slot associated with the event as well as a description of the event is recorded.

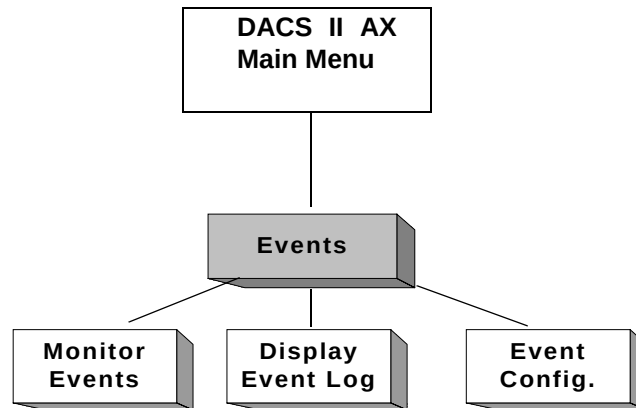


Figure 6-1. Events Menu Structure

Accessing the Events Menu

Procedure

To access the Events menu:

1. Select *Events* from the *DACS II AX Main Menu*.
2. Place your cursor on the *Events* field and press **<Enter>**. The following menu appears (Figure 6-2).

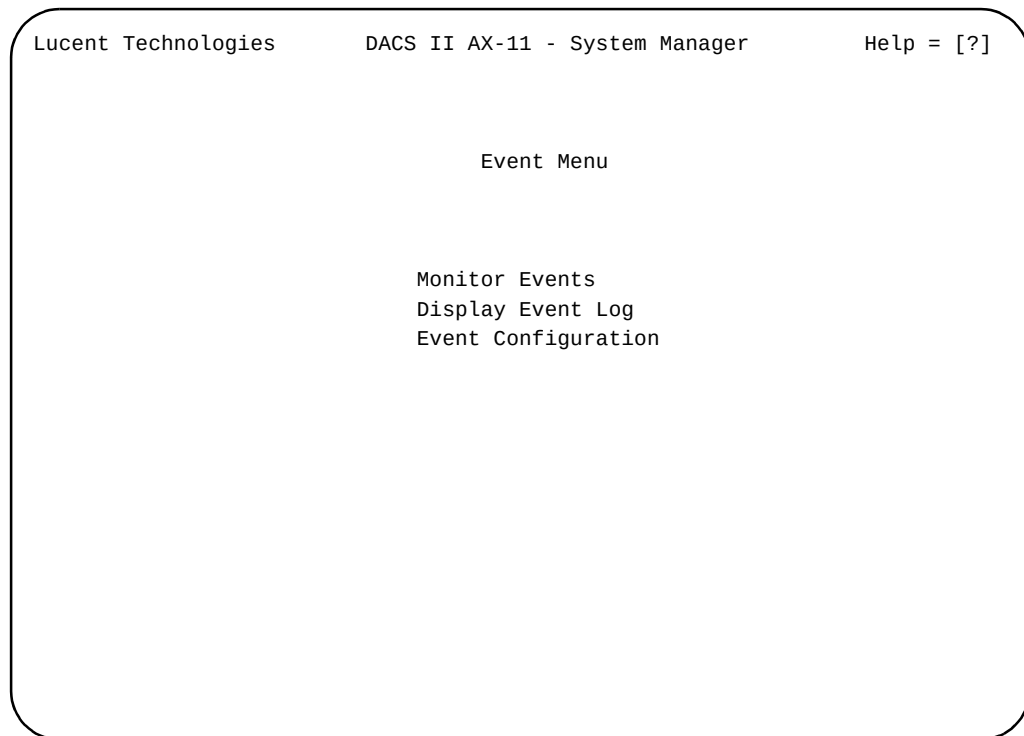


Figure 6-2. Events Menu

Monitor Events

Purpose

You can monitor events as they occur in the DACS II AX. One screen of events is displayed. New events are added, approximately every 10 seconds, to the top of the list as they occur. You can clear the event log from this screen.

Procedure

To monitor events on the DACS II AX:

1. From the DACS II AX Main Menu, place your cursor on the *Events* field and press **<Enter>**.
2. Then place your cursor on the *Monitor Events* field and press **<Enter>**.
The following screen appears (Figure 6-3):

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]

                                System Events

Seq  Time  Date  Slot  Event
---  ----  ----  ----  -----
0180 14:24 02/09 SMCB  LOGIN user - admin (login total: 1)
0179 17:23 02/08 SMCB  LOGOUT user - admin (login remains: 0)
0178 13:33 02/08 SMCB  LOGIN user - admin (login total: 1)
0177 12:20 02/08 SMCB  LOGOUT user - admin (login remains: 0)
0176 12:07 02/08 SMCB  LOGOUT user - admin (login remains: 1)
0175 11:54 02/08 SMCB  LOGIN user - admin (login total: 2)
0174 11:53 02/08 SMCB  SMCA present
0173 11:53 02/08 SMCB  Slot SMCA not responding
0172 11:52 02/08 SMCB  File System, copy completed
0171 11:50 02/08 SMCB  LOGOUT user - admin (login remains: 1)
0170 11:49 02/08 SMCB  A/L >> File System, copy started
0169 11:45 02/08 0011  CfgMgr, Nx1 redundancy loaded default config
0168 11:45 02/08 0011  Device is in standby state
0167 11:45 02/08 0001  CfgMgr, N+1 redundancy loaded default configuration
0166 11:45 02/08 0001  Device is in standby state

[C]lear event log          >> indicates Audit Trail Event

```

Figure 6-3. System Events Menu

Monitor Events (Continued)

3. To clear the content from the Event Log, press **C** and confirm.
>> indicates an Audit Trail Event. It is used to track a user's operation of the system. For more details about the Audit Trail Event, refer to the *User Configuration Menu* in Chapter 4.
 4. To exit the screen and return to the previous menu, press **X** or press the **Esc key** twice.
-

Display Event Log

Purpose

Display the Event Log to show the most recent events that have occurred on the DACS II AX. Events that occur while displaying the Event Log are added to the event log but not updated on the screen. You can not clear the log from this screen.

Procedure

To display the Event Log:

1. From the Main Menu, place your cursor on the *Events* field and press **<Enter>**.
2. Then place your cursor on the *Display Event Log* field and press **<Enter>**. The Event Log displays (Figure 6-4).

```
Seq  Time  Date  Slot  Event
---  ---  ---  ---  -----
0078 10:27 01/20 SMCA  LOGIN user - DefaultUser (login total: 1)
0077 17:51 01/19 SMCA  LOGOUT user - DefaultUser (login remains: 0)
0076 17:43 01/19 SMCA  LOGIN user - DefaultUser (login total: 1)
0075 17:03 01/19 SMCA  LOGOUT user - DefaultUser (login remains: 0)
0074 16:53 01/19 0007  T1/E1 - Saving configuration file
0073 16:51 01/19 SMCA  LOGOUT user - DefaultUser (login remains: 1)
0072 16:51 01/19 0007  Port 8 in Red Alarm
0071 16:51 01/19 0007  Port 7 in Red Alarm
0070 16:51 01/19 0007  Port 6 in Red Alarm
0069 16:51 01/19 0007  Port 5 in Red Alarm
0068 16:51 01/19 0007  Port 4 in Red Alarm
0067 16:51 01/19 0007  Port 3 in Red Alarm
0066 16:51 01/19 0007  Port 2 in Red Alarm
0065 16:51 01/19 0007  Port 1 in Red Alarm
0064 16:51 01/19 0007  Device Up and Running
0063 16:51 01/19 0007  Device is in standby state
0062 16:51 01/19 0007  Device Reset
0061 16:51 01/19 SMCA  Card in slot 0007 present
0060 16:51 01/19 SMCA  Slot 0007 not responding
0059 16:51 01/19 0001  Port 8 in Red Alarm
Press any key to continue...
```

Figure 6-4. Event Log

Display Event Log (Continued)

Procedure (Continued)

3. To exit the screen and return to the previous menu, *press any key to continue* until you have scrolled through all of the events in the log. You can also press **<Esc>** at any time to exit the *Display Event Log* menu.
-

Event Configuration

Purpose You can send the events that occur on the DACS II AX to a personal computer or workstation.

Before You Begin You must have the SysLog (a UNIX utility) program running on your PC or workstation to perform this function.

Procedure To send events to syslog on a remote host:

1. From the Main Menu, place your cursor on the *Events* field and press **<Enter>**.
2. Then place your cursor on the *Event Configuration* field and press **<Enter>**. The Event Configuration menu displays (Figure 6-5).

The screenshot shows a terminal window titled "Lucent Technologies DACS II AX-11 - System Manager Help = [?]". The main content is the "Event Configuration Menu". It displays three configuration options: "Log events to syslog....: Yes", "Syslog server IP address: 0.0.0.0", and "Identifier.....: AX #3".

```
Lucent Technologies      DACS II AX-11 - System Manager      Help = [?]  
  
                          Event Configuration Menu  
  
                          Log events to syslog....: Yes  
                          Syslog server IP address: 0.0.0.0  
                          Identifier.....: AX #3
```

Figure 6-5. Event Configuration Menu

Event Configuration (Continued)

Procedure (Continued)

3. To send log events to a remote host, select **Yes** in the **Log events to syslog** field. Specify the Syslog server IP address in dot notation and the identifier for the DACS II AX.
 4. Press **X** and confirm action when prompted, by pressing **Y**. Changes are saved and you return to the previous menu.
-

Event Configuration Field Descriptions

Log events to syslog: Select **Yes** or **No** to send the event data to a host PC or workstation.

Syslog server IP Address: This is the host address where you want to send the event data.

Identifier: Identifies the specific DACS II AX unit from which the information is being sent.

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Background

Overview

**WARNING:**

Use caution when initiating Utilities Menu commands. Some of these commands are service-affecting.

The Utilities Menu provides options that enable you to:

- run diagnostic utilities for debugging purposes
- manually copy the file system to the standby SMC
- switchover System Manager Cards (SMCs)
- download software
- return the system to default settings

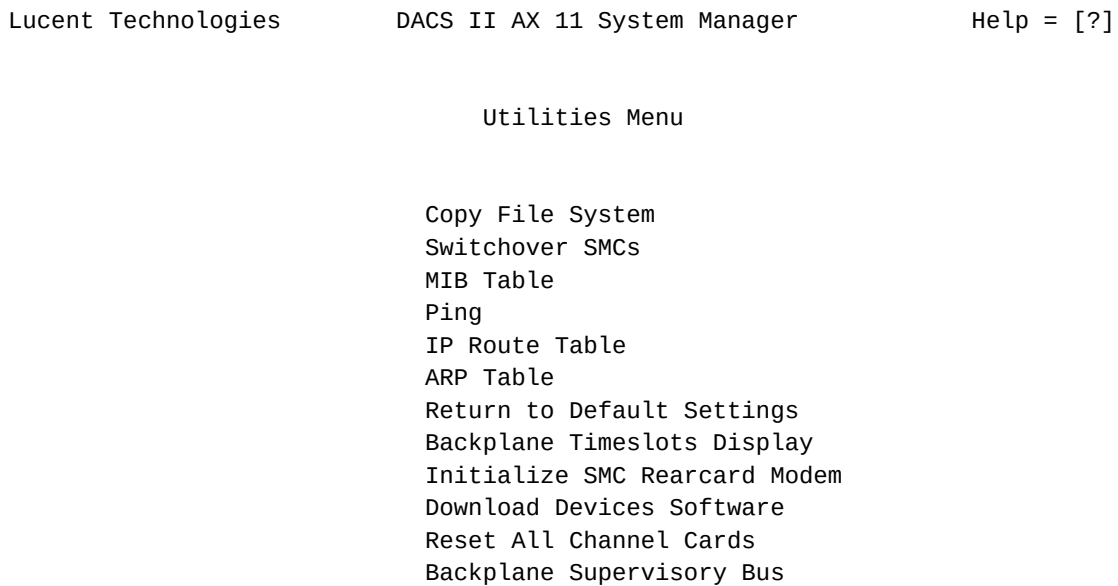
Before you begin

Reminder: To activate the values that you enter or select on the configuration screens, you must exit the screen. Diagnostic parameters are activated immediately, as soon as you change the value on the screen.

Utilities Menu

Accessing the Utilities Menu

To access the Utilities menu, select Utilities from the AX Main Menu. The Utilities Menu displays (Figure 7-1).



```
Lucent Technologies      DACS II AX 11 System Manager      Help = [?]  
  
                          Utilities Menu  
  
                          Copy File System  
                          Switchover SMCs  
                          MIB Table  
                          Ping  
                          IP Route Table  
                          ARP Table  
                          Return to Default Settings  
                          Backplane Timeslots Display  
                          Initialize SMC Rearcard Modem  
                          Download Devices Software  
                          Reset All Channel Cards  
                          Backplane Supervisory Bus
```

Figure 7-1. Utilities Menu

Copy Files to Standby SMC

Description

If you have two System Manager Cards, the DACS II AX automatically copies files from the online SMC to the standby SMC periodically, so that the two file systems are identical.

You can also manually copy the file system from the online SMC to the standby SMC. For example, you may want to copy the file system when you have made many changes and you want to update the standby SMC immediately.

When the message "Database out of sync" displays at the top of the left side of the screen, copy the database to the standby SMC.

Related tasks

To switch manually to the Standby System Manager Card, choose the Switchover SMCs option from the Utilities menu.

Copy Files to Standby SMC (Continued)

Procedure

To copy the configuration files from the on-line SMC to the standby SMC:

1. From the AX Main Menu, select Utilities, then select Copy File System. This message displays: Copy files to offline SMC?

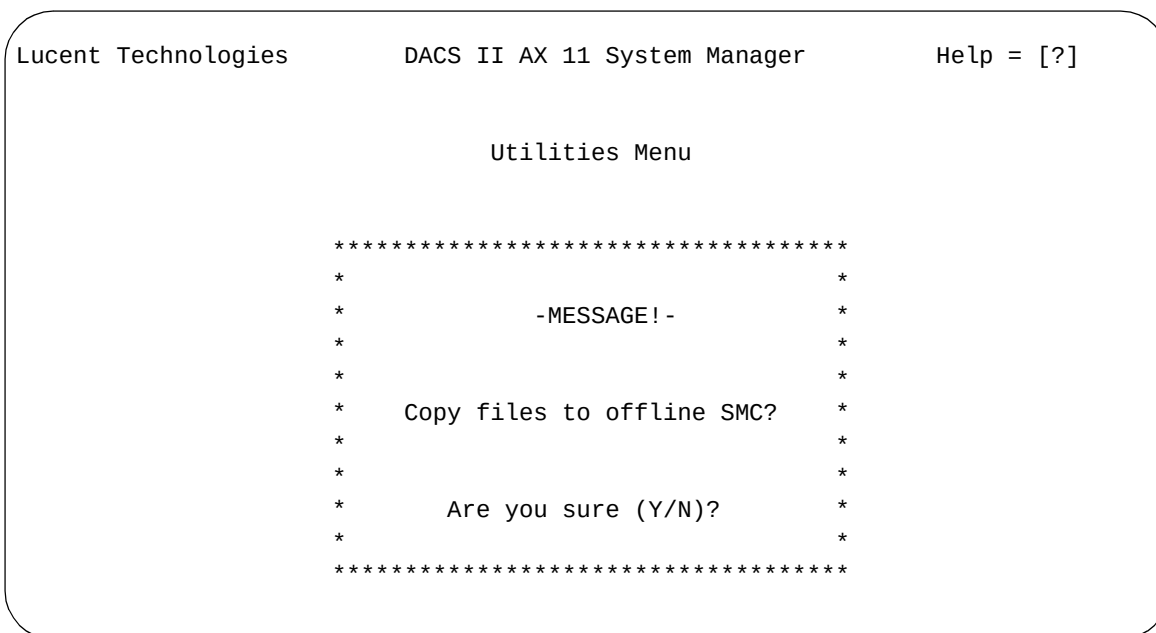


Figure 7-2. Copy File System Menu

2. Type Y.

All configuration files are copied to the Standby System Manager Card. When the configuration files have been copied, the Standby System Manager Card resets.

The length of time needed to complete the copy operation, depends on the size of the database.

Switchover SMCs

Description

This procedure applies only if you have two SMCs in the DACS II AX system.

The standby SMC is automatically switched in should the "online" unit fail. You can also switch manually to the standby SMC by choosing the Switchover SMCs option from the Utilities menu.

Procedure

To manually switch to the Standby SMC:

1. From the AX Main Menu, select Utilities, then select Switchover SMCs. This message displays: Switchover SMCs?

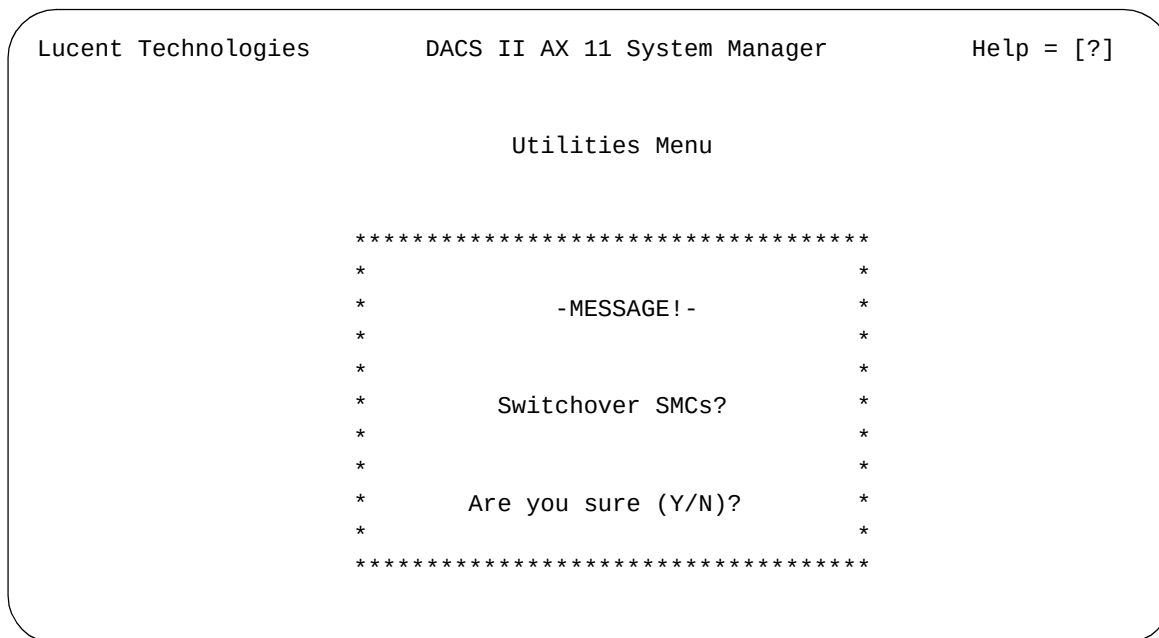


Figure 7-3. Switchover SMC Menu

2. Type **Y**.

The standby SMC goes "on-line" (*becomes active*), and the on-line System Manager Card goes "off-line" (*becomes inactive*). You will lose your telnet or terminal session.

3. Press <Enter> to get the Login prompt from a locally-connected terminal, or re-establish a telnet session to log back in to the DACS II AX.

MIB Table

Description

Use the MIB Table diagnostic utility to display read-only diagnostics of network activity. The MIB display is significant for those running IP traffic. The table displays the MIB-II parameters as defined in RFC1213.

Procedure

To access the MIB Table diagnostic utility:

1. From the AX Main Menu, select Utilities, then select MIB Table.

The MIB Display is shown (Figure 7-4).

```

MIB II display...
***** IP variables *****
ipInReceives...:    984439 ipInHdrError:      0 ipInAddrErrors:      0
ipForwDatagrams:    0 ipInDiscards:      0 ipInDelivers:      966199
ipUnknownProtos:    0 ipOutRequest:    216902 ipOutDiscard:      0
ipOutNoRoutes...:   36522 ipReasmOKs :      0 ipReasmFails:      0
***** ICMP variables *****
icmpInMsgs.....:    13 icmpInErrors:      0 icmpInDestUnreac:    13
icmpInTimeExcds:    0 icmpInParmPr:      0 icmpInSrcQuenchs:    0
icmpInEchos....:    0 icmpInEchoRp:      0 icmpInTimestamps:    0
icmpInTstampRep:    0 icmpInAddrMa:      0 icmpInAddrMaskRe:    0
icmpOutMsgs.....:   18261 icmpOutError:      0 icmpOutDestUnrea:   18261
icmpOutTimeExcd:    0 icmpOutParmP:      0 icmpOutSrcQuench:    0
icmpOutRedirect:    0 icmpOutEchos:      0 icmpOutEchoReps :    0
icmpOutTimestam:    0 icmpTimesRep:      0 icmpOutAddrMasks:    0
icmpOutAddrMaRe:    0
***** UDP variables *****
udpInDatagrams.:    965512 udpNoPorts :      0 udpInErrors :      0
udpOutDatagrams:    197949
Press any key to continue...

```

Figure 7-4. MIB Display

2. Press any key to display more of the MIB display.

Ping

Description

The ping command enables you to send a message to an IP address and check for LAN connectivity. The ping command sends a datagram to the remote system and waits for a response.

Procedure

To access the Ping utility:

1. From the AX Main Menu, select Utilities, then select Ping.

The Ping Menu displays (Figure 7-5).

```
Lucent Technologies      DACS II AX 11 System Manager      Help = [?]  
  
                          Ping Menu  
  
                          Ping Setup  
                          -----  
Node IP address.....: 0.0.0.0  
Ping count.....: 1  
Number of bytes.....: 64  
  
                          Ping Statistics  
                          -----  
Pings sent.....: 0  
Pings received.....: 0  
Bytes received.....: 0  
Roundtrip delay(ms): 0  
Percent loss.....: 0.0 %  
  
[S]tart/Stop pinging
```

Figure 7-5. Ping Menu Display

Ping (Continued)

Procedure (Continued)

2. Enter the Node address, Ping count, and Number of bytes, then type **S**.
The unit responds with ping statistics. The screen will show the number of pings sent and received (echoed back) from the IP address, and the length of time, in milliseconds, that it took for the echo request message to be sent to the IP address and the echo reply message to be returned to the AX System Manager. If the count is 0, the trip was accomplished in less than 10 ms.
 3. Type **S** to stop ping.
 4. Press **Esc** to return to the previous menu.
-

Ping Fields

Node IP address: The IP address you want to ping. The address is entered in dotted decimal notation.

Ping count: The number of times you want to ping the defined address. Valid values are 1, 10, 100, 1000, or continuous.

Number of bytes: The optional length (in bytes) of the ping message you plan to send. This is used to verify that the receiving end can receive a packet of the defined size. The values are 10, 64, 100, 1000. The default is 64.

Ping Statistics:

- The number of **pings sent**.
 - The number of **pings received**.
 - The number of **bytes received**.
 - **Round trip delay** is the amount of time, measured in milliseconds, that it took to receive a response.
 - **Percentage loss** is the number of pings that did not respond.
-

IP Route Table

Description

The IP Route Table is used to route a datagram from the DACS II AX and send it to its next hop. Select Show IP route to show a specific route for an individual destination. Select Dump IP route table for a listing of every destination address and the route each takes.

Procedure

To access the IP Route Table diagnostic utility:

1. From the AX Main Menu, select Utilities, then select IP Route Table.

The IP Route Table Menu displays (Figure 7-6).

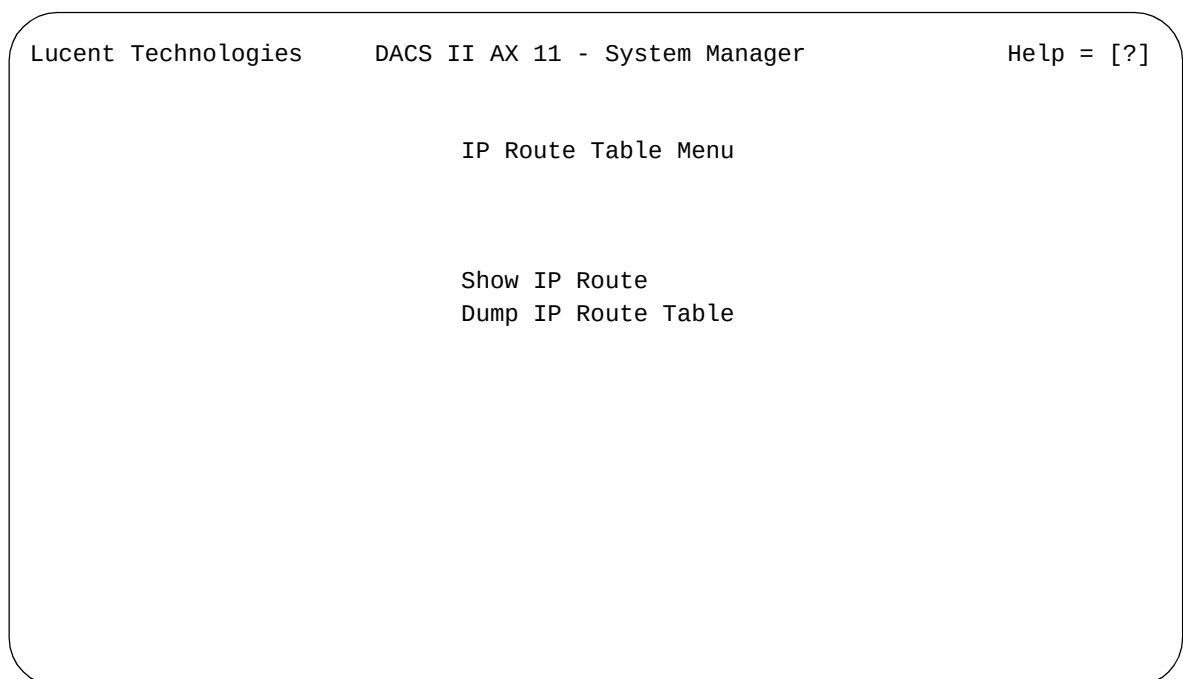


Figure 7-6. IP Route Table Menu

Procedure (Continued)

- Requested route:** This field allows you to request routing information for a specific destination network address or a specific host address. Enter the requested route address in dotted decimal notation (Figure 7-7).

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
```

Show IP Route Menu

```
Requested route.: 0.0.0.0
Route.....:
Mask.....:
Next hop.....:
Port.....:
Hops.....: 0
TimeToLive.....:
```

Figure 7-7. Show IP Route Menu

IP Route Table (Continued)

Procedure (Continued)

3. If you select Dump IP Route (Figure 7-8), enter the Route/Address.

Route/Address: This address is the destination network address or a specific host IP address.

IP route table display...

Address	Mask	Next Hop	Port	Hops	TimeToLive
-----	----	-----	----	----	-----
200.0.0.128	255.255.255.255	Direct	Internal	0	Forever
200.0.0.252	255.255.255.255	Direct	Internal	0	Forever
200.0.0.253	255.255.255.255	Direct	Internal	0	Forever
200.0.0.122	255.255.255.255	Direct	Internal	0	Forever
200.0.0.0	255.255.255.0	Direct	1	0	180
207.124.164.37	255.255.255.255	Direct	Internal	0	Forever
207.124.164.0	255.255.255.0	Direct	0	0	180

Press any key to continue...

Figure 7-8. Dump IP Route

4. Press **Esc** to return to the previous menu.

IP Route Table (Continued)

IP Route Fields

Mask: This address is generated automatically and is represented in "dotted decimal notation."

Next Hop: This is the IP address to which an IP frame is to be forwarded. The network portion matches the network portion of the DACS II AX port. The next hop is represented in "dotted decimal notation." *Direct* means there is no routing necessary since the address is on the same LAN segment.

Port: This field identifies the port from which the datagram is sent. If it is set to 0, the port is a logical port. If it is set to *"internal,"* it represents the DACS II AX address.

Hops: This field represents the number of hops required to reach the remote IP network. The range is from 0-15.

Time To Live: This count represents the amount of time (in seconds) that an address can remain inactive before it is deleted. If the field is set to *Forever* the address will not be deleted; it has been entered manually and will not age.

ARP Table

Description

ARP stands for Address Resolution Protocol as defined by RFC826. ARP is used to obtain the physical layer address associated with the IP address. Mapping is created between the physical and IP addresses. The physical addresses are dynamically discovered.

Procedure

To access the ARP table diagnostic utility:

1. From the AX Main Menu, select Utilities, then select ARP Table.

The ARP Table Menu displays (Figure 7-9).

```
ARP table display...
Protocol Address    Hardware Address    State    TimeToLive
-----
192.168.210.5       00:20:54:30:01:35   Resolved   600
192.168.210.120     52:54:00:da:2e:57   Resolved   521
192.168.210.100     00:a0:24:a9:55:24   Resolved   593

Press any key to continue...
```

Figure 7-9. ARP Table Utility Display

2. Press any key to continue.
-

ARP Table (Continued)

ARP Table Fields

Protocol Address: This is the IP address.

Hardware Address: This is the physical address associated with the IP address.

State: The State is either "pending" or "resolved".

- If the DACS II AX is in a "*pending*" state, the ARP request has been sent and the DACS II AX is waiting for an ARP reply message.
- If the IP Address matches up with the physical address, then the state has been "*resolved*".

Time To Live: This count represents the amount of time (in seconds) that the address can remain inactive before it will be deleted. The maximum count is 10 minutes (600 seconds).

Return to Default Settings

Description

**CAUTION:**

This command is service-affecting and should only be performed by a Lucent technical support representative.

The Return to Default Settings option does the following:

- Resets the system configuration
- Erases the flash system
- Reformats and initializes the flash memory
- Creates default configuration files. Any system configurations that were entered, will be erased.

This procedure defaults the online SMC only. To default the standby SMC, switchover SMCs and repeat the procedure.

Before You Begin

**WARNING:**

Return to Default Settings removes the IP Address from the LAN port. You will not be able to access the DACS II AX from the LAN after executing Return to Default Settings. After defaulting the SMC, the only access to the DACS II AX is via the local terminal or the modem port, through which you can re-enter an IP Address. Do not default the system from a remote location unless you also have modem access.

Return to Default Settings (Continued)

Procedure

To reset the system configuration to default settings:

1. From the AX Main Menu, select Utilities, then select Return to Default Settings.

This message displays: Reset configuration?

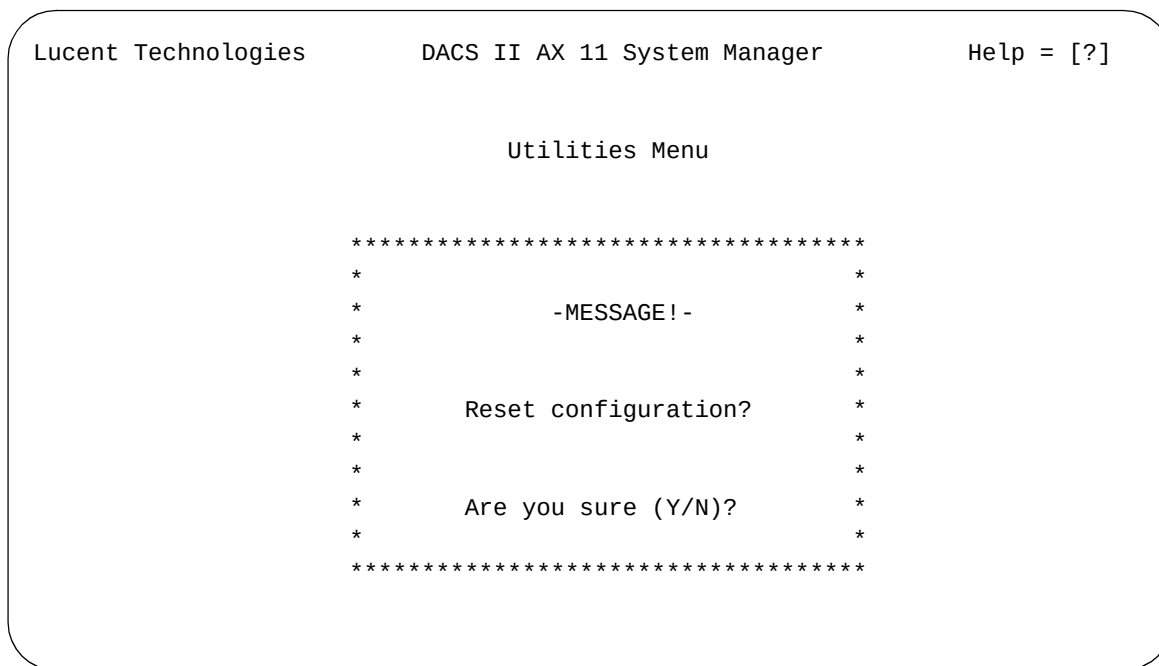


Figure 7-10. Default Settings Display

2. Type **Y**. The system returns to the default settings.

Backplane Timeslots Display

Description

The Backplane Timeslots Display is a read-only diagnostic utility which provides a detailed list of all of the configured connections in the system. Each connection is defined by its backplane timeslot number (BTS), connection ID number (Cid), physical slot (Sl), port (Po) and time slot assignment (Ts), and connection name. In addition, each connection is also given a "flag" which further defines the connection as a "write to" or "read-from" connection, as a "destination" or "source" connection, and as a "data" or "voice" connection. When using the Test Access module, the flag also provides the tester slot and port as well as the bus associated with each connection.

The flag is defined as follows:

WDda#(00.00) where:
<i>the first character is a capital W or R and:</i> W = Write to Backplane R = Read from Backplane;
<i>the second character is a capital D or S and:</i> D = Destination S = Source;
<i>the third character is a lower-case d or v and:</i> d = data v = voice;
<i>the fourth character is a lower-case a or b and:</i> a = bus a b = bus b;
<i>the fifth character is the number of bits (7 or 8);</i>
<i>the last characters (in parentheses) represent the tested slot and port numbers.</i>

Backplane Timeslots Display (Continued)

Procedure

To see the Backplane Timeslots Display:

1. From the AX Main Menu, select Utilities, then select Backplane Timeslots Display

The Backplane Timeslots Display is shown (Figure 7-11).

```
----- AX Backplane Timeslot Map Id = 3 Version =50 .-----
----- Bus A Bts Writers and Readers Groups -----
BTS  Cid  Sl Po Ts Flags          Connection Name
0087 0002 01.03.01 WSda7(00.00)    QT1-1.3 TO QT1-1.1V
0087 0002 01.01.01 RDda7(00.00)    QT1-1.3 TO QT1-1.1V
-----
0088 0002 01.01.01 WDda7(00.00)    QT1-1.3 TO QT1-1.1V
0088 0002 01.03.01 RSda7(00.00)    QT1-1.3 TO QT1-1.1V
-----
0089 0002 01.03.03 WSda7(00.00)    QT1-1.3 TO QT1-1.1V
0089 0002 01.01.03 RDda7(00.00)    QT1-1.3 TO QT1-1.1V
-----
0090 0002 01.01.03 WDda7(00.00)    QT1-1.3 TO QT1-1.1V
0090 0002 01.03.03 RSda7(00.00)    QT1-1.3 TO QT1-1.1V
-----
0091 0002 01.03.05 WSda7(00.00)    QT1-1.3 TO QT1-1.1V
0091 0002 01.01.05 RDda7(00.00)    QT1-1.3 TO QT1-1.1V
-----
0092 0002 01.01.05 WDda7(00.00)    QT1-1.3 TO QT1-1.1V
0092 0002 01.03.05 RSda7(00.00)    QT1-1.3 TO QT1-1.1V
-----

press <CR> to continue - any other key to exit.
```

Figure 7-11. Backplane Timeslots Display

2. Press **Enter** to continue displaying backplane timeslots or press any other key to exit.

Initialize SMC Rear Card Modem

Description

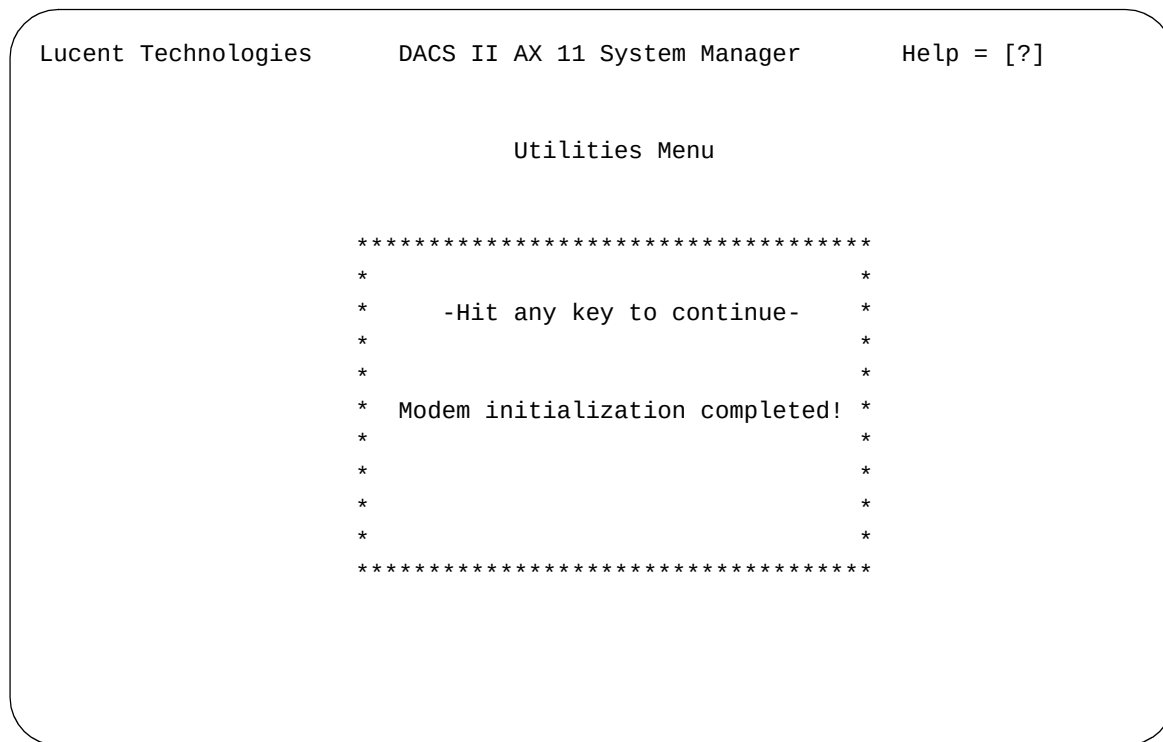
The SMC has a built-in modem which can be used for remote configuration or for technical support. You may want to initialize the modem before use, or if it becomes hung up and not responding.

Procedure

To initialize the SMC rear card modem:

1. From the AX Main Menu, select Utilities, then select Initialize SMC Rear Card Modem.

The command executes immediately and then displays the message:
Modem initialization complete.



```
Lucent Technologies      DACS II AX 11 System Manager      Help = [?]  
  
                          Utilities Menu  
  
*****  
*                                                                    *  
*      -Hit any key to continue-      *  
*                                                                    *  
*                                                                    *  
*      Modem initialization completed!  *  
*                                                                    *  
*                                                                    *  
*                                                                    *  
*                                                                    *  
*                                                                    *  
*****
```

Figure 7-12. Initialize SMC Rear Card Modem

Download Devices Software

Description

The Download Devices Software option allows you to download application module program files from the SMC to any or all of the application modules.

**Related
Information**

The procedures for downloading software to the SMC and to the application modules are included in Appendix A, TFTP/Telnet.

Reset All Channel Cards

Description

This option resets all of the application modules resident in the DACS II AX.



CAUTION:

This command is be service-affecting and should only be performed by a Lucent technical support representative.

Before you begin

Before resetting all channel cards, return the system to its default settings.

Procedure

To reset all of the application modules in the AX:

1. From the AX Main Menu, select Utilities, then select Reset All Channel Cards. This message displays: Reset all AX channel cards?

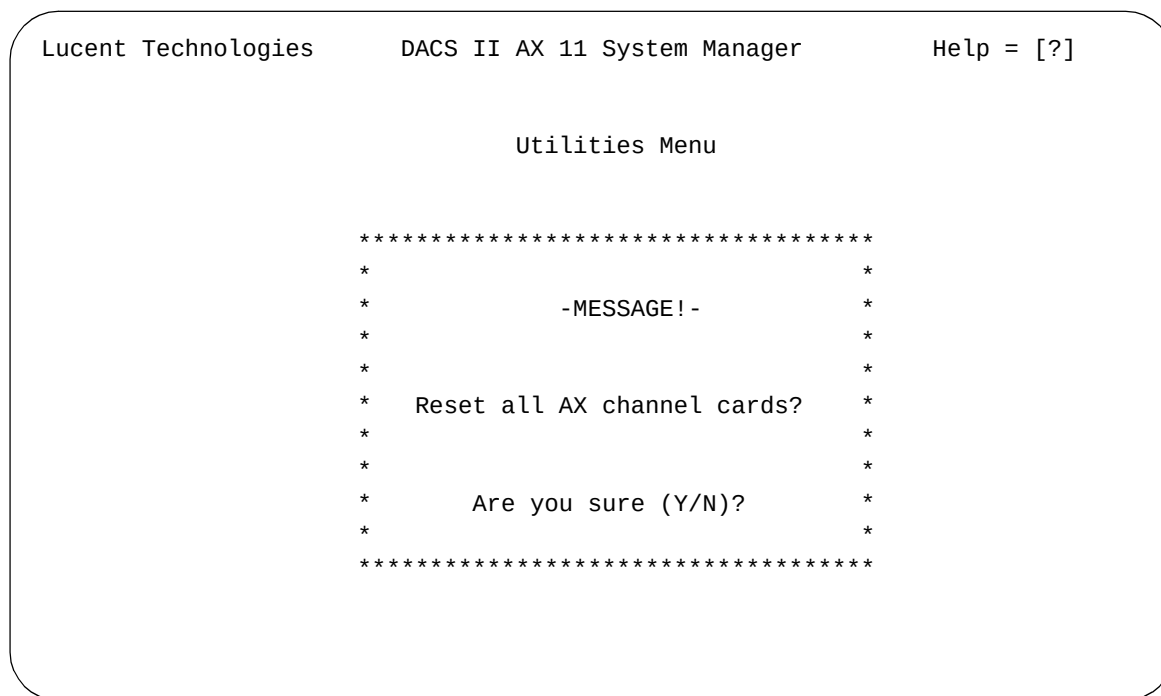


Figure 7-13. Reset All Channel Cards

2. Type **Y**. The system resets all channel cards.

Backplane Supervisory Bus Submenu

The backplane supervisory bus is the pathway over which the SMC and device cards communicate with each other.

Procedure

To adjust the speed of the Supervisory Bus B:

1. From the DACS II AX Main Menu, place your cursor on the *Utilities* field and press **<Enter>**. The following screen appears:

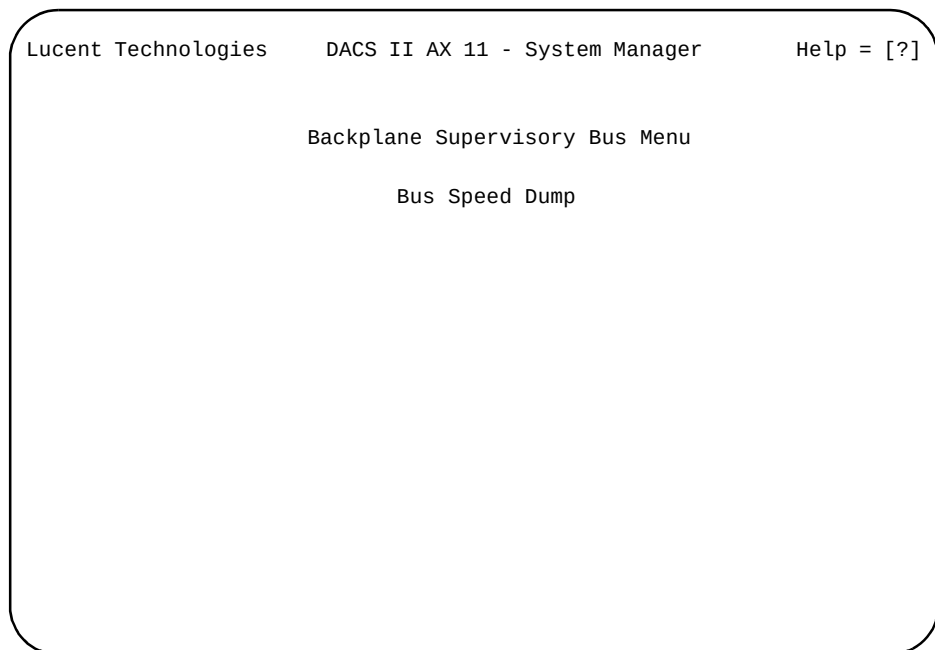


Figure 7-14. Backplane Supervisory Bus - Utilities Menu

2. Then place your cursor on the *Bus Speed Dump* field and press **<Enter>**. The following screen appears:

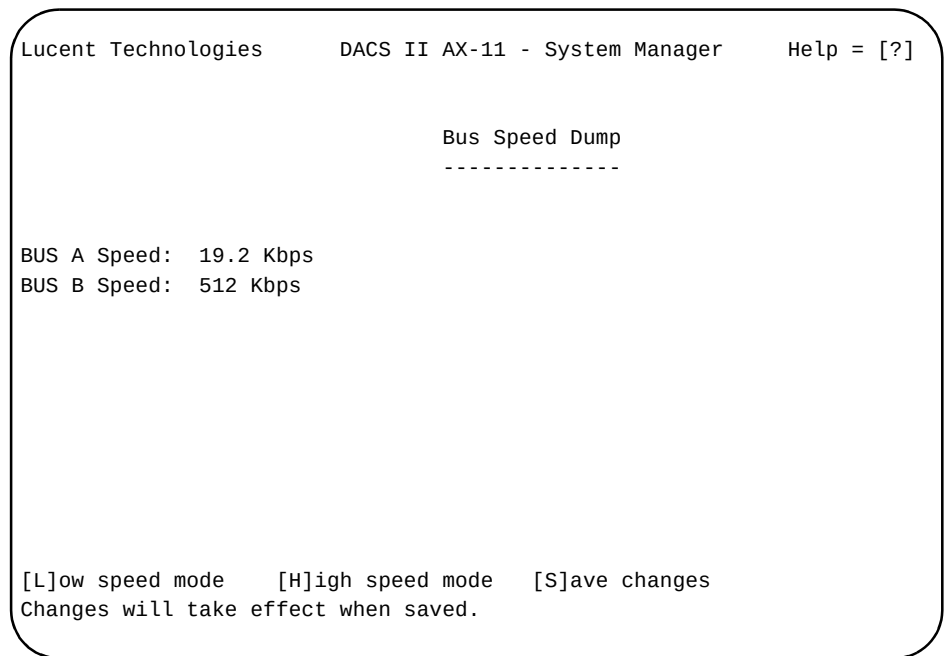


Figure 7-15. Bus Speed Dump Submenu

3. Although the cursor will blink on the *BUS A Speed* field, no changes can be made here. Press "**L**" to change the speed on Bus B to low or 19.2 Kbps. Press "**H**" to change the speed to high or 512 Kbps.
4. Press "**S**" to save your changes. You will, however, remain in the *Bus Speed Dump* screen.
5. Press "**X**" to exit this screen and return to the previous menu.

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Background

Clocking is an extremely important element of a digital transmission system or network, and it is used to provide timing information to the equipment elements within that network. Interconnection of the clocks within a network assures that they are synchronized and operating at the same average frequency.

This chapter provides a description of the DACS II AX system clocking functions and how to configure them.

DACS II AX Clocking Sources

Clock Source

Clocking for the DACS II AX can be either network-synchronized or derived from the DACS II AX's internal clock. You can designate up to three reference clock sources: primary, secondary, and tertiary. The active clock source supplies timing for all of the cards in the DACS II AX.

Network Synchronized Timing

There are two kinds of network synchronized timing: line timing and external timing.

Line Timing

Line timing is provided by an outside source such as a telephone carrier. Line timing is used to synchronize timing with an incoming signal that is present on a selected slot and port on an application module. A slot number and port number uniquely identify the timing source.

Line Timing can be provided by any of the application modules listed in Table 8-1.

Table 8-1. Application Modules That Can be Used for Timing Source

Application Module	Ports
Octal T1/E1	1 through 8
Octal High Speed	1 through 8
Quad High Speed	Port 1 only
T3	T1 ports 1-28
STS-1	T1 ports 1-28
Hybrid DS-3	T1 ports 1-28 E1 ports 1-21
Quad T1	1 through 4

DACS II AX Clocking Sources (Continued)

Network Synchronized Timing (Continued)

External Timing

External timing can be provided by stand-alone reference timing equipment, such as a Building Integrated Timing Source (BITS) clock. The BITS clock (station clock) input is received via connectors located on the SMC II rear card. See Figure 8-1.

Two independent station clocks can be connected to the DACS II AX using the "Station Clock A" and "Station Clock B" connectors.

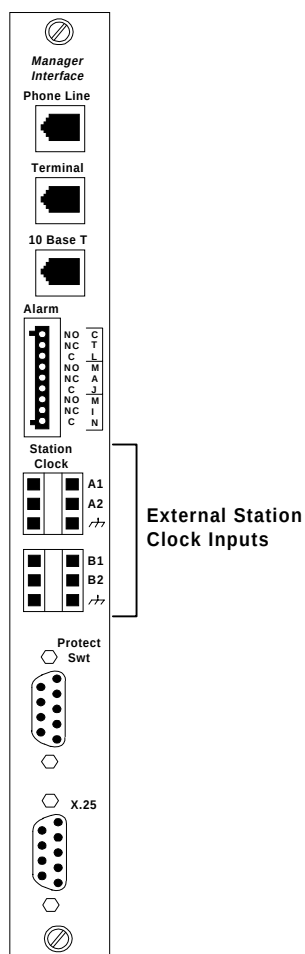


Figure 8-1. External Station Clock Inputs

DACS II AX Clocking Sources (Continued)

DACS II AX Internal Clock

The SMC II on the DACS II AX system includes an internal Stratum 3 clock, which is physically located on the SMC II front card. The internal Stratum 3 clock can be used as a reference to generate system clocking signals. It automatically has two modes: Hold Over Timing and Free Run.

The Stratum 3 clock will be used if you select Free Run as a clock source mode or no other clock source is available.

When the DACS II AX uses its internal Stratum 3 clock, it runs based on a history of external clock accuracy to calculate the average frequency of the external clock. When the Stratum 3 clock uses this method to operate, it is using Hold Over timing.

For Hold Over, average timing is calculated over a 24-hour time period. When link/external reference sources are not available, the internal Stratum 3 clock is used as a clock source in such a way that it can achieve calculated average frequency of the last-used timing source. If a 24-hour history is not available, Free Run mode is used as the default.

The SMC I has an internal Stratum 4 clock.

Clocking Example

Priority Scheme

Figure 8-2 shows the possible failure and recovery processes for the source clock used by the DACS II AX.

The black arrows indicate clock failure. The gray arrows indicate recovery when a more desirable clock than Hold Over or Free Run becomes available.

When Primary (1) Mode is selected, only the designated primary and Hold Over/Free Run clocks are available. If the primary clock fails, then the DACS II AX uses its internal clock.

Secondary (2) and Tertiary (3) Modes operate similarly. When Secondary (2) Mode is selected, only the designated secondary source and Hold Over/Free Run clocks are available. If the secondary clock fails, then the DACS II AX uses its internal clock.

When Tertiary (3) Mode is selected, only the designated tertiary source and Hold Over/Free Run clocks are available. If the tertiary clock fails, then the DACS II AX uses its internal clock.

Automatic ("A") Mode assesses all potential sources, in higher-to-lower level sequence, prior to abandoning a faulty clock reference (using Holdover to facilitate transition).

In Auto mode, the switching is non-reverting. This means that the line or external timing source will NOT automatically switch back to the previous link/external timing source should the previous timing source become available again. When the current source is still available and you wish to revert back to the original source, you must do so manually, then return to Auto mode.

Once a source becomes unavailable, the SMC II software will immediately switch to either **Hold Over** or **Free Run** mode in order to temporarily maintain system timing. **Hold Over** mode will be enabled if the clock source has been active for more than 24 hours; **Free Run** mode will be enabled if the clock source has been active for less than 24 hours. The SMC II software will re-check the availability of the primary, secondary, and tertiary sources in order. If one of these sources is available, it will be selected. If none of these sources are available, either **Hold Over** or **Free Run** will continue to be the clocking mode.

For every transition between clocking sources, no matter what the mode or direction, an event shall be logged and an SNMP trap issued.



Configuring the Source Clock

The System Clock Source Menu is used to configure the DACS II AX so that it uses a common clock source for all modules and connections. This synchronizes the Time Division Multiplexer (TDM) functions of the backplane. Three clock sources (Primary, Secondary, and Tertiary) can be configured.

Procedure

To configure the Source Clock:

1. From the Main Menu, place your cursor on the *System Configuration* field and press **<Enter>**.
2. Then place your cursor on the *System Source Clock* field and press **<Enter>**. The following menu appears:

```
Lucent Technologies      DACS II AX-11 System Manager      Help = [?]  
  
                        System Clock Source Menu  
  
Mode.....: Primary  
  
Primary....: Station Clock A          Port: NA  
Secondary...: 02 -                    Port: 04  
Tertiary...: Not Configured           Port: NA  
  
ACTIVE.....: Station Clock A          Port: NA      Primary
```

Figure 8-3. System Clock Source Menu

3. Select the mode by pressing **<Enter>** to cycle through the choices until the correct mode is displayed. If you are indicating *Auto*, *Primary*, *Secondary*, or *Tertiary* modes for line or external timing, you will also need to specify the slot and port number for each source. If you are indicating Free Run mode, proceed to step 5.

4. Select a slot and port number for each source of line or external timing. Move the cursor to the appropriate field and press **<Enter>** to cycle
NA displays in the Port field when the source is Station Clock A, Station Clock B, or Not Configured.
5. Once the clocking sources are completely configured, press **X** to exit. When prompted: "Update Configuration? Are you sure (Y/N)?" press **Y**.

**NOTE:**

After configuring the source clock, the display may indicate that the DACS II AX configuration databases are out of sync. This is a normal condition when performing updates, and will clear up momentarily.

System Clock Source Field Descriptions

Mode: Determines whether the DACS II AX uses line and/or external timing, or uses its own internal clock (**Free Run**). It also determines the priorities among the selected reference clock sources. The options are:

- **Auto** - This option will automatically choose the highest priority clock source that is currently available. It will automatically select from the *primary*, *secondary*, and *tertiary* sources in order. Once the SMC II software finds an available external source, it will use it until it is no longer available.

Auto is the recommended setting, since it provides clock redundancy.
- **Primary** - This option selects the primary source if available. If it is not available but was running for more than 24 hours, the internal Stratum 3 clock will be used in **Hold Over** mode. If it was running for less than 24 hours, the internal Stratum 3 clock will be used in **Free Run** mode. Whenever the selected clock source becomes available, it will be used.
- **Secondary** - This option selects the secondary source if available. If it is not available but was running for more than 24 hours, the internal Stratum 3 clock will be used in **Hold Over** mode. If it was running for less than 24 hours, the internal Stratum 3 clock will be used in **Free Run** mode. Whenever the selected clock source becomes available, it will be used.
- **Tertiary** - This option selects the tertiary source if available. If it is not available but was running for more than 24 hours, the internal Stratum 3 clock will be used in **Hold Over** mode. If it was running for less than 24 hours, the internal Stratum 3 clock will be used in **Free Run** mode. Whenever the selected clock source becomes available, it will be used.
- **Free Run** - This option selects the internal Stratum 3 clock as the source clock.

Clock Configuration Field Descriptions

Primary: (*option field*) Valid entries are slot and port number, Station Clock A, Station Clock B, or Not Configured.

To use an incoming signal as the primary source for the clock, enter the slot and port number to be used for the timing source. To use an external station clock connected to the rear of the SMC II card, specify **Station Clock A** or **Station Clock B**. To leave the primary source unconfigured, select **Not Configured**.

For the Quad High Speed module, only port 1 may be used as the source clock input. Refer to Table 8-1 for a list of the ports that can be used as a timing source.

Secondary: (*option field*) Choose a slot and port number to utilize line or external (station clock) timing as the secondary clock source, or set to **Not Configured**.

The secondary source can also be set to utilize an external station clock source connected to the rear of the SMC II card (**Station Clock A** or **Station Clock B**) or set to **Not Configured**. The port selection will be shown as **NA** when one of these three options are selected.

Tertiary: (*option field*) Choose a slot and port number to utilize line or external (station clock) timing as the tertiary clock source, or set to **Not Configured**.

The tertiary source can also be set to utilize an external station clock source connected to the rear of the SMC II card (**Station Clock A** or **Station Clock B**) or set to **Not Configured**. The port selection will be shown as **NA** when one of these three options is selected.

Active: Indicates the clock source that is being used by the online SMC II card. The display will indicate **Station Clock A**, **Station Clock B**, or the slot number of the channel card through which the line timing is currently being received.



NOTE:

If N+1 redundancy has caused a redundant card to become active, the slot number of the redundant card will be displayed.

Port: Indicates the port number on the channel card through which the line timing is actively being received, or **NA** if not applicable to the active source.

To the right of the *Port* field, amplifying information is provided for the active source clock. The possible entries here include: **Primary**, **Secondary**, **Tertiary**, or **Free Run**. In the event that an N+1 protected card that is providing clocking becomes unavailable, the backup card will supply clocking and **Primary Protected**, **Secondary Protected**, or **Tertiary Protected** will be shown.

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Overview

Definition

An *alarm* is an error or problem condition located on a device card, the Protection Switch, or the System Manager Controller I or II board.

The DACS II AX provides several alarm indicators:

- The alarm LEDs on the front of the SMC II and the application modules
 - The Alarm column on the Node Summary Menu indicates which device is in alarm and displays the alarm level. Alarm conditions are designated as ***Critical, Major, and/or Minor***.
 - Alarm detail is available from the Node Summary Menu. For details about the cause of the alarm, press **E** to expose alarm detail from the Node Summary Menu.
-

SMC II Alarm Indicators

Overview

Figure 9-1 shows the front and rear boards of the SMC II. The front of the SMC II has alarm LEDs and an Alarm Cut Off (ACO) button. The rear interface of the SMC II has alarm contacts for connecting to an external device for audible or visual alarms.

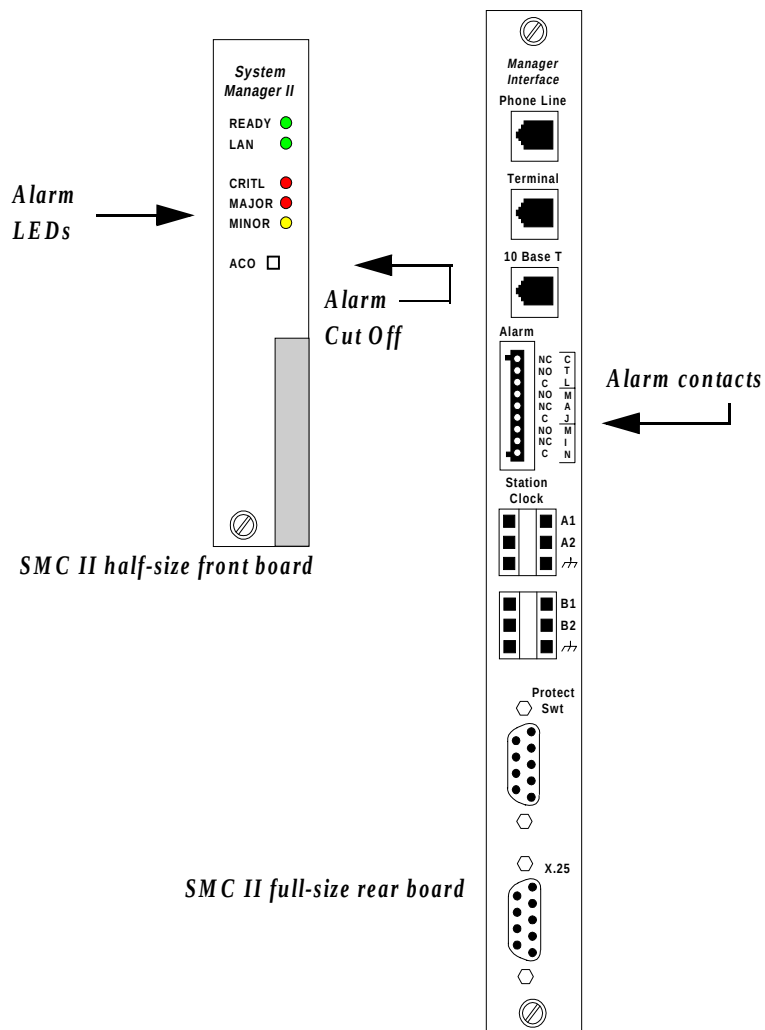


Figure 9-1. SMC II front and rear boards

SMC II Alarm Indicators (Continued)

SMC II Alarm LEDs

The alarm LEDs on the front board of the SMC II are composite alarms of the entire system. The alarm levels are:

- CRITICAL (red) - these alarms have the highest severity state in the system and are generated at the device level. A critical alarm can cause a switchover, if N+1 device redundancy is active.
- MAJOR (red) - these alarms are mostly generated at the port level.
- MINOR (yellow) - this alarm is currently reserved for future enhancements.

The Alarm Status column on the Node Summary Menu (Figure 9-3) correlates with the SMC II Alarm LEDs. For example, when a critical alarm is displayed on the Node Summary Menu, it will also illuminate red on the SMC II front card's Critical Alarm LED.

Alarm Push button

The ACO (Alarm Cut Off) pushbutton on the SMC II front board is used to disable the external alarm contact. The ACO pushbutton clears all alarms until a new alarm occurs. You can enable or disable the alarm contacts from the Node Summary Menu, as shown in the menu displayed in Figure 9-3.

Alarm Contacts

Figure 9-2 shows the alarm contacts located on the SMC II rear interface. There is a terminal plug covering these alarm contacts.

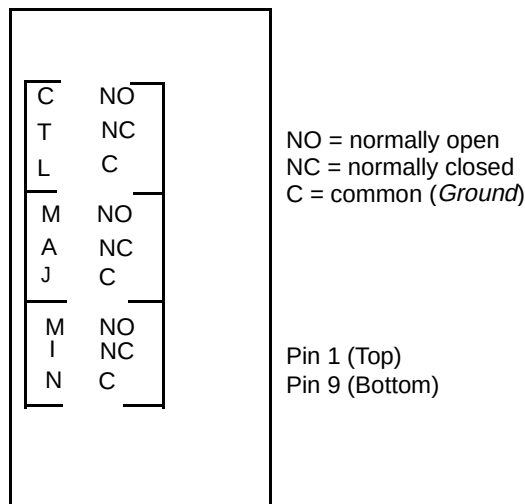


Figure 9-2. Alarm Contacts

SMC II Alarm Modes

The full-size SMC II rear interface is used to provide wiring terminals for a remote alarm panel and an optional Local Alarm unit.

Alarm Interface

A 9-pin detachable header and a re-definable 9-pin D connector are involved in this DACS II AX alarm interface.

The 9-pin detachable header labeled **ALARM** can accommodate pre-stripped solid wire by pressing in and holding the corresponding Orange tab.

The 9-pin female D connector labeled **X.25** can function as an X.25 port or can be redefined as the Local Audible Alarm interface.

Modes

The DACS II AX provides two modes of operation:

- The **Standard** mode is used to provide individual contact activation for each of the three alarm conditions with the X.25 network interface intact.
- The **Local Audio** mode provides relay contact activation for two alarm conditions and relay contact activation for either alarm. The X.25 interface is redefined to interface with an optional Local Audible alarm unit during Critical or Major alarms.

The SMC II software controls the ALARM contacts differently for each mode.

Alarm Connectors

The ALARM connector provides access to mechanical relay contacts. These relay contacts have a current rating of 1 Amp maximum. The user must provide power that matches the site's alarm panel circuit requirements assuring current is limited to less than 1 Amp for each contact.

Configuring the Alarm Mode

To configure for either Standard or Local Audio modes, from the *DACS II AX Main Menu*, select *System Configuration*, then select *Node Profile*. Place the cursor on the **Alarm Contacts Type** line, and toggle to the desired choice. Type **X**, then select **Y** to update the configuration. Exiting this menu will permanently store the selection, until a subsequent selection change is made.

SMC II Alarm Modes (Continued)

Standard Mode

The Standard Mode provides contact closures for Critical, Major, and Minor functions. The front bezel of the SMC II also reflects the Alarm's condition on the LEDs and provides an ACO push button which is used to clear all alarms until a new alarm occurs. In the Standard mode, the X.25 connector is configured for X.25 interface. The Local Alarm unit can not be used.

Table 9-1 and Table 9-2 list the pin assignments for Standard Mode.

Table 9-1. ALARM Connector Pin Assignments and Contact States for Standard Mode

Position	Function	Normal Operation (no alarms)	Alarm Condition
1 (Top)	Critical Alarm: Activated when power is lost or SMC II detects a Critical condition.	Pin 1 to 3 Closed Pin 2 to 3 Open	Pin 1 to 3 Open Pin 2 to 3 Closed
2			
3			
4	Major Alarm: Activated when SMC II detects a Major condition.	Pin 4 to 6 Open Pin 5 to 6 Closed	Pin 4 to 6 Closed Pin 5 to 6 Open
5			
6			
7	Minor Alarm: Activated when SMC II detects a Minor condition.	Pin 7 to 9 Open Pin 8 to 9 Closed	Pin 7 to 9 Closed Pin 8 to 9 Open
8			
9 (Bottom)			

Table 9-2. X.25 Connector Pin Assignments for Standard Mode

Position	Function	Action
1		
2	TX	Transmit RS-232 level Data out to a receiver
3	RX	Receive RS-232 level Data in from Driver
4	DTR	Data Terminal Ready
5	GND	Signal Ground return
6		
7	RTS	Request To Send
8		
9		

SMC II Alarm Modes (Continued)

Local Audio Mode Local Audio Mode provides Critical and Major relay contact activation. The Minor alarm function is not available but instead a combined Critical/Major alarm set of relay contacts are activated.

In Standard Mode, the separate Critical and Major alarms are typically used for a remote visual indicator, while the combined relay of Local Audio Mode is used for a remote audible indicator.

When the Critical/Major alarm condition occurs, it also sounds the Local Alarm unit if installed. The Critical/Major condition is cleared by depressing the front ACO push button, but leaving the individual Critical and/or Major relays and front bezel LEDs active. This condition will remain until SMC II software detects a no alarm condition and clears automatically. The X.25 interface is NOT available in this condition.

Table 9-3 and Table 9-4 list the pin assignments for Local Audio Mode.

Table 9-3. Alarm Connector Pin Assignments and Contact States for Local Audio Mode

Position	Function	Normal Operation (no alarm)	Alarm Condition
1 (Top)	Critical Alarm: Activated when SMC II detects a Critical condition.	Pin 1 to 3 Open Pin 2 to 3 Closed	Pin 1 to 3 Closed Pin 2 to 3 Open
2			
3			
4	Major Alarm: Activated when SMC II detects a Major condition.	Pin 4 to 6 Open Pin 5 to 6 Closed	Pin 4 to 6 Closed Pin 5 to 6 Open
5			
6			
7	Critical or Major Alarm: Activated when SMC II detects a Critical or Major condition.	Pin 7 to 9 Open Pin 8 to 9 Closed	Pin 7 to 9 Closed Pin 8 to 9 Open
8			
9 (Bottom)			

SMC II Alarm Modes (Continued)

Local Audio Mode (Continued)

In Local Audio Mode, the X.25 interface is redefined to interface with an optionally available Local Audible alarm unit.

Table 9-4. X.25 Pin Assignments for Local Audio Mode

Position	Function	Action
1		
2	Audio Output	2KHz signal during Critical / Major alarm condition
3	Not used (RS-232 Receiver)	
4	Not used (Pulled up to 5V through a 1K resistor)	
5	GND	Signal Ground return
6		
7	Not used (Pulled up to 5V through a 1K resistor)	
8		
9		

SMC II Alarm Indicators (Continued)

Toggle Alarm Contacts

The *Toggle Alarm Contacts* command on the Node Summary Menu (Figure 9-3) is useful if you have an external alarm panel that is physically connected to the SMC II rear interface board. If you have an external alarm device connected, you can enable the alarm contacts to invoke an audible or visual (i.e., LED panel) notification if an alarm occurs.

The top left corner indicates the current status of the alarm contacts. To toggle the status to enabled or disabled, press **T**.

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
Standby SMC not present      N+1 Redundancy State: Enabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#  Configured Type  Device State  Alarm
-----
01     + Octal T1/E1    Standby      None
02      Octal T1/E1    Not Present  Critical
03      Octal T1/E1    Not Present  Critical
04      Octal Voice    Not Present  Critical
05      Octal Voice    Not Present  Critical
06     + Octal T1/E1    Online       Critical
07     + Octal T1/E1    Online       None
08     + T3             Online       None
09      T3             Not Present  Critical
10      Octal Voice    Not Present  Critical
11     + T3             Standby      None
SMCA    System Manager A Online       None
SMCB    System Manager B Not Present  Critical
PSX     ProtectionSwitch Online       Cr,Mj

[C]lear error counts  [S]lot Cfg      [E]xpose   [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver [R]estore

```

Figure 9-3. Node Summary Menu - Alarm Contact is Enabled

Displaying Alarm Detail

The Alarm column displayed on this screen indicates an error or problem(s) with the device or port. Alarm conditions are designated as **Critical**, **Major**, and/or **Minor**. For details about the cause of the alarm, press **E** to expose alarm detail.

In the *Node Summary Menu*, the (*) asterisk is a flag for error conditions such as, Bipolar Violations, CRCs, BERT errors, etc. As long as there are no errors occurring, the (*) can be cleared by pressing "**C**".

Exposing an alarm displays information about a problem or error condition of the device, Protection Switch, or SMC II. As shown in the Node Summary Menu, Figure 9-3, several Critical alarms have occurred due to a device missing from its configured slot. To obtain more information about this error alarm, you can expose it.

Alarm on Application Module

To expose an alarm on a device card:

1. From the Main Menu, position your cursor on the *Node Summary* field and press **<Enter>**.

- Then position your cursor on the device card slot showing a *Critical* or *Major* alarm in the Alarm Status column and press **E**. A screen similar to the one shown in Figure 9-4 appears:

Lucent Technologies
DACS II AX 11 - System Manager
Help = [?]

Slot Information
Slot Nbr: 06 Configured Type: Octal T1/E1 Version: 1

Device.....: Online
Clock Source.....: No
In Test.....: No
Error Indicator...: No

----Critical Alarms-----
Rear Card.....: Missing
Frame Sync.....: Ok
System Clock.....: Ok
PSX Interface Card....: Ok
PSX Interface Cable...: Missing

Port Alarm Information
01=None 02=None 03=None 04=None 05=None 06=None
07=None 08=None

Figure 9-4. An Exposed Alarm on A Device Card

As shown in Figure 9-4, when a device is missing from a slot, then a *Critical* alarm is displayed in the Alarm Status column. In this case, the rear interface card is missing. In addition, the N+1 Protection Switch cable is missing. There are no alarms on the port, as shown in the port alarm information at the bottom of the screen shown in Figure 9-4.

If you refer back to the screen in Figure 9-3, you will note that the Protection Switch slot simultaneously shows *Critical* and *Major* alarms, displayed as *Cr*, *Mj*.

Alarm on N+1 Protection Switch

To expose an alarm on the N+1 Protection Switch:

- From the Main Menu, position your cursor on the *Node Summary* field and press **<Enter>**.

2. Then position your cursor on the PSX slot showing a *Critical* and/or *Major* alarm in the Alarm Status column and press **E**. A screen similar to the one shown in Figure 9-5 appears:

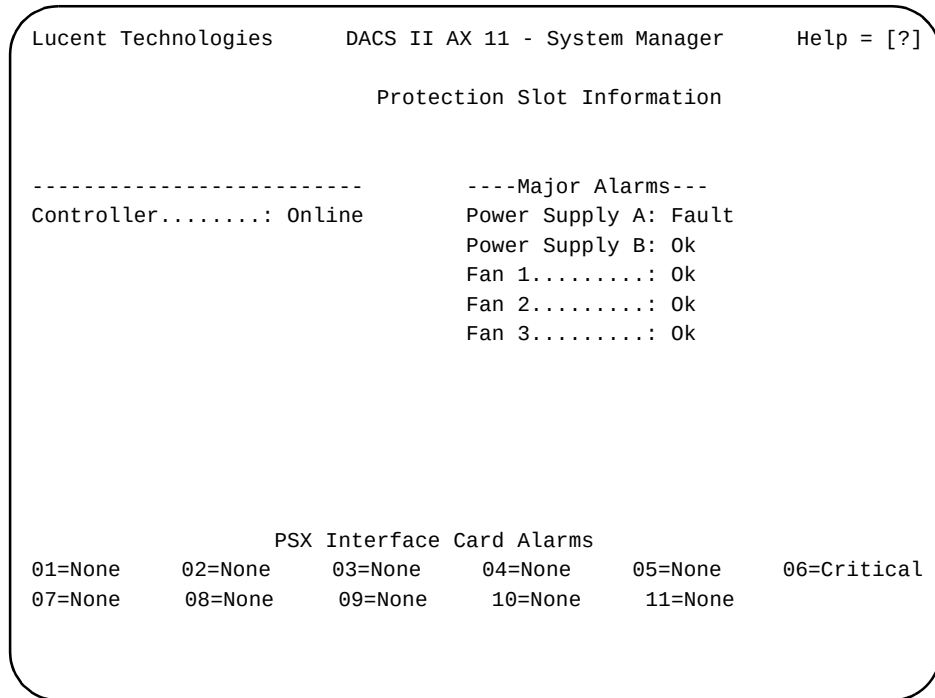


Figure 9-5. An Exposed Alarm on the Protection Switch

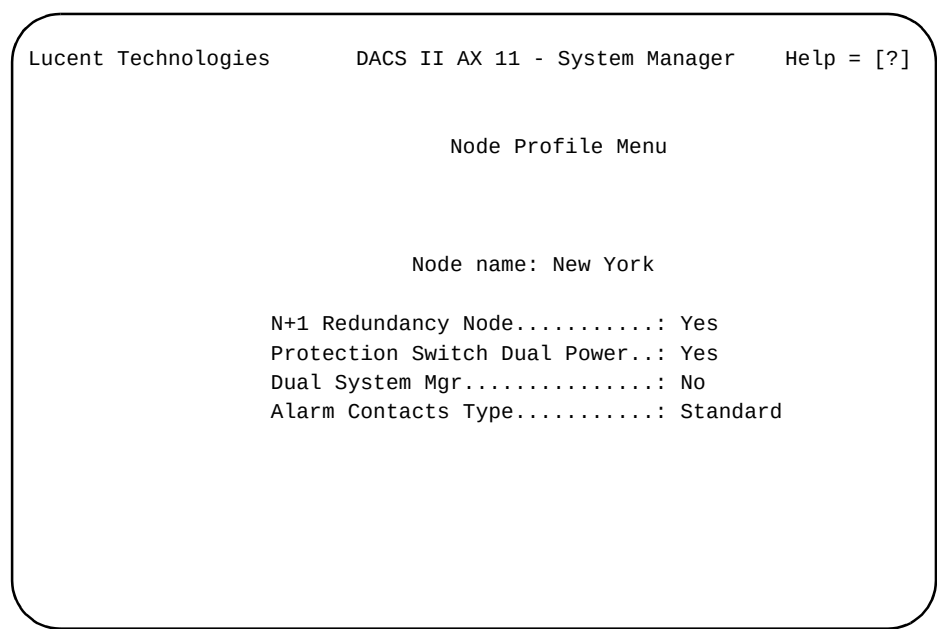
As you can see from the screen in Figure 9-5, the Protection Switch Controller board is online; a *Major* alarm is generated in the absence of a second Power Supply; and a *Critical* alarm is shown at the bottom portion of the screen, displaying a problem with the rear interface card in slot 6. In this case, the rear interface card was intentionally pulled out of its slot to generate and show a *Critical* alarm.

Critical Alarm - Check Node Profile

The Node Profile should accurately reflect the DACS II AX configuration. If the information on the Node Profile Menu (Figure 9-3) is inaccurate, a Critical alarm will be generated.

If you *do not* have dual SMC II boards, an N+1 Protection Switch, or dual power supplies in your N+1 Protection Switch, you will need to specify this in the *Node Profile Menu*. Also, if you are using an external alarm device, indicate the type in the Alarm Contacts Type field.

See Chapter 4 for more detail on the Node Profile.



The screenshot shows a terminal window titled "Lucent Technologies DACS II AX 11 - System Manager Help = [?]". The main content is the "Node Profile Menu". It displays the "Node name: New York" and a list of configuration options with their current values:

Configuration Option	Value
N+1 Redundancy Node	Yes
Protection Switch Dual Power	Yes
Dual System Mgr	No
Alarm Contacts Type	Standard

Figure 9-6. Node Profile Menu

Critical Alarm on SMC

If a *Critical* alarm appears in one of the SMC slots, follow the next procedure to expose the problem.

Expose Critical Alarm on SMC

1. From the Main Menu, position your cursor on the *Node Summary* field and press **<Enter>**.
2. Then position your cursor on the *SMCA* or *SMCB* slot showing a *Critical* and/or *Major* alarm in the Alarm Status column and press **E**.

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
                        SMC Information  
      Slot Nbr: SMCB Configured Type: System Manager B      Version: 1  
  
-----  
Device.....: Not Present      ----Major Alarms-----
```

Figure 9-7. An exposed alarm on the SMCB

As shown in Figure 9-7, the redundant SMC device is not present and triggered a *Critical* alarm.

Alarm Levels

The following tables describe conditions and the type of notification that these conditions generate: critical alarm, major alarm, minor alarm, or SNMP trap.

Table 9-5. Slot Alarm Level

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
<i>Device type mismatch</i> - The slot does not contain the device type for which it was configured.	X			X
<i>Device missing</i> - The slot, while configured to hold a device, does not contain a device.	X			X

Table 9-6. Device Alarm Level

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
In online state				X
In standby state				X
Frame sync not present	X			X
System clock not present	X			X
SMCs database not in sync		X		X
Clock free run error	X			X
In offline state	X			X
In defective state	X			X
In bus error state	X			X
Configuration error		X		X
No rear card	X			X
Out of service				X

Alarm Levels (Continued)**Table 9-7. T1/E1 Port Alarms**

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Receiving far end loss of frame (receiving yellow alarm)		X		X
Near end sending loss of frame (transmitting yellow alarm)		X		X
Far end sending alarm indication signal		X		X
Near end sending alarm indication signal		X		X
Near end loss of frame (red alarm)		X		X
Near end loss of signal		X		X
E1 TS16 alarm indication signal		X		X
Far end sending TS16 LOMF		X		X
Near end sending TS16 LOMF		X		X
Other line status		X		X
Near end in unavailable signal state		X		X
DS2 payload alarm indication signal		X		X
DS2 performance threshold exceeded		X		X
Near end transmit Slip		X		X
Near end receive Slip		X		X
Near end severe errored frame		X		X
Change in frame alignment		X		X
Configuration error		X		X
Out of service				X

Alarm Levels (Continued)**Table 9-8. T3 Port Alarms**

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Receiving far end loss of frame (receiving yellow alarm)		X		X
Near end sending loss of frame (transmitting yellow alarm)		X		X
Far end sending alarm indication signal		X		X
Near end sending alarm indication signal		X		X
Near end loss of frame		X		X
Near end loss of signal		X		X
Other line status		X		X
Near end in unavailable signal state		X		X
Near end severed errored frame		X		X
Clock failure		X		X
Far end block error		X		X
PBIT or CBIT parity error		X		X
MBITS in error		X		X
LIU digital loss of signal.		X		X
LIU analog loss of signal		X		X
LIU excessive zeros		X		X
LIU line coding violation		X		X
LIU PRBS error		X		X
Configuration error		X		X
Out of service				X

Alarm Levels (Continued)

Table 9-9. High Speed Port Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Receive FIFO error		X		X
Transmit FIFO error		X		X
Clock edge error		X		X
Configuration error		X		X
Out of service				X

Table 9-10. OCU Port Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Near end loss of signal		X		X
Other line status		X		X
Near end severe errored frame		X		X
Configuration error		X		X
Out of service				X

Table 9-11. Test Access Module Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Configuration error		X		X
Out of service				X

Alarm Levels (Continued)

Table 9-12. Octal Voice Port Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Configuration error		X		X
Out of service				X

Table 9-13. Router Port Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Configuration error		X		X
Out of service				X

Alarm Levels (Continued)**Table 9-14. STS-1 Port Alarms**

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Receiving far end loss of frame (receiving yellow alarm)		X		X
Near end sending loss of frame (transmitting yellow alarm)		X		X
Far end sending alarm indication signal		X		X
Near end sending alarm indication signal		X		X
Near end loss of frame (red alarm)		X		X
Near end loss of pointer		X		X
Near end out of frame		X		X
Near end sending alarm indication signal		X		X
Near end detected test code				
Other line status		X		X
Near loss of signal		X		X
Carrier equipment out of service				X
Clock failure		X		X
Loss of multiframe indication		X		X
Error in received path trace		X		X
LIU digital loss of signal		X		X
LIU analog loss of signal		X		X
LIU excessive zeroes		X		X
LIU line coding violation		X		X
LIU PRBS error		X		X
Configuration error		X		X
Out of service				X

Alarm Levels (Continued)

Table 9-15. Hybrid DS-3 Port Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Far end sending alarm indication signal		X		X
Near end sending alarm indication signal		X		X
Near end out of frame		X		X
Near end loss of signal		X		X
Near end red error		X		X
Far end received failure error		X		X
Near end line code violation error		X		X
Near end framing error		X		X
Near end excessive zeroes		X		X
Far end block error		X		X
PBIT or CBIT parity error		X		X
LIU excessive zeroes		X		X
LIU analog loss of signal		X		X
LIU line coding violation		X		X
LIU PRBS error		X		X
Configuration error		X		X
Out of service				X

Table 9-16. Power Supply Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Power supply not present		X		X
Power supply not ok		X		X

Alarm Levels (Continued)

Table 9-17. Protection Switch Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Power supply A not ok		X		X
Power supply B not ok		X		X
Fan 1 not ok		X		X
Fan 2 not ok		X		X
Fan 3 not ok		X		X

Table 9-18. Protection Switch Line Card Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Line card switched to spare		X		X
Line card cable missing	X			X
Line card missing	X			X
Line card type mismatch	X			X
Line card relay malfunction	X			X

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Background

Purpose

The purpose of this chapter is to describe how the N+1 Protection Switch works and how to operate and maintain the N+1 Protection Switch.

Objectives

This section is designed to enable you to:

- Describe the major parts of the N+1 Protection Switch.
 - Set up a redundancy group for Octal T1/E1 modules
 - Set up a redundancy group for broadband modules (DS-3, hybrid DS-3, or STS-1)
 - Set the options for the N+1 Protection Switch
 - Clean or change the air filter in the N+1 Protection Switch.
 - Change the fan assembly
 - Switchover to a standby device manually or automatically
 - List the error conditions that will cause an automatic switchover to the standby device
 - Restore a primary device
-

Related Information

Refer to Chapter 2, *Installation* for the following procedures:

- Installing the N+1 Protection Switch
- Connecting the N+1 Protection Switch Controller Card
- Verifying N+1 Protection Switch Installation

Refer to Chapter 3, *Node Summary* for the following procedures:

- Upgrading from SMC I to SMC II - DACS II AX 11
 - Upgrading from SMC I to SMC II - DACS II AX 4
-

Terms Used

Broadband Primary Card - this card resides in the N+1 Protection Switch and is used to back up a Broadband Application Module in slot 8, 9 or 10.

Broadband Redundant Card - this card resides in the N+1 Protection Switch and is used to back up Broadband Application Modules ; it must reside in slot 11.

Controller Card - provides communications between the DACS II AX's System Manager and the N+1 Protection Switch.

Narrowband Primary Card - this card resides in the N+1 Protection Switch and is used to back up an Octal T1/E1 Application Module in slots 2 through 11.

Narrowband Redundant Card - this card resides in the N+1 Protection Switch and is used to back up an Octal T1/E1 Application Module; it must reside in slot 1.

Primary Device - a device in an redundancy group that would normally carry traffic.

Primary Slots (DACS II AX) - cards plugged into these slots are considered active and online under normal operation.

Primary Slots (N+1 Protection Switch) - holds Interface Cards for the cards plugged into the DACS II AX's primary slots.

Protected Device - this is a primary device that will be replaced by a redundant device should it fail within its redundancy group.

PSX - N+1 Protection Switch

Redundant Device - one device in an redundancy group that has been configured to replace or substitute for a failed primary device in the redundancy group.

Redundancy Group - a collection of configured primary devices and a redundant device that will be used for redundancy.

Restore - an action that occurs when traffic is returned to the primary device that was being protected in the redundancy group by a redundant device.

Standby Slots (DACS II AX) - cards plugged into these slots are considered inactive and offline under normal operation. They become active and go online when a card plugged into the primary slot becomes non-operational.

Standby Slots (N+1 Protection Switch) - holds Interface Cards for the cards plugged into the DACS II AX's standby slots.

Switchover - an action that occurs when a redundant device replaces a primary device that failed.

Overview

Purpose

The N+1 Protection Switch is designed to provide backup for the T1, E1, T3, hybrid DS-3 and STS-1 ports that are on the Octal T1/E1, DS-3, hybrid DS-3 and STS-1 devices in the DACS II AX. If one of these devices becomes non-operational, a redundant device of the same type of module can be switched in. With the redundant system in place, the non-operational card can automatically switch to its back up device to bring the system up with minimal down time and without user intervention.

Physical Description

The N+1 Protection Switch is a separate unit from the DACS II AX. As shown in Figure 10-1, the N+1 Protection Switch rests on top of the DACS II AX 11 chassis. The DACS II AX 4 cannot be equipped with the N+1 Protection Switch.



Figure 10-1. N+1 Protection Switch and DACS II AX 11

Overview (Continued)

Physical Description (Continued)

The N+1 Protection Switch contains:

- Eleven slots for **Interface Cards** - these cards provide the functionality to switch to the DACS II AX's primary or redundant slot. They are physically connected via primary or standby adapter cables to the DACS II AX. The N+1 Protection Switch network connections come into this card through the *Primary Adapter Cable*.
- One slot for the fail safe **Controller Card** - provides communications between the DACS II AX's System Manager Controller II and the N+1 Protection Switch.
- Two slots for the **DC Redundant Power Supply**. The DC Power Supply has a range of from 18VDC to 56VDC. Terminal blocks are used for DC. A green LED indicates that the power supply is working.
- A fan assembly unit for auxiliary cooling.

Requirements

To use the N+1 Protection Switch, the DACS II AX 11 must be equipped with:

- Release 9.01 or higher
- SMC II
- Modules to be protected: Octal T1/E1, T3, hybrid DS-3, or STS-1 modules



NOTE:

The SMC I can not be connected to the N+1 Protection Switch Controller Card.

Overview (Continued)

Connectors

The N+1 Protection Switch Controller Card and DACS II AX 11 SMC II rear interface are connected by a DB9 Serial Interface Cable. Cards plugged into the N+1 Protection Switch's primary slots and the DACS II AX 11's primary slots are connected via *Primary Adapter Cables*.



Figure 10-2. N+1 Protection Switch and DACS II AX 11 (rear view)

Overview (Continued)

Types of Redundancy

The N+1 Protection Switch can be equipped for either narrowband or broadband redundancy or both.

- **Narrowband Redundancy** - **1:N** where **N** is ≤ 10 . There is one standby Octal T1/E1 application module in Slot 1 of the DACS II AX for the group of protected Octal T1/E1 modules, which can be in slots 2 through 11 in the DACS II AX.
- **Broadband Redundancy** - **1:N** where **N** is ≤ 3 . There are three types of modules for broadband redundancy: T3, hybrid DS-3, and STS-1.
 - **T3**: The standby T3 application module is in Slot 11 of the DACS II AX for the group of protected T3 modules, which can be in slots 8 through 10 in the DACS II AX.
 - **Hybrid DS-3**: The standby hybrid DS-3 application module is in Slot 11 of the DACS II AX for the group of protected hybrid DS-3 modules, which can be in slots 8 through 10 in the DACS II AX.
 - **STS-1**: The standby STS-1 application module is in Slot 11 of the DACS II AX for the group of protected STS-1 modules, which can be in slots 8 through 10 in the DACS II AX.

Restrictions on Broadband Redundancy

The DACS II AX can protect one type of broadband module, not a mixed group of broadband modules. The DACS II AX 11 can accommodate T3, hybrid DS-3 and STS-1 modules in the same chassis, but only one type can be protected.

Switchover Criteria

The Protection Switch can detect a hardware failure and automatically switch in a standby module. The following conditions can cause a switchover:

- Front or rear card is not present
 - Channel card encounters system fatal errors
 - Channel card not receiving message from the SMC
 - Mismatch between hardware and software shadow
 - Missing cables
 - Card problems such as loss of communication with SMC, loss of clock, framer problems.
-

Overview (Continued)

Slot Assignments for Redundancy

When the DACS II AX is equipped with the N+1 Protection Switch, the DACS II AX can be configured for narrowband or broadband redundancy, or both. Locate standby and primary devices in the slots indicated in the following table.

Type of Redundancy	Slot for Standby Module	Slots Available for Primary Modules	Maximum Number of Protected Modules
Narrowband (T1/E1) ONLY	1	2 - 11	10
Broadband ONLY	11	8 - 10	3
BOTH			
Narrowband (T1/E1)	1	2 - 7	6
Broadband	11	8 - 10	3

Sample Layout

N+1 Protection Switch (Redundancy Chassis)												
DC Power Supply	Broadband			-- Empty --				Narrowband				Controller Card
	RD	PD	PD					PD	empty	PD	RD	
	T3 SAC	T3 PAC	T3 PAC					Octal T1/E1 PAC		Octal T1/E1 PAC	Octal T1/E1 SAC	DB9 M-to-M Serial Interface Cable
	DACS II AX Equipment Chassis - Slots											
	11	10	9	8	7	6	5	4	3	2	1	
Power Supply	T3	T3	T3	Octal High Speed Data	STS-1	Router	Test Access	Octal T1/E1	empty	Octal T1/E1	Octal T1/E1	SMC II rear interface

Figure 10-3. Sample Configuration of DACS II AX with Protection Switch (Rear View)

Sample Configuration (Continued)

Parts of the N+1 Protection Switch

The following table list the parts of the Protection Switch shown in Figure 10-3.

N+1 Protection Switch Part	Description
DC Power Supply	The protection switch can be equipped with one or two DC power supplies.
Broadband - RD	Redundant Device for T3. The Redundant Device is connected to the standby T3 card in Slot 11 of the DACS II AX.
Broadband - PD	Primary Device. A Primary Device is connected to each of the T3 modules in the DACS II AX that are active and online under normal operation.
Narrowband - PD	Primary Device. A Primary Device is connected to each of the Octal T1/E1 modules in the DACS II AX that are active and online under normal operation.
Narrowband - RD	Redundant Device for Octal T1/E1. The Redundant Device is connected to the standby Octal T1/E1 card in Slot 1 of the DACS II AX.
Controller Card	Provides communication between DACS II AX's System Manager and the protection switch.

Sample Configuration (Continued)

Cables from N+1 Protection Switch to DACS II AX

The following table list the cables that connect the DACS II AX with the Protection Switch shown in Figure 10-3.

Cable	Description
T3 SAC	The T3 Secondary Adapter Cable connects the redundant device in the Protection Switch to the application module in Slot 11.
T3 PAC	The T3 Primary Adapter Cable connects the primary device in the Protection Switch to the T3 modules which can be in slots 8 through 10.
Octal T1/E1 PAC	The Octal T1/E1 Primary Adapter Cable connects the primary device in the Protection Switch to the Octal T1/E1 modules which can be in slots 2 through 11.
Octal T1/E1 SAC	The Octal T1/E1 Secondary Adapter Cable connects the redundant device in the Protection Switch to the application module in Slot 1.
DB9 M-to-M Serial Interface Cable	The DB9M-DB9M Straight-Through Cable is a 1.5 foot DB-9 male to DB-9 male cable assembly used in conjunction with the N+1 Controller module for connection to the DACS II AX 11.

Network connections come in to the N+1 Protection Switch.

Sample Configuration (Continued)

Parts of the DACS II AX

The following tables list the parts of the DACS II AX with Protection Switch shown in Figure 10-3.

DACS II AX Part	Description
Power Supply	The DACS II AX can be equipped with AC or DC power supplies. When equipped for power redundancy, the DACS II AX 11 has either two AC supplies or two DC supplies.
Octal T1/E1 module in slot 1	The standby module that can be manually or automatically switched in to take over for a failed Octal T1/E1 module that is part of the Octal T1/E1 redundancy group.
Octal T1/E1 modules in slots 2 and 4	The Octal T1/E1 modules in the DACS II AX that are active and online under normal operation. To be protected, these modules must be part of the Octal T1/E1 redundancy group. These modules can be in any slot 2-11. If there is also a T3 redundancy group, use only slots 2-7 for Octal T1/E1 modules.
Octal High Speed Data, Test Access, Router, STS-1 Modules	The DACS II AX can contain any of the application modules. These modules are not part of a protection group.
T3 modules in slots 9 and 10	The T3 modules in the DACS II AX that are active and online under normal operation. To be protected, these modules must be part of the T3 redundancy group and be located in any slot 8-10.
T3 module in slot 11	The standby module that can be manually or automatically switched in to take over for a failed T3 module that is part of the T3 redundancy group.
SMC II Rear Interface	Connected to the Protection Switch's Controller Card via a DB9 Serial Interface Cable.

Enable Redundancy for Modules

Description Enable redundancy for each module that is to be included in a redundancy group.

For redundancy, enable redundancy for:

- Each module to be protected
- The redundant module
 - The redundant narrowband module (Octal T1/E1) should be in Slot 1 of the DACS II AX. If the device is not in Slot 1 or if it does not have Redundancy enabled, then switchover can not occur
 - The redundant broadband module should be in Slot 11 of the DACS II AX. If the device is not in Slot 11 or if it does not have Redundancy enabled, then switchover can not occur.

The types of broadband modules that can be protected are: T3, hybrid DS-3, and STS-1. Only one type of broadband module can be protected.

Procedure

To enable redundancy for a module:

1. Access the Slot Configuration Menu from either the DACS II AX Main Menu or from the Node Summary Menu.

The Slot Configuration Menu displays (Figure 10-4).

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1		Enable
2	Octal Voice		Disable
3	Octal Voice		Disable
4	Octal Voice		Disable
5	Octal Voice		Disable
6	Octal Voice		Disable
7	Octal T1/E1	New York	Disable
8	T3	San Francis	Enable
9	QUAD OCU		Disable
10	QUAD OCU		Disable
11	T3		Enable

N+1 Redundancy: Enable
N+1 Redundancy Switchover: Automatic
N+1 Redundancy Restore: Manual

Change Card = [Enter key] [D]elete Card

Figure 10-4. Slot Configuration Menu

2. Move the cursor to a module to be included in a redundancy group and press **<Enter>**. The following menu appears:

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
Slot Configuration  
  
Slot name:  New York  
Card type:  Octal T1/E1  
Redundancy: Enable
```

Figure 10-5. Slot Configuration Screen

3. Type in a Slot name.
4. Select Octal T1/E1, DS-3, HT3, or STS-1 for Card type.
5. Select Enable for Redundancy.
6. To save changes, press **X**.
7. When prompted: "Update Configuration? Are you sure? (Y/N)" press **Y**.
8. Press **X** to return to the Slot Configuration Menu.
9. Repeat steps 2 through 9 for each module to be included in a redundancy group.

Set the Protection Switch Redundancy Options

Description

There are three options which need to be set for the Protection Switch. These three options are on the Slot Configuration menu.

- N+1 Redundancy State
 - N+1 Redundancy Switchover Mode
 - N+1 Redundancy Restore
-

Procedure

To select options for the protection switch, complete the following:

1. Access the Slot Configuration Menu. The Slot Configuration Menu can be accessed either of the following ways:
 - From the DACS II AX Main Menu, select System Configuration, then select Slot Configuration.
 - From the DACS II AX Main Menu, select Node Summary, move the cursor to a slot, then press **S**.

The Slot Configuration Menu displays (Figure 10-4).

Lucent Technologies
DACS II AX 11 - System Manager
Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1		Enable
2	Octal Voice		Disable
3	Octal Voice		Disable
4	Octal Voice		Disable
5	Octal Voice		Disable
6	Octal Voice		Disable
7	Octal T1/E1	New York	Enable
8	T3	San Francis	Enable
9	QUAD OCU		Disable
10	QUAD OCU		Disable
11	T3		Enable

N+1 Redundancy: Enable
 N+1 Redundancy Switchover: Automatic
 N+1 Redundancy Restore: Manual

Change Card = [Enter key]
[D]elete Card

Figure 10-6. Slot Configuration Menu

2. Move the cursor to N+1 Redundancy and select one of the following:
 - **Enable** - Choose this option to enable the N+1 Protection Switch.
 - **Disable** - The cards in a redundancy group are no longer actively protected; thus a switchover *can not* occur.
 - **Freeze** - Does not permit the N+1 Redundancy logic from updating the system; thus, the last result of the N+1 Redundancy is displayed.

When you select a setting for **N+1 Redundancy** on the *Slot Configuration Menu* (Figure 10-6), it corresponds with the **Device State** for the PSX on the *Node Summary Menu* (Figure 10-7). If the **N+1 Redundancy** is *Enabled* on the *Slot Configuration Menu*, and the **Device State** for the PSX is *Frozen* on the *Node Summary Menu*, a N+1 Protection Switch cable may be missing.

3. Verify that the redundant modules are ready by observing the green blinking Ready LED. Verify that each online module has a steady green Ready LED.

4. For N+1 Redundancy Switchover, select one of the following modes:
 - **Narrowband Automatic** - This setting enables a switchover to automatically occur on just the T1/E1 devices in a T1/E1 redundancy group.
 - **Broadband Automatic** - This setting enables a switchover to automatically occur on the protected broadband modules only.
 - **Automatic** - This setting enables a switchover to automatically occur on both the narrowband and broadband redundancy groups.
 - **Manual** - A switchover will not occur until the operator does so manually. Not recommended.

The changes made to the N+1 Redundancy State are recorded dynamically. It *will not* be necessary to save changes; however, you must exit the screen in order for the changes to take effect.

5. For N+1 Redundancy Restore, the only option is **Manual**. When an off-line primary device is in standby mode, the *Restore* command forces the selected device to go on-line.
 6. Type **X** to exit this menu. You must exit the screen in order for changes to take effect.
-

Verifying Device Status

Description After completing the procedures, verify the status that appears on the Node Summary Menu for each of the devices in the DACS II AX.

Procedure To verify the status of the devices in the DACS II AX, complete the following:

1. From the DACS II AX Main Menu, select Node Summary. The Node Summary Menu displays (Figure 10-7).

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
Databases:  Insync          N+1 Redundancy State:  Frozen
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#  Configured Type      Device State  Alarm
-----
01      + Octal T1/E1        Online        None
02      Octal Voice          Not Present   None
03      Octal Voice          Not Present   None
04      Octal Voice          Not Present   None
05      Octal Voice          Not Present   None
06      Octal Voice          Not Present   None
07      - Octal T1/E1        Standby       None
08      + T3                 Online        *None
09      Quad OCU             Not Present   None
10      Quad OCU             Not Present   None
11      + T3                 Standby       None
SMCA    System Manager A    Online        None
SMCB    System Manager B    Standby       None
PSX     ProtectionSwitch    Online        None

[C]lear error counts  [S]lot Cfg      [E]xpose      [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver  [R]estore

```

Figure 10-7. Node Summary Menu

2. Check the setting for the N+1 Redundancy State listed near the top of the screen. If this setting is incorrect, return to the Slot Configuration Menu and change it.

3. Check for plus (+) or minus (-) signs next to each application module that is protected.

(+) The plus sign indicates that the **Configured Type** is correct, the slot redundancy in the Slot Configuration Menu is *enabled*, the redundancy group has a configured and *enabled* redundant device, and the N+1 Protection Switch is *Online*.

The (-) indicates a protected card has switched over to the redundant device.

On the Node Summary screen in Figure 10-7, The **Device State** column for the redundant device in Slot 1 is *Online* and actively protecting a failed device in Slot 7 of the Octal T1/E1 redundancy group. The T1/E1 primary device in Slot 7 is in *Standby* mode (i.e., waiting to be *Restored*). A **Restore** can only be performed *manually* by the operator.

4. Look for alarm indications in the Alarms column. To display details about an alarm, press **E**. For details on alarms, see Chapter 9. Most critical alarms will cause a switchover to occur.
-

Displaying Detailed Redundancy Status Information per Slot

Description Detailed redundancy status information can be displayed for any module in a redundancy group.

Procedure To display redundancy status information for an Octal T1/E1 module or T3 module in a protection group:

1. From the Node Summary Menu, select a module that is in the protection group and press **<Enter>**. The module's Main Menu displays (Figure 10-8):

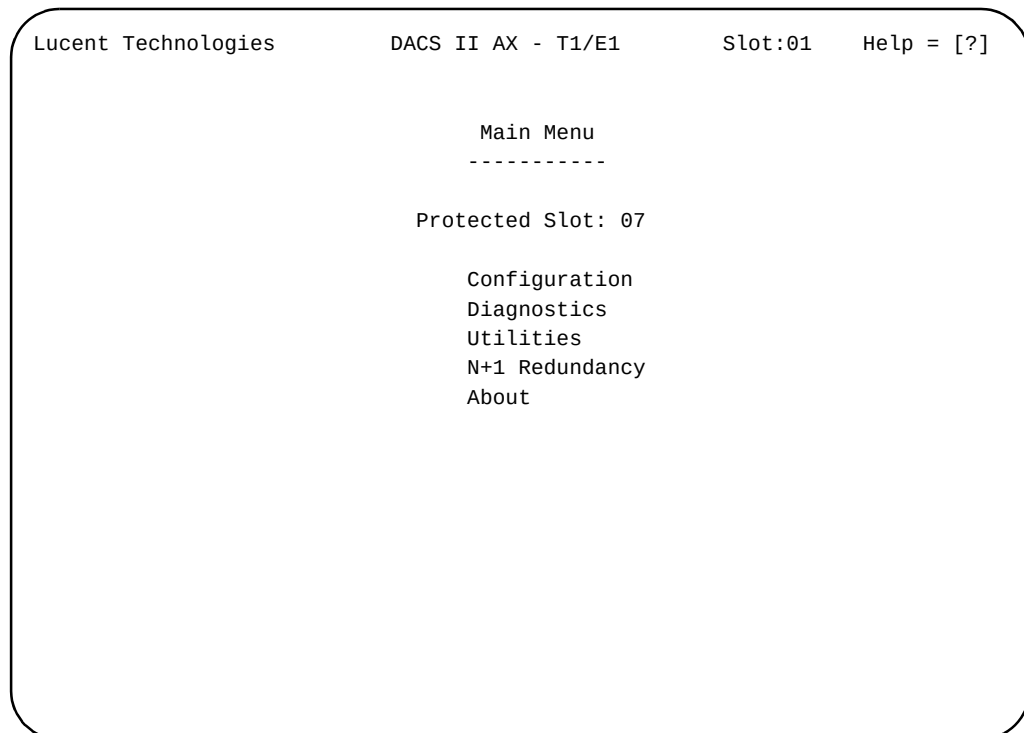


Figure 10-8. Octal T1/E1 Main Menu

The Main Menu shows the following:

- **Protected Slot:** This field appears only for a redundant device. For Octal T1/E1, the redundant device is in Slot 1. For broadband modules, the redundant device is in Slot 11. This field does not appear for any of the primary modules in any of the other slots.

If a switchover has occurred, the Protected Slot field lists the device that is being protected. In Figure 10-9, the redundant device in Slot 01 has taken over and is protecting the Octal T1/E1 primary device in Slot 07. If a switchover had not occurred, the Protected Slot field would read *none*.

- **Menu Options:** The *Configuration*, *Diagnostics*, *Utilities*, and the *About* submenus and their functionality are described in Chapter 11, DS3 Module, and in Chapter 17, Octal T1/E1 Module.



NOTE:

Do not change the configuration information for the redundant narrowband device in Slot 01 or the redundant broadband device in Slot 11.

2. To view N+1 Device Redundancy details for the slot, from the module's Main Menu, select N+1 Redundancy. The N+1 Redundancy Menu displays (Figure 10-9). Note that the Protected Slot field is displayed only for the Octal T1/E1 redundant device in Slot 01 and the T3 redundant device in Slot 11.

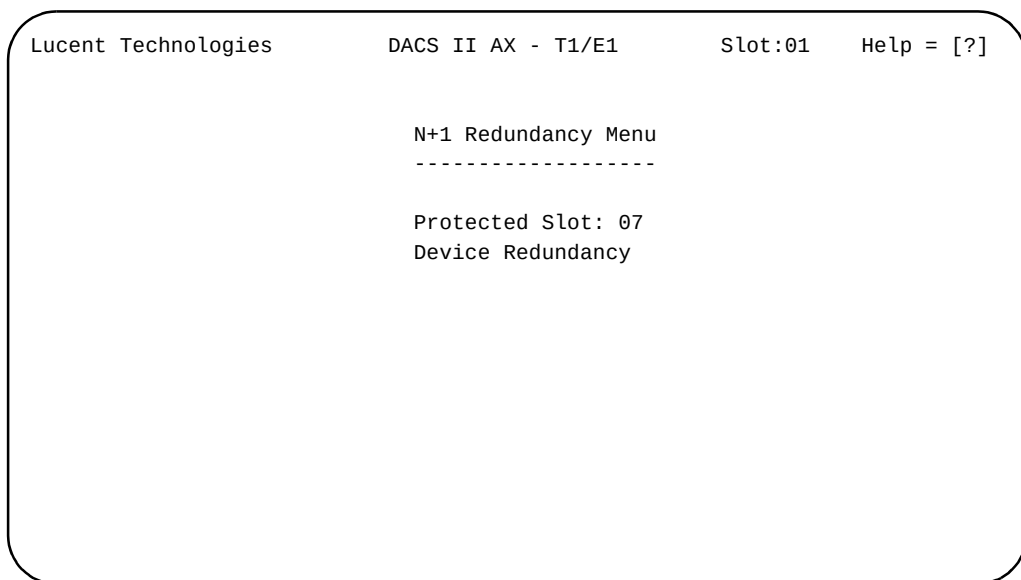


Figure 10-9. N+1 Device Redundancy Status Screen

3. Select *Device Redundancy*. The N+1 Redundancy Status Menu displays (Figure 10-10). Refer to the field descriptions in the following section.

Lucent Technologies DACS II AX - T1/E1 Slot:01 Help = [?]

N+1 Redundancy Status Menu

Redundancy...: Enabled
Card Type...: Secondary
Device State: Online

	State	Change Count
Frame Sync Pulse.....	OK	0
System Clock.....	OK	0
Backplane Timeslot Management:	OK	0
Communication with System Mgr:	OK	0
Rear Card.....	OK	-
Framers.....	OK	0

[C]lear counters

Figure 10-10. N+1 Redundancy Status Menu

4. To exit this screen and return to the module's main menu, type **X**.

**N +1 Redundancy
Status Menu Field
Descriptions**

Redundancy: Enabled or Disabled. This option is set from the Slot Configuration Menu.

Card Type: Primary or Secondary. A primary card is a protected module in a redundancy group that would normally carry traffic. A secondary card is the standby card that is available should a primary card fail. The secondary card for Octal T1/E1 is always in Slot 1. For broadband redundancy is also used, the secondary card is in Slot 11.

Device State: Online or Offline. Online means the card is passing traffic. In Figure 10-10, the secondary card is *Online*. The secondary card is passing traffic for the primary card in Protected Slot 07 (Figure 10-9). All events generated are reported under the slot number of the redundant device.

Switchover

Definition

A switchover is an action that occurs when a redundant device replaces a primary device. The primary device's configuration is copied to the redundant device and the redundant device takes over for the primary device. The primary device goes *Offline* and the redundant device goes *Online*.

While the redundant device is in use, no other primary device failures in that protection group can be switched.

**NOTE:**

If a switchover has occurred, do not remove the failed primary device from the protection group.

Types of Switchover

A switchover can be done manually or automatically.

Manual Switchover

If the operator wants to take a primary card off-line for maintenance purposes, a switchover can be executed manually.

To switchover a card manually:

1. Switch over a protected module. From the *Node Summary Menu*, place the cursor on the primary device slot to be switched, and press **O**.
-

Switchover

Automatic Switchover

The protection switch can be set to switch automatically from a failed primary device to the secondary device in a protection group. When a failed primary card is detected, it will lose traffic for a short time before the secondary card takes over.

Conditions for Automatic Switchover

An automatic switchover occurs when a primary device in an redundancy group has failed and one or more of the following error conditions exist:

- **Frame Sync pulse: Missing (bus error)** - A frame sync pulse error occurs when there is a problem from the SMC by sending a wrong pulse or the device is not receiving the pulse correctly.
 - **System Clock: Missing (bus error)** - The system clock is lost (currently not available for the T3).
 - **Backplane Timeslot Management: Invalid (bus error)** - The backplane is inundated with too many timeslots.
 - **Communication with System Manager: Lost (bus error)** - The device has not received any messages from the SMC and the device responds that it is not present.
 - **Rear Card: Missing (bus error)** - Rear card is not detected. The device will reset once the rear card has been detected.
 - **Framer: Bad (general error)** - A framer is bad. There is a mismatch between the current value read from the hardware and the values recorded by the software.
-

Switchover (Continued)

Automatic Switchover Settings

To switchover a card automatically:

1. Set the protection switch for one of the automatic modes. From the *Slot Configuration Menu*, for the **N+1 Redundancy Switchover** option, choose one of the following:
 - **Narrowband Automatic** - This setting enables a switchover to automatically occur on just the T1/E1 devices in a T1/E1 redundancy group.
 - **Broadband Automatic** - This setting enables a switchover to automatically occur on the protected broadband modules only. The protected broadband modules may be all T3s or all STS-1s.
 - **Automatic** - This setting enables a switchover to automatically occur on both the narrowband and broadband redundancy groups.
 - **Manual** - A switchover will not occur until the operator does so manually. Not recommended.
-

Restoring after a Switchover

Definition

A restore is an action that occurs when traffic is returned to a primary device that was previously offline and being protected by a secondary device.

Manual Restore

Restoring can only be accomplished manually .

To manually restore a primary device:

1. From the *Node Summary Menu*, move the cursor to the slot to be restored and type **R**.

The primary device must be in *Standby* mode in order for it to be restored and go *On-line*.

If the selected device can not be restored (i.e., switched over) an error message will appear on the screen and no other action will occur.

Protection Switch Main Menu

If you have an N+1 Protection Switch with the DACS II AX 11 system, the Protection Switch's device state should read *Online*. If so, place your cursor on the PSX field and press **<Enter>** to access the N+1 Protection Switch's Main Menu. The Protection Switch Main Menu displays (Figure 10-11).

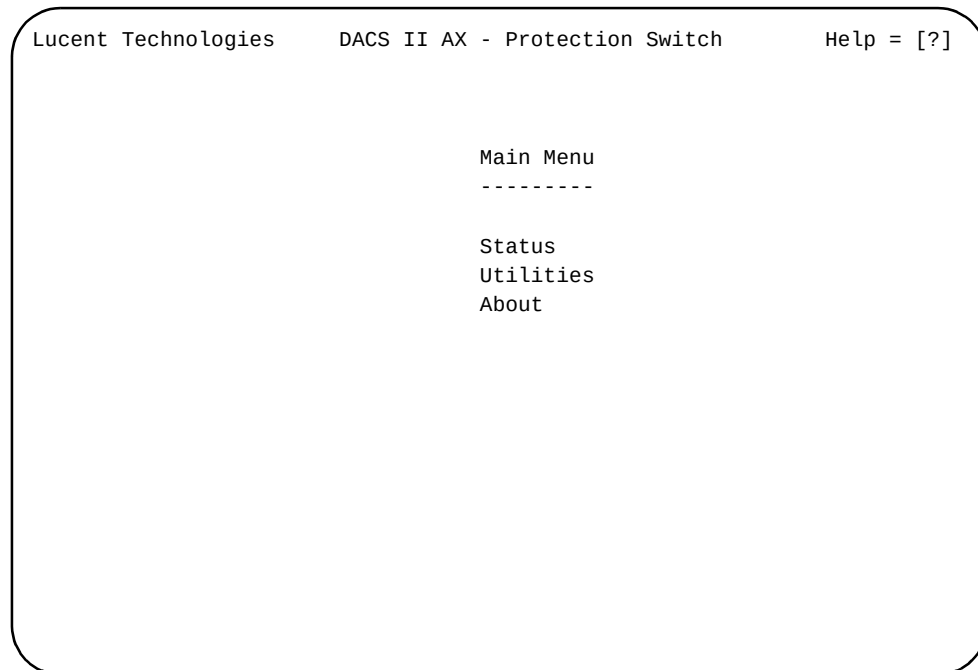


Figure 10-11. Protection Switch Main Menu

To access any of the menus on the N+1 Protection Switch Main Menu, place your cursor on the desired field and press **<Enter>**.

From the **Status** menu, you can view the status of the Switch box, whether a device has been switched, which slot a redundant device is protecting, and if the device is missing a cable, not present or okay.

From the **Utilities** menu, you can reset the device.

The **About** menu displays information about the software release and version, and details about the rear card.

Protection Switch Status Menu

```

Lucent Technologies          DACS II AX - Protection Switch          Help = [?]

                                Status Menu
                                -----

Slot#   Card Type           Card Status   Switch State   Switch Status
-----
01      T1/E1 Secondary     Ok            Switched       protect slot 07 Ok
02      T1/E1 Primary       Cable Missing Normal                    Ok
03      T1/E1 Primary       Cable Missing Normal                    Ok
04      T1/E1 Primary       Cable Missing Normal                    Ok
05      T1/E1 Primary       Cable Missing Normal                    Ok
06      T1/E1 Primary       Cable Missing Normal                    Ok
07      T1/E1 Primary       Cable Missing Switched                    Ok
08      T3 Primary          Ok            Normal                    Ok
09      Card Not Present    Not Present   Not Present     Not Present
10      Card Not Present    Not Present   Not Present     Not Present
11      T3 Secondary        Ok            Normal                    Ok

Power Supply A Status.: Bad           Fan Speed.....: High
Power Supply B Status.: Ok            Fan Maintenance: Auto
Controller Card Status: Ok
Chassis Temperature...: 110 F/43 C

```

Figure 10-12. Protection Switch Status Menu

The **Status** menu, reveals the card type and its status (i.e., if the card is *ok*, *cable missing*, or *not present*). This menu also exposes the switch state (for example, the screen displayed in Figure 10-12 shows the T1/E1 redundant device is protecting the T1/E1 primary card in slot 7). As you can see, slots 9 and 10 do not have cards installed, so a *Not Present* condition appears in the *Card Status* and *Switch Status* columns.

The **Card Status** field determines the status of the card. The status will either be *Ok*, *Cable Missing* or *Not Present*.

The **Switch State** field determines the status of the relay switch. The status will either be *Normal* or *Switched*.

The **Switch Status** field determines if there is a discrepancy between the switchover command from SMC II and the position of the relay. The status will either be *Ok*, *Not Present*, *protect slot xx*, or *Malfunction*. *If a malfunction does appear, immediately contact your technical support representative or Lucent Technologies.*

The **Power Supply A Status** field displays the status of the power supply in the N+1 Protection Switch. It will either register *OK* or *Fault*.

The **Power Supply B Status** field displays the status of the power supply in the N+1 Protection Switch. It will either be *OK* or *Fault*.

The Chassis Temperature field detects and controls the ambient temperature of the N+1 Protection Switch and DACS II AX 11.

The **Fan Speed/Fan Maintenance fields** indicate the speed of the fans in response to the ambient temperature and the status of the fans. There are three fans in the assembly used for the cooling system. An alarm will occur if one of the following three conditions occur:

- **cooler** - the fan will throttle down when the temperature cools.
- **fan problem** - if there is a problem with one of the fans, an alarm will occur.
- **NEBs filter is dirty** - a dirty fan will slow the speed of the fan, which will trigger the alarm.

The N+1 Protection Switch is designed to provide auxiliary cooling for the DACS II AX. When the N+1 Protection Switch unit powers up, the fan speed default is *Auto*. The fan speed is based on the temperature inside the N+1 Protection Switch, which is directly related to the surrounding temperature. When the system is at *Auto*, the fan speed changes automatically depending upon room temperature. When *Auto* is on, the fan settings are as follows :

- **Low** - below 30 degrees C (86 degrees F)
- **Medium** - 30 degrees C (86 degrees F) to 40 degrees C (104 degrees F)
- **High** - above 40 degrees C (104 degrees F)

If the N+1 Protection Switch is not in *Auto* mode, you can set the fan speed directly to *Off*, *Low*, *Medium* or *High*.

NOTE: Taking the N+1 Protection out of *Auto* mode is inadvisable.

Fan #01, #02, #03: This field displays the status of the fans. The status will indicate whether the fan's state is *OK* or *Fault*.

Protection Switch Utilities Menu

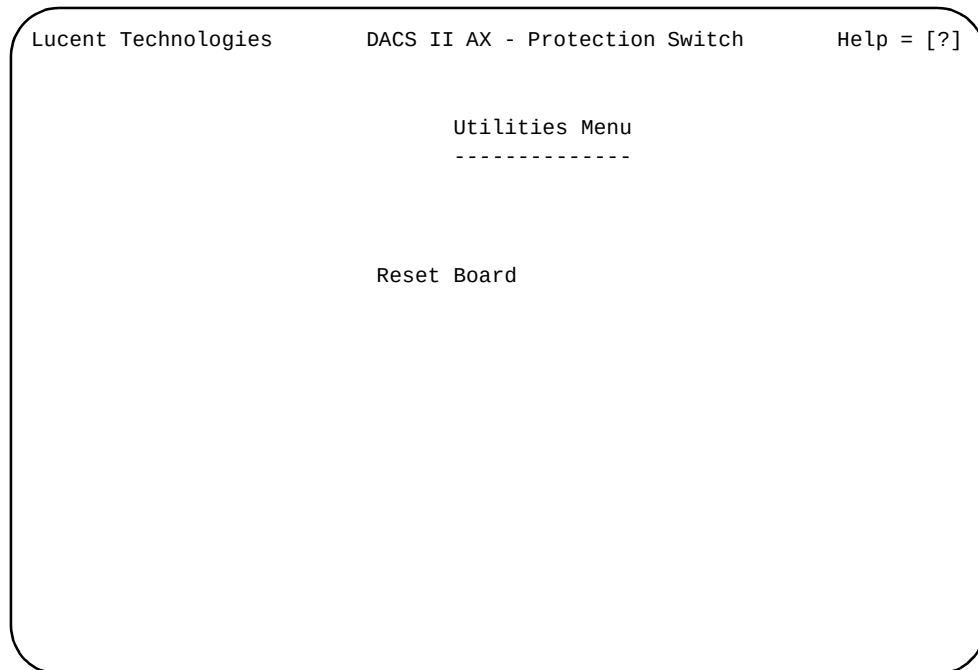


Figure 10-13. Protection Switch Utilities Menu

The Reset Board causes the Protection Switch Controller board to initialize in the same manner as power up. During this boot up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

Protection Switch About Menu

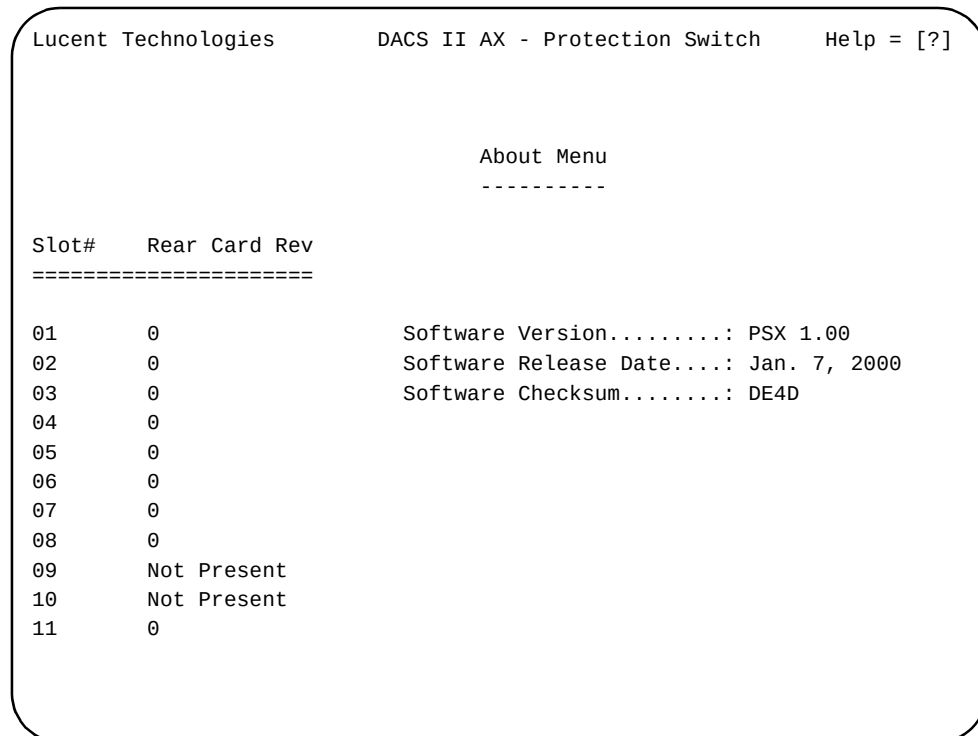


Figure 10-14. Protection Switch About Menu

The *About Menu* displays information about the rear card hardware revision and the software revision level of the Protection Switch Controller Card.

Changing the Fan Setting

Procedure

To change the fan setting:

1. From the DACS II AX Node Summary Menu, place your cursor on the *PSX* field and press **<Enter>**.
2. From the N+1 Protection Switch Main Menu, place your cursor on the *Status* field and press **<Enter>**. The following menu appears:

Lucent Technologies		DACS II AX - Protection Switch		Help = [?]
Status Menu				

Slot#	Card Type	Card Status	Switch State	Switch Status

01	T1/E1 Secondary	Ok	Normal	Ok
02	T1/E1 Primary	Ok	Normal	Ok
03	T1/E1 Primary	Ok	Normal	Ok
04	T1/E1 Primary	Ok	Normal	Ok
05	T1/E1 Primary	Ok	Normal	Ok
06	T1/E1 Primary	Cable Missing	Normal	Ok
07	T1/E1 Primary	Ok	Normal	Ok
08	T3 Primary	Ok	Normal	Ok
09	T3 Primary	Ok	Normal	Ok
10	T3 Primary	Ok	Normal	Ok
11	T3 Secondary	Ok	Normal	Ok
Power Supply A Status.: Ok		Fan Maintenance: Auto		Fan #01: Ok
Power Supply B Status.: Ok		Fan Speed.....: Low		Fan #02: Ok
Chassis Temperature...: 85 F/29 C				Fan #03: Ok

Figure 10-15. N+1 Protection Switch Status Menu

3. Place your cursor on the *Fan Maintenance* field and press **<Enter>**. Toggle between the following options to change the fan's speed:

- Auto
- Off
- Low
- Medium
- High

As you toggle between options in the *Fan Maintenance* field, the corresponding option will appear in the *Fan Speed* field (it will take approximately 2-3 seconds for the corresponding option to appear). The only option that will not correspond is the Auto option. The Fan Maintenance field will indicate *Auto* while the Fan Speed field will register either *Low*, *Medium* or *High*. The speed setting is chosen automatically by the controller card, with the setting dependent on the temperature of the environment in which the N+1 Protection Switch is located.

Air Filter Maintenance

Description

The N+1 Protection Switch draws air into the DACS II AX 11 through a NEBS (Network Equipment Building System) compliant filter. Check your filter at least every 90 days to insure proper functioning. How often a filter has to be cleaned or changed depends on the DACS II AX environment. A clean working environment will cut down on the amount of dirt and dust entering the filter which will reduce the cleaning frequency.

Required Tools

You will need a flathead screwdriver to remove the filter.

Procedure

To clean/replace the air filter, complete the following steps:

1. Turn off the fans. From the Node Summary Menu, select PSX, then select Status. For Fan Speed, select Off. Type X to save and return to the Node Summary Menu. For more detail, see Changing the Fan Setting: page 10-37.
2. Locate the grill containing the filter on the front of the N+1 Protection Switch. Unscrew the four captive screws on the grill and remove the grill from the N+1 Protection Switch.



Figure 10-16. Front view of N+1 Protection Switch shows the NEBS Compliant Filter

3. Slide the cartridge holding the filter out of the grill.

4. Clean the filter by vacuuming or washing using water and a mild soap. Replace the filter, if necessary.
 5. To put the filter back, slide the cartridge into the guides on the grill, with the filter cartridge guard facing the fans. Re-fasten the grill onto the N+1 Protection Switch and tighten the captive screws.
-

Changing the Fan Assembly

Description

The N+1 Protection Switch can detect a change in fan speed. A slow condition could be due to a failure of a fan such as worn bearings, open winding in the motor or shorted winding in the motor.

If a fan fails, the entire fan assembly unit must be replaced.

Procedure

To change the fan assembly:

1. Turn off the fans. From the Node Summary Menu, select PSX, then select Status. For Fan Speed, select Off. Type **X** to save and return to the Node Summary Menu. For more detail, see Changing the Fan Setting: page 10-37.
2. Locate the grill containing the filter on the front of the N+1 Protection Switch. Unscrew the four screws on the grill and remove the grill from the N+1 Protection Switch.
3. Turn the four knurled nuts counter clockwise to remove the fan assembly.

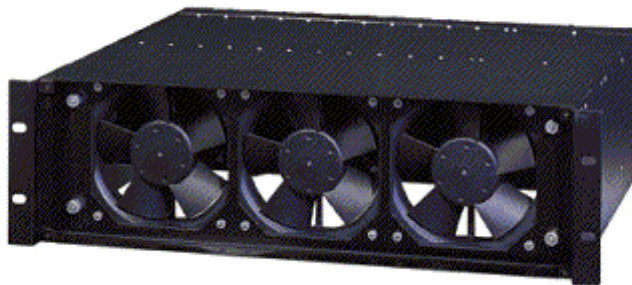


Figure 10-17. Front View of Fan Assembly

4. Disengage the fan connector from the PC board and pull out the fan assembly.
5. Engage the replacement fan assembly connector to the PC board, making sure it is properly connected.

6. Place the replacement fan assembly into position making sure the wiring is clear of the N+1 Protection Switch chassis. Line up the fan assembly unit with the threaded bolts. Turn the knurled nuts until tight.
 7. Replace the grill filter assembly.
 8. Go back to the Status Menu, scroll down to the *Fan Maintenance* field and press **<Enter>**.
 9. Change the fan position to *Auto*.
-

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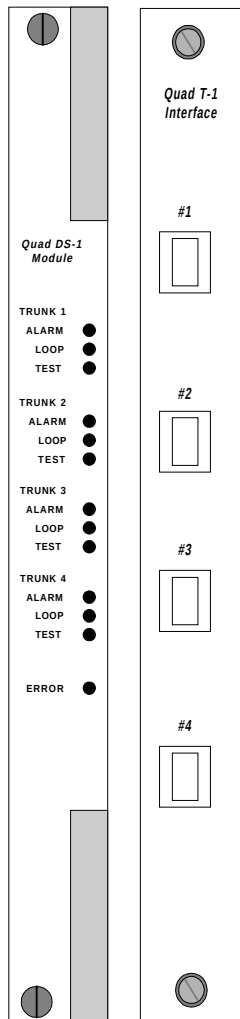
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Physical Description

The Quad DS-1 Application/Interface Module Set contains four DS-1 links, a microprocessor, and FLASH memory for program storage.

There are four sets of LEDs, one set for each trunk, and an ERROR LED located on the Quad DS-1 application module (Figure 11-1).



- **ALARM** - red indicates an alarm condition has occurred on the trunk.
- **LOOP** - yellow indicates a loopback condition has occurred on the trunk.
- **TEST** - green indicates a test is being performed on the trunk.
- **ERROR** - red indicates an error condition exists for this module.

The Quad DS-1 interface module provides the electrical interface for four short-haul or long-haul DS-1 circuits which are independently configurable at the system console. Four RJ-45 connectors are provided to terminate the DS-1 circuit cables.

If all LEDs flash simultaneously, this indicates the module has been forced out of service or no rear card is present.

Thumb screws are provided at the top and bottom of the bezels to secure the module in the chassis and to make an electrical connection to frame ground for FCC emission compliance. The electrical connection to frame ground also protects the module from static discharge.

➡ **NOTE:**
The N + 1 Protection Switch does not supply redundancy for the DS-1 module set.

Figure 11-1. Quad DS-1 Application/Interface Module Set

Regulatory Information

North America

The Quad DS-1 Module complies with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the rear card must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus is designed to meet all requirements of the Canadian Interference Causing Equipment Regulations.

FCC Customer Information

This equipment complies with Part 68 of the FCC rules. On the back or side of this equipment is a label that contains, among other information, the FCC certification number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

For single and two-line connections to the telephone network, the plug and jack used with this equipment must comply with FCC Part 68 rules. See Installation Instructions for details.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes to its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice so you can make the necessary modifications to maintain uninterrupted service.

**FCC Customer
Information
(Continued)**

If trouble is experienced with this equipment, for repair or warranty information, please contact Lucent Technologies technical support. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Type of Interface	1.544 Mbps Digital Channel
Facility Interface	04DU9-BN for SuperFrame (SF) D4 AMI format without line power
	04DU9-IKN for ANSI ESF AMI format without line power
Service Code	6.0N. Does not provide billing and encoded analog protection. Quad DS-1 interface card units use an integrated CSU. Affidavit to service provider may be required
Jack Arrangement	RJ48C
Ringer Equivalence	N/A

**Industry Canada
Statement**

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee that 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. 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 coordinated by a representative 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 utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

**Industry Canada
Statement
(Continued)**

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The **Ringer Equivalence Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Product Safety

Underwriters' Laboratories

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Europe

This equipment is in conformity with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

CTR 12/A1

following the provisions of the EMC Directive 89/336/EEC, the Low Voltage Directive 73/23/EEC, and the TTE Directive 91/263/EEC.

Before You Begin

- This chapter is written for ADMINISTRATOR-level users.
- A slot must first be configured for the module type and the Quad DS-1 module must be resident in a slot in the equipment chassis. A Quad DS-1 interface module must also be resident in the same numbered slot as the Quad DS-1 application module. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4 of this manual.
- For cabling and interface requirements, see Appendix B.

**NOTE:**

DACS II AX Quad T1, as displayed in the menus through out this text, is the same as DACS II AX Quad DS-1.

Slot Configuration

Procedure - Configure Slot

To configure a slot for the Quad DS-1 module:

1. From the DACS II AX Main Menu, place your cursor on the *System Configuration* field and press **<Enter>**, the following menu appears:

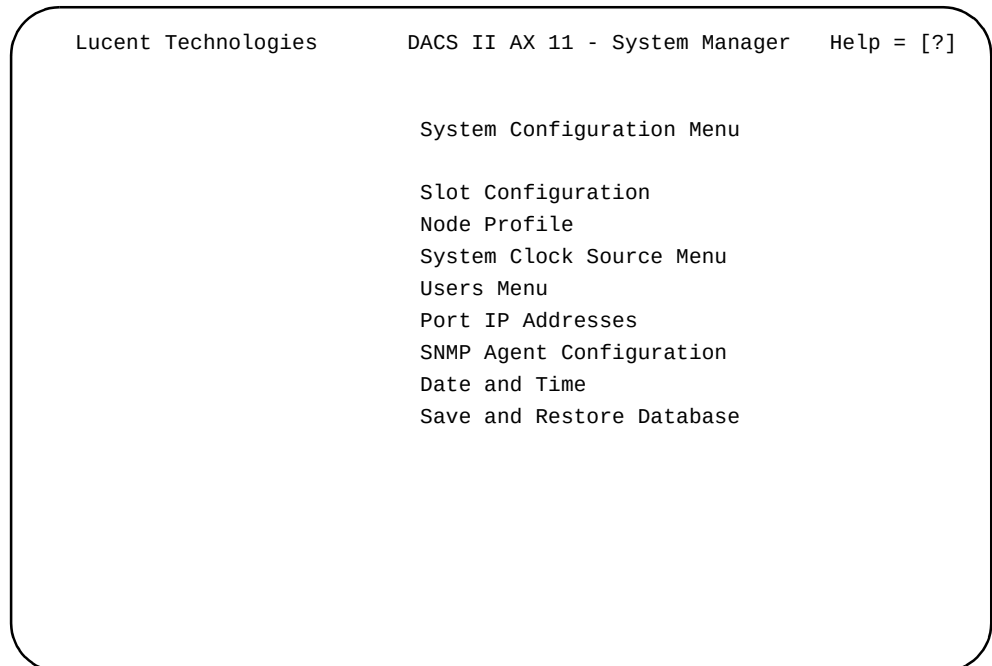


Figure 11-2. System Configuration Menu

2. Press **<Enter>** at the *Slot Configuration* field. The *Slot Configuration* menu appears displaying slots numbered from 1 to 4 (DACS II AX-4) or 1 to 11 (DACS II AX-11).

```

Lucent Technologies          DACS II AX 11 - System Manager    Help = [?]
                             Slot Configuration Menu

Slot#  Device Type          Name          Redundancy
-----
1      Octal T1/E1          Redundant      Enable
2      Quad DS-1            BERT test      Disable
3      Octal T1/E1          Loop One       Enable
4      Octal T1/E1          Loop Two       Enable
5      Octal T1/E1          Loop Three     Enable
6      Octal T1/E1          Loop Four      Enable
7      Octal T1/E1          Loop Five      Enable
8      Octal T1/E1          D/V Loop 1    Enable
9      Octal T1/E1          D/V Loop 2    Enable
10     T3                    Primary Lnk    Enable
11     T3                    Secondary      Enable

N+1 Redundancy:              Freeze
N+1 Redundancy Switchover:   Automatic
N+1 Redundancy Restore:      Manual

Change Card = [Enter key]    [D]elete Card

```

Figure 11-3. Slot Configuration Menu

3. Place your cursor on the desired slot #, where your Quad DS-1 module will reside, and press **<Enter>**. The *Slot Configuration* submenu appears.

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
Slot Configuration  
  
Slot name: slot 2  
Card type: Quad T1  
Redundancy: Disable
```

Figure 11-4. Slot Configuration Submenu

4. At the *Slot Configuration* submenu, place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number and press **<Enter>** again.
5. Move your cursor to the *Card Type* field and press **<Enter>** key until "Quad T1" is displayed.
6. Press **X** to save your configuration and return to the previous menu.



NOTE:

The same procedure applies when replacing an existing card in a slot. If you want to delete a card, press D and a message appears stating, "All existing connections for this slot will be deleted." Press Y(es) to confirm the action or N(o) to discontinue. If you want the empty slot to display as a blank, pull the module and restart the DACS II AX.

Quad DS-1 Main Menu

Procedure - Access DS-1 Main Menu

To access the DS-1 Main Menu:

1. From the DACS II AX Main Menu, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies          DACS II AX - System Manager          Help = [?]
Databases: InSync           N+1 Redundancy State: Disabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#   Configured Type      Device State   Alarm
-----
01      + Octal T1/E1         Standby        None
02      Quad DS-1             Online         None
03      + Octal T1/E1         Online         None      Clock Src
04      + Octal T1/E1         Online         None
05      + Octal T1/E1         Online         None
06      + Octal T1/E1         Online         None
07      + Octal T1/E1         Online         None
08      + Octal T1/E1         Online         None
09      + Octal T1/E1         Online         None
10      + T3                  Online         None
11      + T3                  Standby        None
SMCA    System Manager A      Standby        None
SMCB    System Manager B      Online         None
PSX     ProtectionSwitch      Not present    None

[C]lear error counts  [S]lot Cfg      [E]xpose      [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver  [R]estore

```

Figure 11-5. Node Summary Menu

2. Then place your cursor on the slot number where the Quad DS-1 module is located and press **<Enter>**. The *Quad DS-1 Main Menu* appears.



NOTE:

On the Node Summary Menu, the Configured Type must display "Quad DS-1" and the Device State must display "On-line" or "Standby" in order to access the DS-1 Module Main Menu. If the Device State is "Off-line", an alert message is generated.

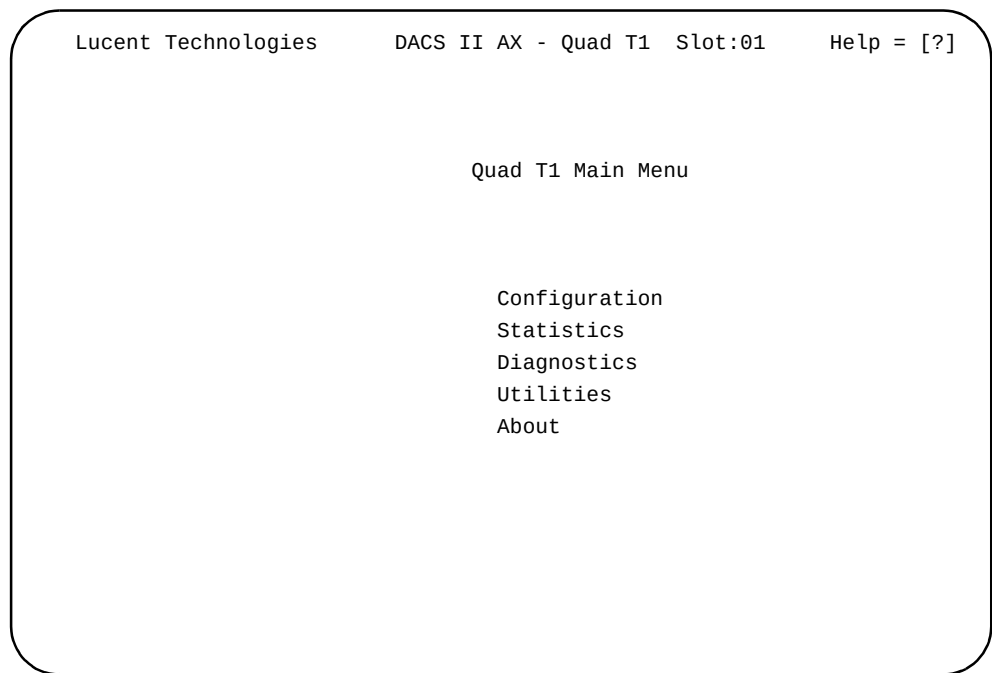


Figure 11-6. Quad DS-1 Main Menu

From the *Main Menu* you can configure the module, run diagnostic tests, access utilities, and display module identification (software and hardware revision levels).

Configuration Menu

Description

The Quad DS-1 Configuration Menu provides access to the Port Configuration submenu. From here, you can configure the ports. When a Quad DS-1 card is replaced, the old configuration is preserved.

Procedure - Configure Ports

To configure the Quad DS-1 module parameters:

1. From the Main Menu, place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies . DACS II AX 11 - Quad T1 Slot:01 Help = [?]

                                Quad T1 Card Port Configuration

                                Port #1      Port #2      Port #3      Port #4
Name.....: Port #1      Port #2      Port #3      Port #4
Framing.....: ESF        ESF        ESF        ESF
Line code...: B8ZS        B8ZS        B8ZS        B8ZS
LBO.....: 0 db          0 db          0 db          0 db
Density.....: Clear      Clear      Clear      Clear
Ntwk loops...: Enable    Enable    Enable    Enable
Yellow alarm: Yes        Yes        Yes        Yes
ESF format...: 54016      54016      54016      54016
Unused DS0's: Busy       Busy       Busy       Busy
Port Status : In Service  In Service In Service In Service

Cascade Leds when Idle: Yes
  
```

Figure 11-7. Quad T1 Card Port Configuration Menu

2. To change the configuration of a particular port, move your cursor to the field to be configured and press **<Enter>** to toggle between the field's options.
3. Press **X** to save changes. The following screen appears:

```

Lucent Technologies . DACS II AX 11 - Quad T1 Slot:01 Help = [?]

                                Quad T1 Card Port Configuration

      Port #1      Port #2      Port #3      Port #4
Name.....: Port #1
Framing.....: ESF ***** ESF
Line code...: B8ZS * * * * * B8ZS
LBO.....: 0 db * * * * * -MESSAGE!- * 0 db
Density.....: Clear * * * * * Clear
Ntwk loops...: Enable * * * * * Enable
Yellow alarm: Yes * * * * * Update configuration? * Yes
ESF format...: 54016 * * * * * * 54016
Unused DS0's: Busy * * * * * * Busy
Port Status : In Serv * * * * * Are you sure (Y/N)? * In Service
* * * * * *
Cascade Leds when Idl *****

```

Figure 11-8. Update Configuration Screen

4. Press **Y**(es) to save your changes or press **N**(o) to cancel changes and return to the Quad DS-1 *Main Menu*. Either selection returns you to the Quad DS-1 *Main Menu*.

**NOTE:**

Configuration parameters are determined by your local carrier.

LEDS Display

To configure the LEDS status:

1. From the Quad DS-1 *Port Configuration Menu*, place your cursor on the *Cascade Leds when Idle* field.
2. Press **<Enter>** to toggle between options, *Yes* or *No*.
3. To cascade LEDs, select **Yes**. Press **X** and the message "Update Configuration? Are you sure (Y/N)?" appears. Press **Y(es)** to save configuration and cascade LEDs or press **N(o)** to cancel configuration and return to the Quad DS-1 *Main Menu*.
4. To stop cascade, select **No**. Press **X** and the message "Update Configuration? Are you sure (Y/N)?" appears. Press **Y(es)** to save configuration and stop LED cascade, or press **N(o)** to cancel configuration and return to the Quad DS-1 *Main Menu*.

**NOTE:**

When there are no Alarm, Loop or Test conditions, all LEDs will cascade every five seconds when the Cascade LEDs When Idle option is enabled.

Configuration Menu Field Descriptions

These fields appear on the Quad T-1 Card Port Configuration menu (Figure 11-7):

Name: (*text field*) This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad DS-1. You may find it beneficial to use circuit numbers to name the ports.

Framing: (*option field*) This information must be obtained from the network supplier. Choose either *D4* or *ESF*.

D4 (SuperFrame) consists of 12 frames of 193 bits each for a total of 2316 bits. Each 193rd bit frame consists of 192 bits preceded by one framing bit (the F bit).

ESF (Extended SuperFrame) includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

Line Code: (*option field*) This information must be obtained from the network supplier. Choose between *AMI* (Alternate Mark Inversion) and *B8ZS* (Bipolar with 8 Zero Substitution).

LBO (Line Build Out): (*option field*) This parameter should be set to 0 db unless the network supplier specifically requests otherwise. The options are -0, -7.5, -15 or -22 db.

Density: (*option field*) This information must be obtained from the network supplier. Choose *Clear* or *62411*. A "Clear" network imposes no "ones density" requirements on the user. A "62411" network complies with AT&T Technical Reference #62411 and limits the DACS II AX Quad DS-1 module transmission to no more than fifteen consecutive zeroes. If the Line Code entry is "*B8ZS*," choose "*Clear*." If the Line Code entry is "*AMI*," choose *62411*.

Ntwk loops (Network Loops): (*option field*) This entry determines the DS-1 module's ability to respond to diagnostic commands received from the network supplier. The options are *Enable* and *Disable*. Select "*Enable*" unless the commands are to be passed to another DS-1 device that will respond.

Yellow Alarm: (*option field*) *Yes* indicates that the T1 circuit will discard data and send a yellow alarm if it is in a red alarm condition for three seconds. *Yes* must be chosen if the network supplier is a common carrier, such as a telephone company.

ESF Format: (*option field*) This entry describes the types of ESF network commands that the DS-1 module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.

Unused DS0s: (*option field*) Idle Code displays the state of unused DS0s as either *Busy* (All Ones) or *Idle* (0).

Port Status: (*option field*) This field displays the status of the port. The status will either be *In Service*, (i.e., active) or *Out of Service*, (i.e., inactive).

Cascade Leds when Idle: (*option field*) Cascade LEDs is a state in which the inactive front panel LEDs (excluding the ERROR LED) flash in a sequential manner. This feature indicates that the card is functioning in a proper manner. Any state that may activate an LED (e.g., port in loop, port in test or DCD on) will cancel the LED cascade. Disable this feature to de-activate the front panel LEDs.

Statistics Menu

The Statistics Menu exposes the ESF Statistics and ESF Registers.

- The ESF Statistics submenu displays both current and 24-hour ESF statistics. The Current Statistics column displays the counts for the current time interval (maximum fifteen minutes). The 24-Hour Statistics column displays the counts for the preceding 24-hour period.
- The ESF Registers submenu gives the same information as the ESF Statistics Menu but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

Procedure - Display ESF Statistics

To display ESF statistics:

1. From the Quad DS-1 *Main Menu*, place your cursor on the *Statistics* field and press **<Enter>**. The following menu appears:

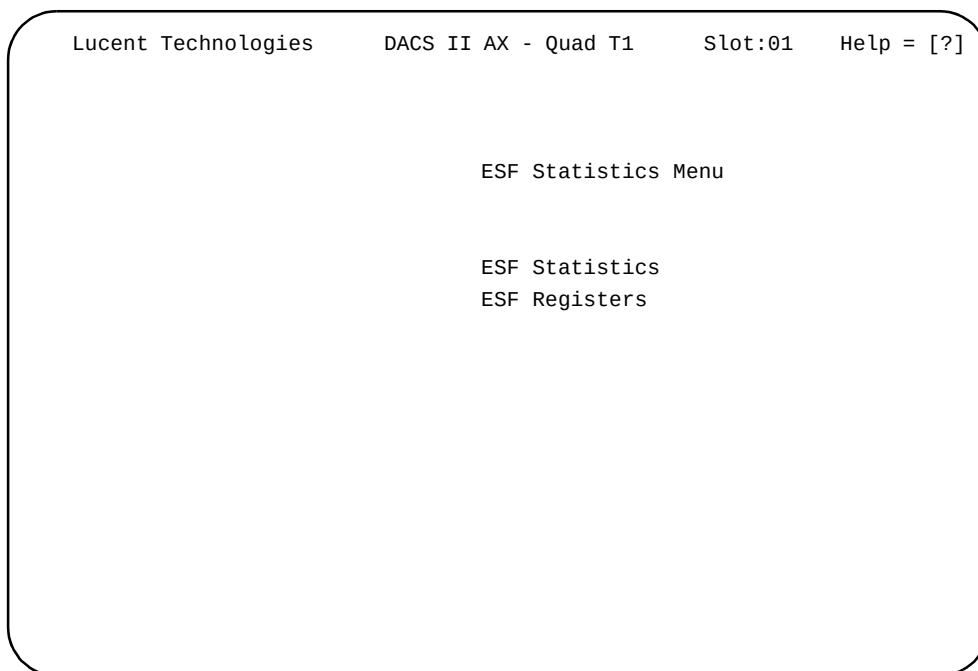


Figure 11-9. ESF Statistics Menu

Position the cursor on the *ESF Statistics* field press **<Enter>**. The following screen appears:

Lucent Technologies		DACS II AX - Quad T1		Slot:02		Help = [?]	
Quad T-1 ESF Statistics							
	Port #1	Port #2		Port #3		Port #4	
Register	Curr 24Hr	Curr 24Hr		Curr 24Hr		Curr 24Hr	
Errored secs.....:1	0	1	0	1	0	1	0
Failed secs(UAS):0	0	0	0	0	0	0	0
Severe error secs:1	0	1	0	1	0	1	0
Bursty error secs:0	0	0	0	0	0	0	0
Loss of frame cnt:0	0	0	0	0	0	0	0
Time in interval.:112		112		112		112	
# Valid intervals:0		0		0		0	
ESF status.....:00000000		00000000		00000000		00000000	

Figure 11-10. ESF Statistics Screen

The *ESF Statistics* display is a read-only screen. It allows you to view both current and 24-hour ESF statistics. The Current Statistics column displays the counts for the current time interval (maximum 15 minutes). The 24 Hour Statistics column displays the counts for the preceding 24-hour period.

ESF Statistics Field Descriptions

The following fields appear on the ESF Statistics screen (Figure 11-10).

Errored secs: The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed secs (UAS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred.

Severe error secs: A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty error secs: A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Loss of frame cnt: A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time in interval: A timer that tracks the number of seconds (0-900) in one 15-minute interval.

Valid intervals: A counter that tracks the total number of 15 minute intervals in a 24 hour period (up to 96).

ESF status: This field defines the status of the T1 line. The status is defined by an eight digit number that is described below:

FU0000L0

Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.

Digit #2 - "U" or "0" where "U" indicates an unavailable signal state.

Digit #3 through #6 and #8 are always "0."

Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.

**Procedure -
Display ESF
Registers**

To display ESF registers:

1. From the *ESF Statistics Menu*, use the **<SpaceBar>** to navigate to the *ESF Registers* field and press **<Enter>**. The following menu appears:

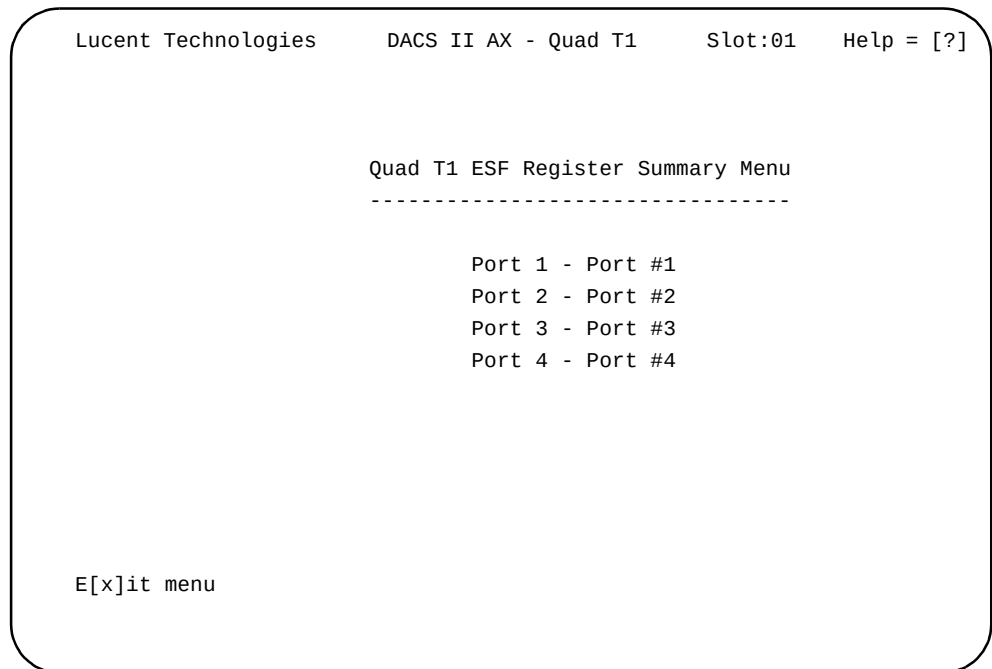


Figure 11-11. ESF Registers Summary Menu

2. Select a port and press **<Enter>** to access the ESF Registers. The following screen appears:

Lucent Technologies

DACS II AX Quad T1 Module

Slot:01

Help = [?]

ESF Registers

INT	ES	FS	SES	BES	INT	ES	FS	SES	BES	INT	ES	FS	SES	BES
01.	000	000	000	000	17.	000	000	000	000	33.	000	000	000	000
02.	000	000	000	000	18.	000	000	000	000	34.	000	000	000	000
03.	000	000	000	000	19.	000	000	000	000	35.	000	000	000	000
04.	000	000	000	000	20.	001	000	001	000	36.	000	000	000	000
05.	000	000	000	000	21.	000	000	000	000	37.	000	000	000	000
06.	000	000	000	000	22.	000	000	000	000	38.	000	000	000	000
07.	000	000	000	000	23.	000	000	000	000	39.	000	000	000	000
08.	000	000	000	000	24.	000	000	000	000	40.	000	000	000	000
09.	000	000	000	000	25.	000	000	000	000	41.	000	000	000	000
10.	000	000	000	000	26.	000	000	000	000	42.	000	000	000	000
11.	000	000	000	000	27.	000	000	000	000	43.	000	000	000	000
12.	000	000	000	000	28.	000	000	000	000	44.	000	000	000	000
13.	000	000	000	000	29.	000	000	000	000	45.	000	000	000	000
14.	000	000	000	000	30.	000	000	000	000	46.	000	000	000	000
15.	000	000	000	000	31.	000	000	000	000	47.	000	000	000	000
16.	000	000	000	000	32.	000	000	000	000	48.	000	000	000	000

Next/previous page = [Return/Space]

Figure 11-12. ESF Registers Screen

The ESF Registers screen is a read-only display. Press the **<Enter>** key or **<SpaceBar>** to view the next set of intervals.

ESF Registers Field Descriptions

These fields are on the ESF Registers screen (Figure 11-12):

INT(Interval): This column represents the interval number for the ninety-six separate 15-minute intervals preceding the current interval, with 01 being the most recent.

Errored Seconds (ES): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed Seconds (FS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of severely errored seconds that have occurred.

Severely Errored Seconds (SES): A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty Errored Seconds (BES): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Next/previous page: *(option field)* Press <Enter> or <Spacebar> to navigate to the remaining intervals.

Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks and built-in BERT.

There are multiple loopback options. Each of the 4 T1 links can be independently looped back. The Quad DS-1 line can also be looped back. Loopbacks can occur towards the line or towards the backplane.

The built-in BERT generator and testers can be used along with loopbacks to test and determine the status of the Quad DS-1 module. They may also be used in conjunction with diagnostic facilities on other DACS II AX cards to qualify operation of the backplane connections.

Procedure - View Diagnostics

To view diagnostics:

1. From the Quad DS-1 *Main Menu*, place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies    DACS II AX - Quad T1    Slot:01    Help = [?]

                                Diagnostic Menu
Name.....:              Port #2          Port #3          Port #4
Port Status....: In Service    In Service      In Service      In Service

Loop selection.: Off          Off            Off            Off

NI BERT.....: Off            Off            Off            Off
Error seconds...: 0            0              0              0
Seconds in test: 0            0              0              0

                                State ErrSec   State ErrSec   State ErrSec   State ErrSec
AIS.....: No    0            No    0            No    0            No    0
RED.....: No    0            No    0            No    0            No    0
YEL.....: No    0            No    0            No    0            No    0
Ferr.....: No    3            No    2            No    1            No    1
CRC6.....: No    3            No    2            No    1            No    1
BPV.....: No    2            No    2            No    1            No    1
LOS.....: No    0            No    0            No    0            No    0
Frame Slip.....: No    0            No    0            No    0            No    0

[R]eset counts      Insert bert [e]rrors
  
```

Figure 11-13. Quad DS-1 Diagnostics Menu

From the *Diagnostics Menu*, a submenu may be viewed or invoked to perform additional diagnostic actions such as loopbacks, BERT, and viewing additional statistics. To insert BERT errors, press **e**, and to reset counters, press **R**.

Procedure - Configure Loop Type

To configure the loop type:

1. Position the cursor on *Loop selection* press **<Enter>**. The following menu appears:

```
Lucent Technologies      DACS II AX - Quad T1      Slot:01      Help = [?]

                          Loop Diagnostics Manager

                          Loops: Off

                          **Applicable only for User Defined Loop Selection

Activate Code Length.....[code is left justified, b0 unused]: 4 Bit
Deactivate Code Length.... [code is left justified, b0 unused]: 4 Bit
Unframed...[causes the generator to overwrite the framing bit]: No
Loop Activate Code..[binary][b7.....b0] [tx order->b7 first]: 00000000
Loop DeActivate Code[binary][b7.....b0] [tx order->b7 first]: 00000000
```

Figure 11-14. Loop Diagnostics Manager

2. Press **<Enter>** to toggle between the following options: *Local*, *Line*, *Payload*, *CSU Line Lp*, *CSU Lp Unframed*, *Smart Jack 58-U*, *User Defined* or *Off*.

The *Loop Diagnostic* options are described in Table 11-1.

3. Press **X** and the message "Are you sure (Y/N)?" appears. Press **Y** to save and enable loop configuration or select **N** to cancel change and return to the *Diagnostics Menu*.

**Procedure -
Configure NI
BERT**

To configure the Network Interface Bit Error Rate Test (NI Bert):

From the Quad DS-1 *Diagnostic Menu*, place your cursor on the *NI BERT* field and press **<Enter>**. The following menu appears:

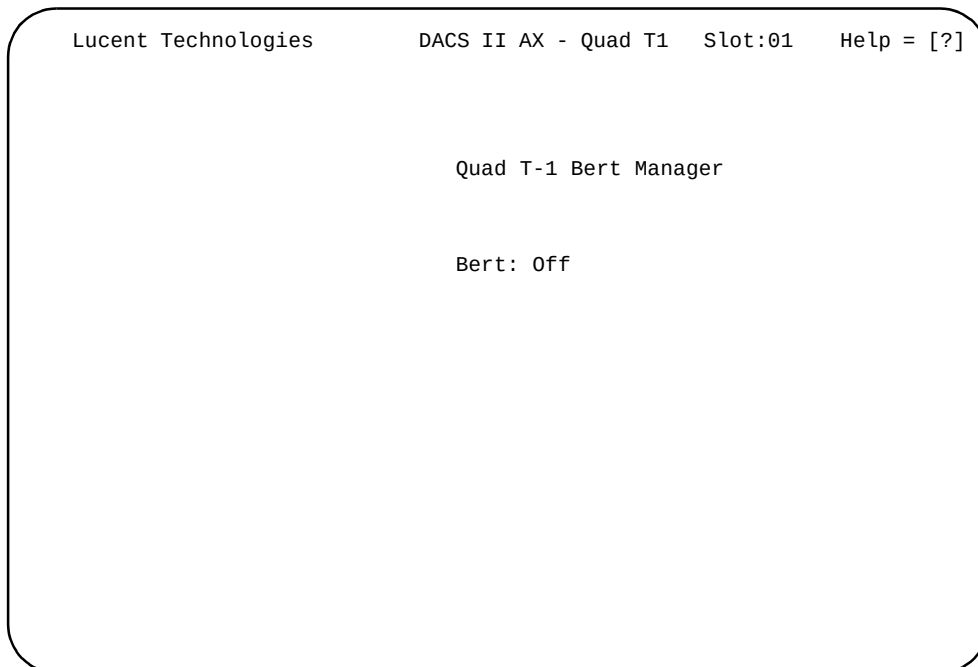


Figure 11-15. Quad DS-1 Bert Manager

4. Position the cursor on the *Bert:* field, and press **<Enter>** to toggle between the following options: *Off*, *2047*, *3 of 24*, *All 1's*, *All 0's* or *QRSS*.
5. Press **X** and the message "Send (the option you choose i.e., 2047). Are you sure (Y/N)?" appears. Press **Y** to *save and enable Bert* or press **N** to cancel configuration and return to the *Diagnostics Menu*.

**Procedure - Stop
BERT**

To stop a Bert Test:

1. From the *Diagnostic Menu*, place your cursor on the *BERT* field and press **<Enter>**.
2. From the *Quad DS-1 Bert Manager* submenu, position the cursor on the *Bert:* field, and press **<Enter>** until *Off* appears.
3. Press **X**. The message "Turn OFF Bert? Are you sure (Y/N)?" appears. Press **Y** to end test.

Diagnostics Menu Field Descriptions

These fields appear on the Quad DS1 Diagnostics Manager Menu (Figure 11-13):

Name: Displays the name of each port on the DS-1 channel.

Port Status: This field displays the status of the port. The status will either be *In Service* or *Out of Service*.

Loop selection: Displays the type of diagnostic loop that has been enabled. If you turn the local loop *"ON,"* the front panel *"LOOP"* LED will illuminate and local testing can be performed by external DTE equipment or by the DACS II AX's internal BERT.

Table 11-1. Loop Selections

Loop selections	Loop names	Descriptions
Local	Local Loop	Loops DS-1 back to card
Line	Line Loop	Loops DS-1 to network
Payload	Payload Loop	Loops DS-1 to network. Signal is disassembled and reassembled through the card's framer
CSU Line Lp	CSU Line Loop	Loops remote CSU toward DACS II AX
CSU Lp Unframed	CSU Loop Unframed	Loops remote CSU toward DACS II AX, DS-1 unframed
Smart Jack 58-U	Smart Jack 58-U	Loops remote Smart Jack towards DACS II AX
User Defined	User Defined	Allows you to set up code that is defined by the user (e.g., activate/deactivate code length, loop activate/deactivate code)
Off	Off	No loops

NI BERT: This is useful for testing the bit error rate of the communication circuit via the NI. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.

Error seconds: This read-only count represents the number of errored seconds that occurred in a one second period while the Quad DS-1 module was in test.

Seconds in test: This read-only count represents the number of seconds the Quad DS-1 module was in test.

State: This column shows whether the alarm is active or inactive.

ErrSec: This column displays a read-only count to represent the number of errored seconds that occurred in a one second period while the DS-1 module was in test.

AIS (All Ones): An unframed "*all ones*" condition has been detected.

RED (Red Alarm): A "*loss of frame alignment*" has occurred and synchronization has been lost.

YEL (Yellow Alarm): A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not correctly receiving the DACS II AX signal (i.e., the network is not in sync or a red alarm has occurred).

Ferr (framing errors): One or more frame alignment bit errors have been detected. This does not mean, however, that synchronization has been lost.

CRC6 (Cyclic Redundancy Check): One or more CRC6 block errors have been detected. The D4 framing does not include CRC6; the Quad DS-1 module replaces that parameter.

BPV (Bipolar Violations): Bipolar violations have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.

LOS (Loss of Signal Detection): This indicates a loss of signal detection. No signal is present on the RX pair to the DACS II AX DS-1 module (DS-1 loop).

Frame Slip: *Frame Slip* is indicated if slip has been detected in the receive path.

Commands

[R]eset counts: Clears all counts.

Insert Bert [e]rrors: For test purposes, insert BERT errors.

Utilities Menu

**WARNING:**

The fields shown in this menu should not be accessed or configured unless you are established as a high level user; they are only for debugging purposes. It is strongly suggested that you do not use Utilities unless prompted to do so by a Lucent Technologies technical support representative.

Procedure - Access Utilities

To access the Utilities:

1. From the Quad DS-1 *Main Menu*, place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

```
Lucent Technologies      DACS II AX - Quad T1      Slot:01      Help = [?]  
  
                          Quad T-1 Utilities  
  
                          Board Status: In Service  
                          Reset Quad T-1 Board  
                          Monitor System Manager Clock  
                          Voice Control Signal Display  
                          Dump Connection Statistics  
                          Reload Connection Map  
                          Refresh Connection Map  
                          Trunk Conditioning
```

Figure 11-16. Utilities Menu

Procedure - Set Board Status

To set the board status:

The Board Status screen allows the Administrator to put a device *in service* or *out of service*.

1. Place your cursor on the *Board Status: In Service* field and press **<Enter>**.
The following screen appears:

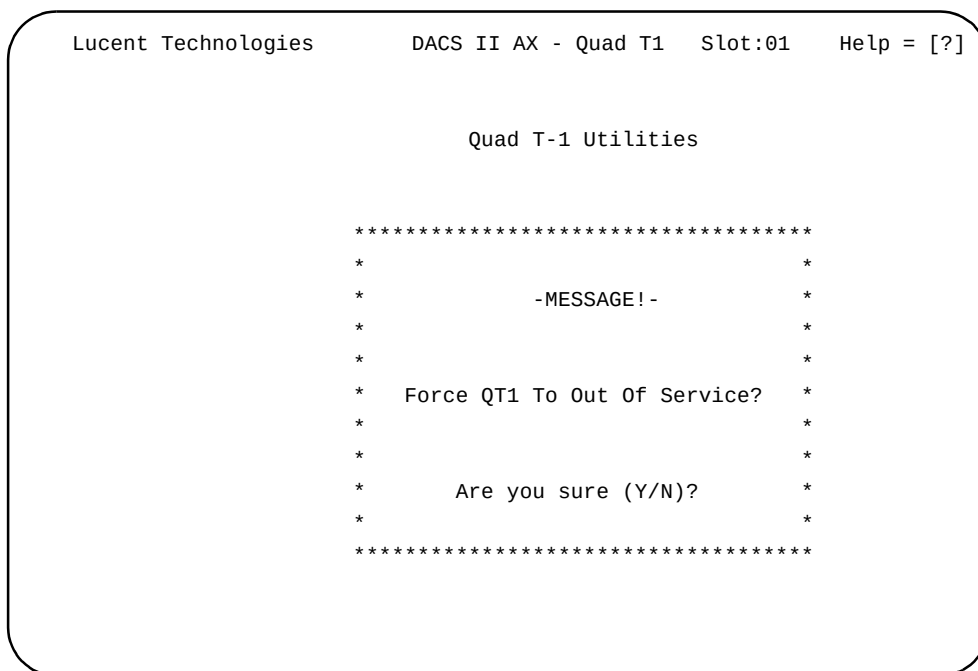


Figure 11-17. Board Status Screen

2. Press **Y** to force Quad DS-1 *Out of Service* or press **N** to return to the *Utilities Menu*.

**NOTE:**

The ERROR LED turns red when the Quad DS-1 module is set to Out of Service.

**Procedure -
Change to In
Service**

To change the board status to in service:

1. From the Quad DS-1 *Utilities Menu*, select the *Board Status - Out of Service* field and press **<Enter>**. The following screen appears:

```

Lucent Technologies      DACS II AX - Quad T1      Slot:01      Help = [?]

                                Quad T-1 Utilities

*****
*                                                                    *
*                                -MESSAGE!-                            *
*                                                                    *
* Force QT1 To In Service?  **QT1 Board Will Reset**                *
*                                                                    *
*                                Are you sure (Y/N)?                    *
*                                                                    *
*****

```

Figure 11-18. Change Board Status Screen

2. Press **Y** to reset Board Status to *In Service*. The following message appears: "Reset this Quad DS-1 Board? Are you sure (Y/N)?" Press **Y** and the next message appears: "Alert! Please wait while we establish communications with the system manager! Press any key to continue."
3. Press **N** to leave the Board Status as *Out of Service*.

**NOTE:**

It can take up to 20 seconds for the Board Status to change to In Service. When the status changes to In Service, the red ERROR LED goes out and you are returned to the Node Summary Menu. The Quad DS-1 module's state may cycle through a combination of "On-line", "Standby", and "Out of Service", and finally "On-line". This is a normal occurrence when the device resets.

Procedure - Reset Board

To reset the board:

The Reset utility causes the Quad DS-1 module to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

1. From the Quad DS-1 *Utilities Menu*, place your cursor on the *Reset Quad DS-1 Board* field and press **<Enter>**. The following screen appears:

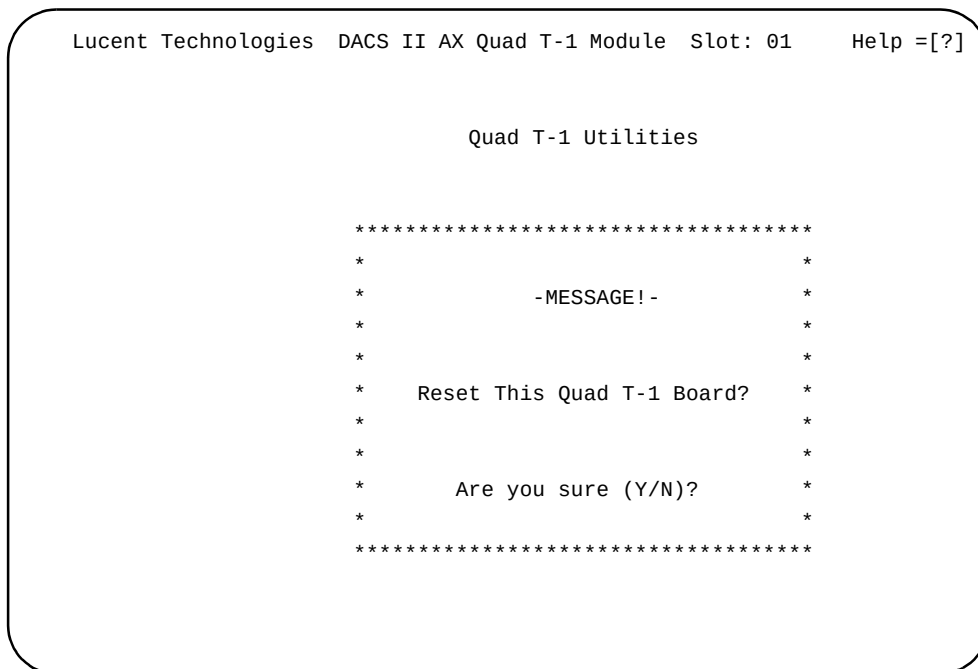


Figure 11-19. Reset Quad DS-1 Board Screen

2. Press **N** to cancel reset.
3. Press **Y** to reset device and the next screen appears with the following message: "Alert! Please wait while we establish communications with the system manager! Press any key to continue." After a few seconds you are returned to the *Node Summary Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, the Quad DS-1 module's state may cycle through a combination of "On-line", "Standby", and "Out of Service", and finally "On-line". This is a normal occurrence when the device resets.

**Procedure -
Monitor System
Manager Clock**

To access the monitor system manager clock:

The *Monitor System Manager Clock* is a view-only screen that displays the status of vital system timing and the backplane integrity of all slots to indicate if the device is on the bus.

1. From the Quad DS-1 *Utilities Menu*, place your cursor on the *Monitor System Manager Clock* field and press **<Enter>**. The following screen appears:

```

Lucent Technologies   DACS II AX Quad T-1 Module Slot: 01   Help = [?]

                                Monitor Backplane Integrity

Slot #      Slot #      Slot #      Pattern      Patt.      Status
-----      Address      Received      Address      Rcv      (Ignore for QHS)
Slot #1      0x00205007      01      0x00205008      08      ... OK ...
Slot #2      0x00205009      02      0x0020500a      09      ... OK ...
Slot #3      0x0020500b      03      0x0020500c      07      ... OK ...
Slot #4      0x0020500d      0f      0x0020500e      0f
Slot #5      0x0020500f      0f      0x00205010      0f
Slot #6      0x00205011      0f      0x00205012      0f
Slot #7      0x00205013      0f      0x00205014      0f
Slot #8      0x00205015      0f      0x00205016      0f
Slot #9      0x00205017      0f      0x00205018      0f
Slot #10     0x00205019      0f      0x0020501a      0f
Slot #11     0x0020501b      0f      0x0020501c      0f

Lost System Clock Count.: 1
Lost Frame Sync Count...: 1
OnBusBadClock Count: 0
OffBusGoodClock Ctr: 0

Invalid Signal Ram locations:0
Total Scanner Sweeps:31444
Total Signal Dirty Sweeps:0

[R]eset Clock Cntrs [C]lear Ram Cntrs

```

Figure 11-20. Monitor Backplane Integrity Screen

2. To reset the clock counts press **[R]**.
3. To clear the Ram counts press **[C]**.
4. To return to the *Utilities Menu* press **X**.

Monitor Backplane Integrity Field Descriptions

These fields appear on the Monitor Backplane Integrity Screen (Figure 11-20).

Slot #: Displays the slot number in the backplane.

Slot # Address: Displays the hexadecimal address of the slot in the backplane.

Slot # Received: Displays the received slot number (hexadecimal).

Pattern Address: Displays the hexadecimal address of the pattern.

Pattern Received: A pattern is being received that indicates the status of the backplane connection. A received pattern of 00 causes "OK" status to be indicated in the *Status* field.

Status (ignore for QHS): Shows the status of the slot's connection to the backplane.

Procedure - Voice Control Signal Display

To access the Voice Control Signal Display:

The *Voice Control Signal Display* is a view-only screen that displays the control signals from the network (i.e., From Framer) and from the bus (i.e., To Framer).

1. From the Quad DS-1 *Utilities Menu*, place your cursor on the *Voice Control Signal Display* field and press **<Enter>**. The following screen appears:

```

Lucent Technologies      DACS II AX - Quad T1      Slot:01      Help = [?]

                                PCM Signalling Display Menu

Port #1      From      To
              Framer    Framer
              Write ----- Read
DS0  BTS      ABCD      ABCD      BTS
=====
 1    42      ABCD      ABCD      43
 2    43      ABCD      ABCD      42<-
 3    **      No Connection      **
 4    **      No Connection      **
 5    **      No Connection      **
 6    **      No Connection      **
 7    **      No Connection      **
 8    **      No Connection      **
 9    **      No Connection      **
10    **      No Connection      **
11    **      No Connection      **
12    **      No Connection      **

                                I/O Address  Data  Trans.  I/O Address  Data  Monitor DS0: 02
F-Framer: 00207141    6f    1  T-Bus: 00204029    1f
T-Framer: 00207121    0f    1  F-Bus: 0020502b    0f

[N]ext port      [C]lear transitions

```

Figure 11-21. Voice Control Signal Display

2. To monitor a DS0, press **<Enter>** until the DS0 you want appears. An arrow will appear next to your selection.
3. To move from Port 1 to Port 2, 3 or 4 press **[N]**. To clear transitions press **[C]**.
4. To return to the *Utilities Menu* press **X**.

Voice Control Signal Field Descriptions

These fields appear on the Voice Control Signal Display (Figure 11-21).

Port #: Displays the port number on the device.

From Framer: Control signals coming from the NI (network).

To Framer: Control signals going towards the NI (network).

Write BTS: (Write Backplane Timeslot).

Read BTS: (Read Backplane Timeslot).

DS0: A timeslot.

ABCD: Control signals.

I/O Address: The NI framer address.

Data: The data received from the NI.

Trans.: The control signal transitions (changes) from the NI.

Monitor DS0: Selecting the DS0 you want to display and monitor.

Commands

[N]ext port: Displays information on the next port.

[C]lear Transitions: Clears the control signal changes counter.

**Procedure - Dump
Connection
Statistics**

To access the Dump Connection Statistics:

The *Dump Connection Statistics* is a view-only screen that displays the number of connections being used by the Quad DS-1 module.

1. From the Quad DS-1 *Utilities Menu*, place your cursor on the *Dump Connection Statistics* field and press **<Enter>**. The following screen appears:

```

Lucent Technologies      DACS II AX - Quad T1      Slot:09      Help = [?]

Display All Connection Statistics...

                                Port 1      Port 2      Port 3      Port 4      Total
Total Signalling TS:      0              0              24              24              48
Total Src Voice TS.:      0              0              24              24              48
Total Dest Voice TS:      0              0              24              24              48
Total Src Data TS...      24             24              0              0              48
Total Dest Data TS.:      24             24              0              0              48

Total Data TS.....:      48
Total Voice TS.....:      48
                        ----
Total TS Used.....:      96

E[x]it

```

Figure 11-22. Dump Connection Statistics Screen

2. To return to the *Utilities Menu* press **X**.

Dump Connection Statistics Field Descriptions

These fields appear on the Dump Connection Statistics screen (Figure 11-22).

Port #: Displays the port number on the device.

Total Signalling TS: The total number of voice connections on the port.

Total Src Voice TS: The total number of source voice connections on the port.

Total Dest Voice TS: The total number of destination voice connections on the port.

Total Data TS: The total number of data connections used on the port.

Total Voice TS: The total number of voice connections used on the port.

Total TS Used: The total number of connections used on all ports.

Procedure - View Trunk Conditioning

To view the Trunk Conditioning:

The *Trunk Conditioning* is a view-only screen that displays the alarm status of the trunk. If the trunk condition status is *ON*, then it is in an alarm condition. If the trunk is in an alarm condition, and the Quad DS-1 is running **data**, a Hex 1A code will be sent to the bus (i.e., the other side of the connection). If the trunk is in an alarm condition, and the Quad DS-1 is running **voice**, an *All Ones* code will be sent to the bus.

1. From the Quad DS-1 *Utilities Menu*, place your cursor on the *Trunk Conditioning* field and press **<Enter>**. The following screen appears:

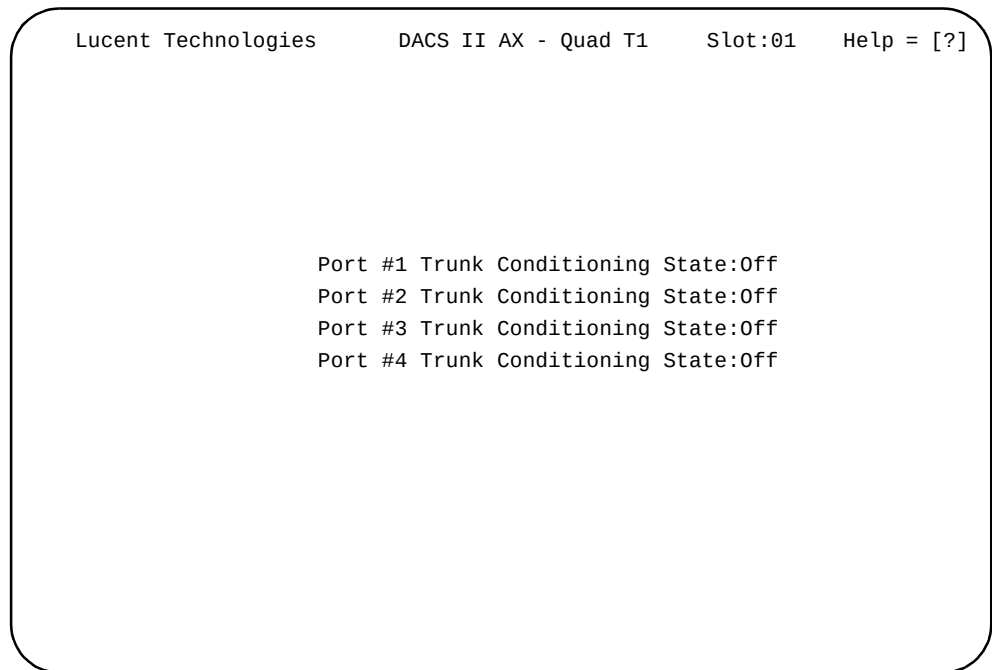


Figure 11-23. Trunk Conditioning

2. To return to the *Utilities Menu* press **X**.
-

Reload and Refresh Connection Map

The *Reload Connection Map Menu* and the *Refresh Connection Map Menu*, Figure 11-24, do not invoke submenus. To re-establish an existing connection, position your cursor on either of the fields, and press **<Enter>**. The action is transparent to the user.

Select *Reload Connection Map* for an application module to request the SMC II to resend a connection map.

Select *Refresh Connection Map* for an application module to refresh its existing connection map.

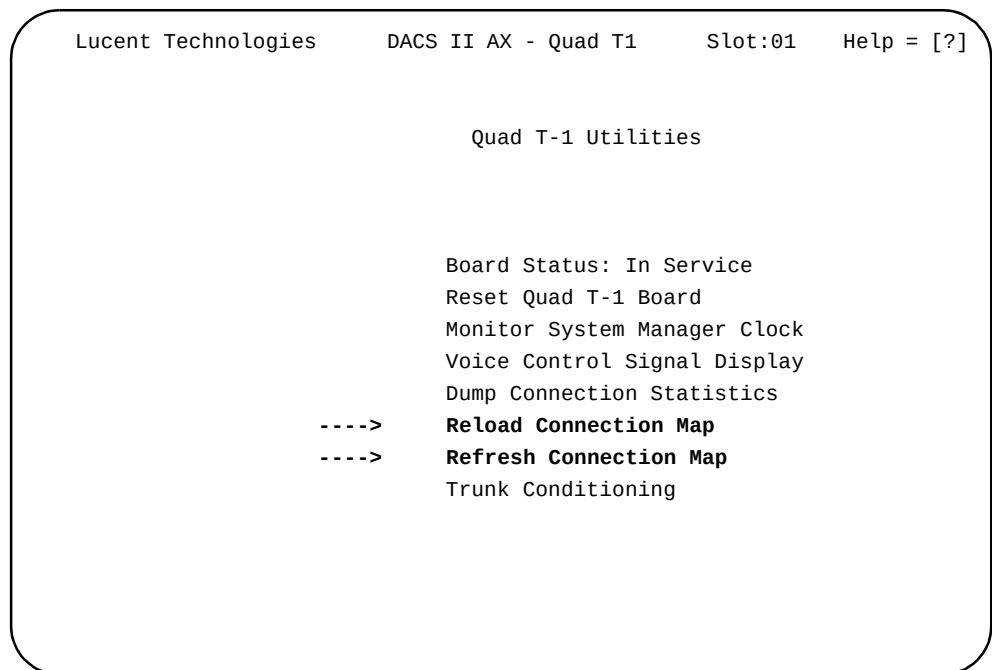


Figure 11-24. Reload and Refresh Connection Map Fields

About Menu

The About menu displays information about the software release and version, and details about the Interface Module.

Procedure - Display Identification Information

To Display Identification Information:

1. From the DS-1 *Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following screen appears:

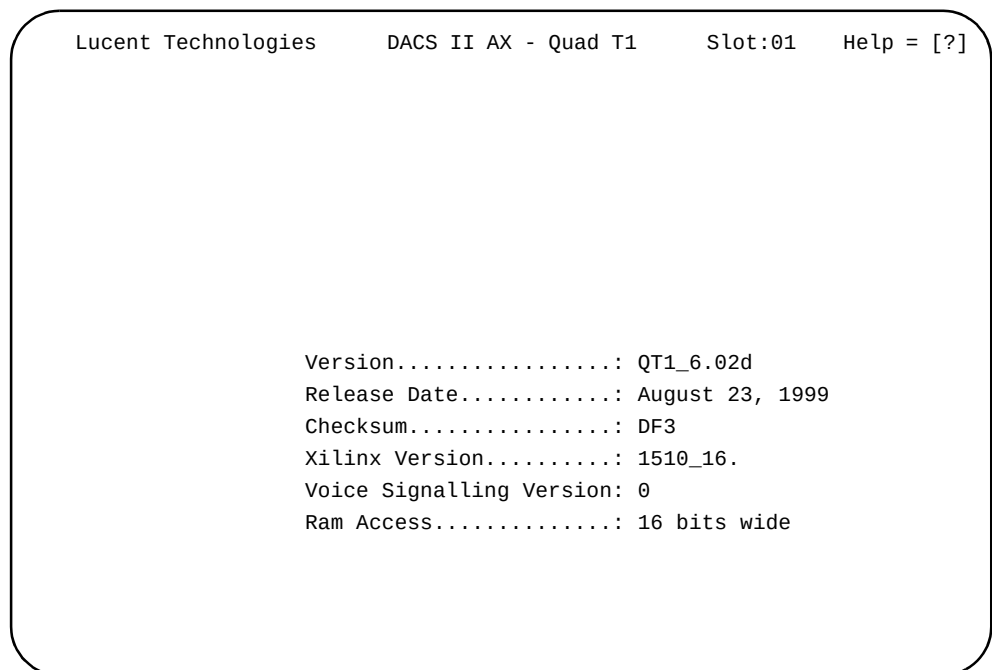


Figure 11-25. Quad DS-1 About Screen

2. Type **X** to return to the previous menu.

About Menu Field Descriptions

These fields appear on the Quad DS-1 About Screen (Figure 11-25).

Version: This is the software version current in the DS-1's flash memory.

Release Date: The software release.

Checksum: The sum of all bytes in the DS-1's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

Voice Signaling Version: The revision level of software used in the commands bits for voice signaling.

Ram Access: The size of the memory bus.

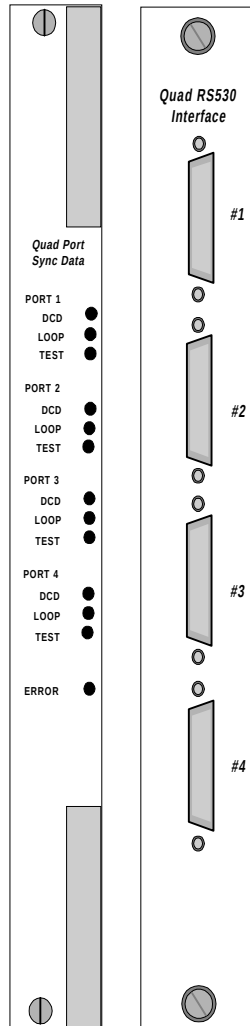
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Physical Description



The Quad High Speed Application/Interface Module Set contains a microprocessor and FLASH memory for program storage. It supports four high-speed synchronous data ports and accommodates synchronous data rates from 48 Kbps to 2.048 Mbps.

Quad Port Sync Data LEDs and an ERROR LED are located on the front bezel of the application module.

- **DCD** - indicates a data carrier detect signal is being sent from the Quad High Speed serial port interface.
- **LOOP** - indicates a loopback condition has occurred on the port.
- **TEST** - indicates a test is being performed on the port.
- **ERROR** - indicates an error condition exists for this application module.

The Quad High Speed Interface Module provides the electrical interface for four high speed ports. The electrical interface for each port can be configured independently for RS-232, V.35 or RS-422 at the system console. Each of the ports has a DB25 female connector to terminate the I/O cable from the attached device. The connectors are wired according to EIA-530 for a DCE device. Cables are available for adaptation from the Quad High Speed rear interface DB25 female connector to RS-232, V.35 or RS-422 connectors as required. Operational mode of the Quad High Speed is fixed as DCE emulation.

Thumb screws are provided at the top and bottom of the bezels to secure the module in the chassis and to make an electrical connection to frame ground for FCC emissions compliance. The electrical connection to frame ground also protects the Quad High Speed interface module from static discharge.

NOTE:
The N + 1 Protection Switch does not supply redundancy for the Quad High Speed module set.

Figure 12-1. Quad High Speed Application/Interface Module Set

Regulatory Information

FCC Information

This equipment complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference. Shielded cables should be used with this unit to ensure compliance with the Class A limits.

This equipment meets the technical criteria specified in the Part 68 rules, sub-part A through F, (for connection of terminal equipment to the telephone network) as well as the requirements specified in AT&T Technical Publications 62411, 54016 and 54019A (ESF).

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) technical publications UL 1950, Third Edition, CAN/CSA-C22.2 No. 950-95, Third Edition, and EN60950:1992.

Type of interface	1.544 Mbps Digital Channel
Facility Interface	04DU9-BN for SuperFrame (SF) D4 AMI format without line power
	04DU9-IKN for ANSI ESF AMI format without line power
Service Code	6.ON. Does not provide billing and encoded analog protection.
	DACS II AX units use an integrated CSU. Affidavit to Telco is required.
Jack Arrangement	RJ48C
Ringer Equivalence	N/A

Regulatory Information (Continued)

FCC User Requirements

This information is provided to ensure that you comply with the Federal Communications Commission (FCC) Rules, Part 68 for the Quad T1 and Octal T1/E1 module sets:

1. All direct connections to the T1 digital lines must be made through standard plugs and jacks furnished by the telephone company. Before connecting your unit, you must do the following:
 - a. Tell your network service provider that you have an FCC registered device that you wish to connect to the company's lines. Provide the fourteen-digit FCC registration number listed on the label. The service provider will also need to know the facility interface code (04DU9-XX) and service code (6.0N) in order to connect the necessary service.
 - b. Inform the service provider that you wish to use the RJ48C (for the Quad T1) or the RJ48M (for the Octal T1/E1) jack arrangement.
 - c. After the service provider has installed the RJ48C or RJ48M jack, you may connect the unit with the appropriate cable.
2. If the unit appears to be malfunctioning, it should be disconnected from the T1 digital line until the source of the problem is confirmed. If the unit needs to be repaired, it should not be reconnected until after the repair is completed.
3. The unit has been designed to prevent harm to the T1 network. If the service provider determines that it is exceeding tolerance parameters, they are permitted to temporarily disconnect service. When possible, the customer will be given advance notice.
4. Under FCC Rules, no customer is authorized to repair the equipment, regardless of its warranty status.
5. If the service provider alters the equipment in a manner that will affect its usage, advance notice must be given to prevent service interruption.

Normally, Lucent Technologies' equipment will be used to interface either FCC registered or grandfathered digital terminal equipment to the digital service channel. If the equipment to be connected is not of this type, institutional procedures provide that an affidavit be supplied to the service provider. This affidavit must state that the system will be operated only by trained individuals and that the signal power at the service provider interface will not exceed the limits set forth in Part 68 of the FCC's Rules and Regulations.

Regulatory Information (Continued)

Industry Canada

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements documents. 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. 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 coordinated by a representative 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 utility, 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.

NOTICE: The **Ringer Equivalence Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. the termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Before You Begin

- This chapter is written for ADMINISTRATOR-level users.
 - A slot must first be configured for the module type and the Quad High Speed module must be resident in a slot in the equipment nest. A Quad High Speed interface module must also be resident in the same numbered slot as the Quad High Speed application module. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4 of this manual.
 - For cabling and interface requirements, see Appendix B.
-

Slot Configuration

Procedure

To configure a slot for the Quad High Speed Module:

1. From the DACS II AX Main Menu, place your cursor on the *System Configuration* field and press **<Enter>**.

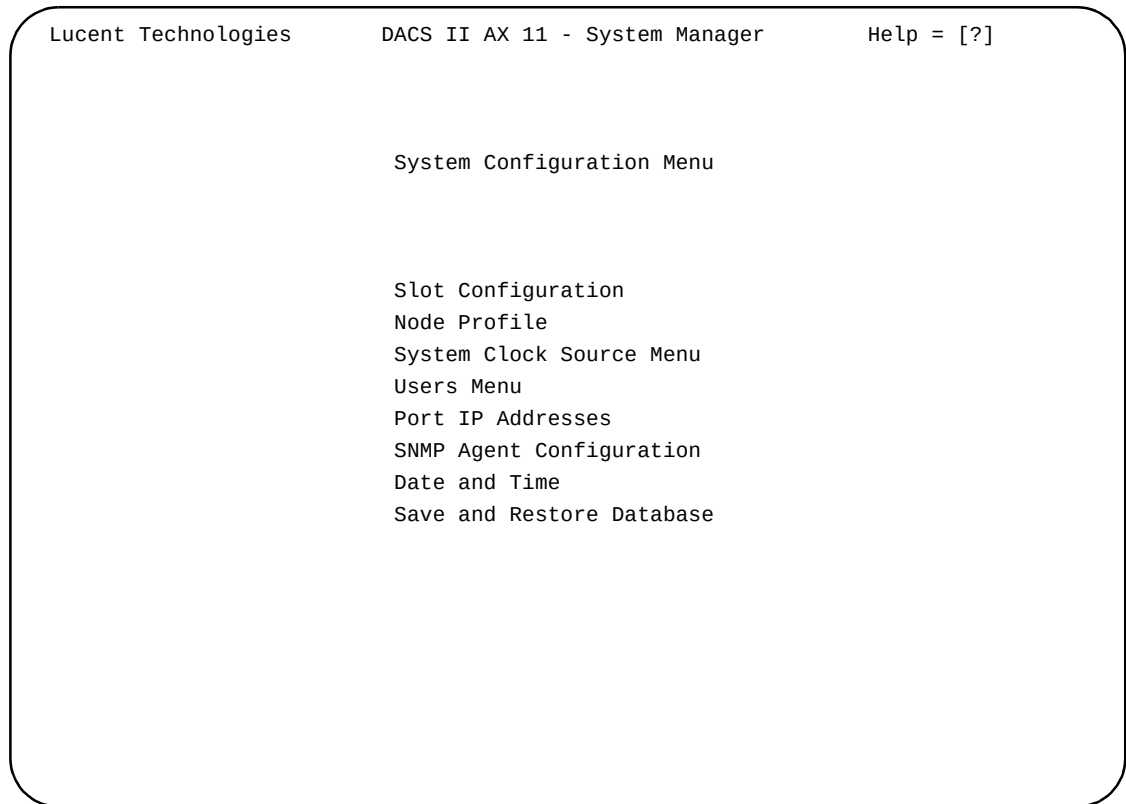


Figure 12-2. System Configuration Menu

2. Press **<Enter>** at the *Slot Configuration* field. The *Slot Configuration* menu appears displaying slots numbered from 1 to 4 (DACS II AX-4) or 1 to 11 (DACS II AX-11).

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1	Redundant	Enable
2	Quad High Speed		BERT test Disable
3	Octal T1/E1	Loop One	Enable
4	Octal T1/E1	Loop Two	Enable
5	Octal T1/E1	Loop Three	Enable
6	Octal T1/E1	Loop Four	Enable
7	Octal T1/E1	Loop Five	Enable
8	Octal T1/E1	D/V Loop 1	Enable
9	Octal T1/E1	D/V Loop 2	Enable
10	T3	Primary Lnk	Enable
11	T3	Secondary	Enable

N+1 Redundancy: Disable
N+1 Redundancy Switchover: Automatic
N+1 Redundancy Restore: Manual

Change Card = [Enter key] [D]elete Card

Figure 12-3. DACS II AX 11 Slot Configuration Menu

3. Place your cursor on the desired slot #, where your Quad High Speed module will reside, and press **<Enter>**. The *Slot Configuration* submenu appears:

The screenshot shows a terminal window titled "DACS II AX 11 - System Manager". The top bar includes "Lucent Technologies" on the left and "Help = [?]" on the right. The main content area displays the "Slot Configuration" submenu. Below the title, the following configuration details are shown: "Slot name: slot 2", "Card type: Quad High Speed", and "Redundancy: Disable".

Figure 12-4. Slot Configuration Submenu

4. At the *Slot Configuration* submenu, place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number and press **<Enter>** again.
5. Next, position your cursor on the *Card Type* field and scroll through the card types by pressing the **<Enter>** key.
6. Press **X** to save your configuration and return to the previous menu.



NOTE:

The same procedure applies when replacing an existing, configured module in a slot with a different, non-configured module.

**Delete Slot
Configuration**

If you opt to delete a card, press **D** and a message appears stating, "All Existing connections for this slot will be deleted." Press Y to confirm the action or N to discontinue.

The *Configured Type* must display Quad High Speed and the *Device State* must display *Online*.

Quad High Speed Main Menu

From the Quad High Speed *Main Menu*, you can configure the module, run diagnostic tests, access utilities, and display module identification.

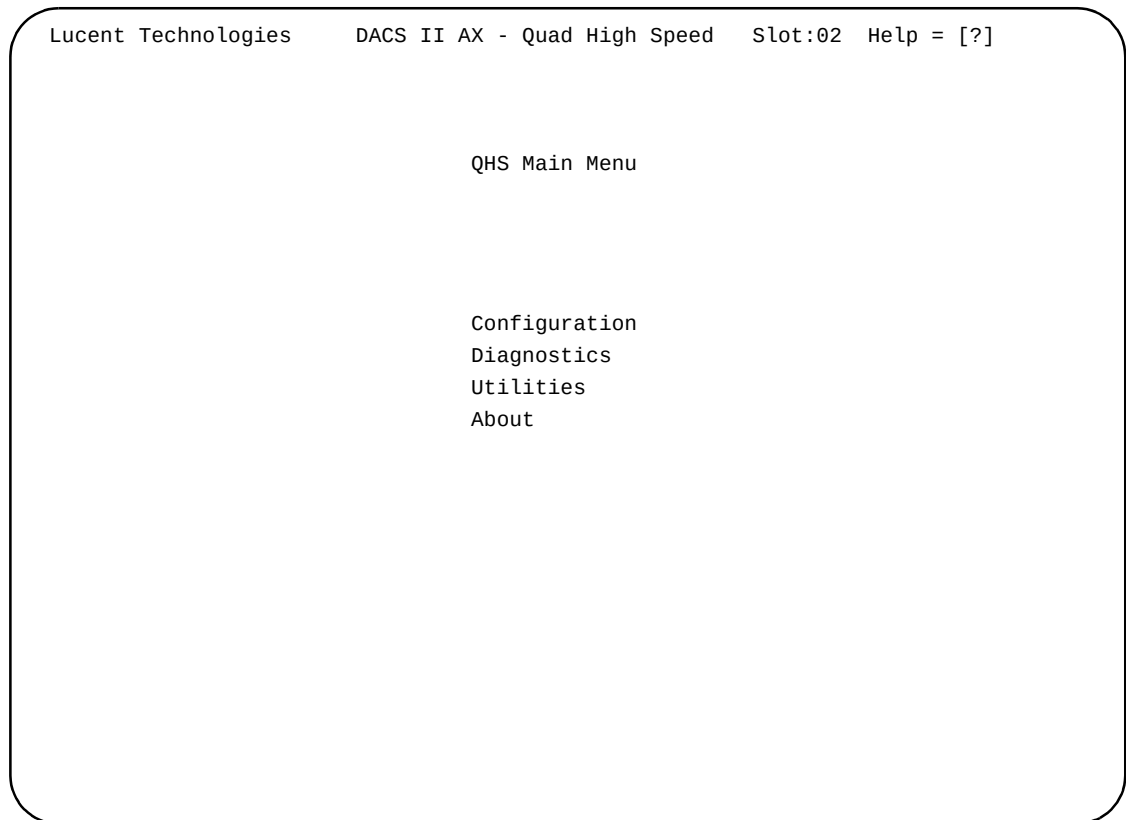


Figure 12-5. Quad High Speed Main Menu

Configuration Menu

The Quad High Speed Configuration Menu provides access to a port configuration submenu. From here, you can configure the ports. When a Quad High Speed card is replaced, the old configuration is preserved.

Configure Ports

To configure the parameters:

1. Place your cursor on the *Configuration* field, and press **<Enter>**. The following menu appears:

```

Lucent Technologies   DACS II AX - Quad High Speed   Slot:02   Help = [?]

                                Configuration Menu

                                Port 1      Port 2      Port 3      Port 4

Name.....:port name      port name      port name      port name
Speed.....:0              0              0              0
Timing.....:Internal      Internal      Internal      Internal
DCD out.....:Forced On    Forced On    Forced On    Forced On
DSR out.....:Forced On    Forced On    Forced On    Forced On
Data.....:Normal          Normal      Normal      Normal
Clock.....:Normal          Normal      Normal      Normal
Interface....:V.35         V.35       V.35       V.35
V.54 loop....:Disabled     Disabled    Disabled    Disabled
Connect Event:Disabled     Disabled    Disabled    Disabled
Port Status...:In Service  In Service  In Service  In Service

Cascade Leds when Idle: Yes
  
```

Figure 12-6. Quad High Speed Configuration Menu

2. To change the configuration of a particular port, move your cursor to the field to be configured and press **<Enter>** to toggle between the field's options.

3. Press **X** to save changes. The following screen appears:

```

Lucent Technologies   DACS II AX - Quad High Speed   Slot:02   Help = [?]

                        Configuration Menu

                Port 1                Port 2                Port 3                Port 4

Name.....:port na ***** port name
Speed.....:0 * * * * * 0
Timing.....:Interna * * * * * Internal
DCD out.....:Forced * * * * * Forced Off
DSR out.....:Forced * * * * * Forced On
Data.....:Normal * * * * * Normal
Clock.....:Normal * * * * * Normal
Interface....:V.35 * * * * * V.35
V.54 loop....:Disable * * * * * Disabled
Connect Event:Disable * * * * * Disabled
Port Status...:In Serv ***** In Service

Cascade Leds when Idle: Yes
  
```

Figure 12-7. Update Configuration Screen

4. Press **Y** to save your changes or press **N** to cancel changes. Either selection returns you to the *Quad High Speed Main Menu*.

Cascade LEDs

To configure the LEDS Status:

1. From the Quad High Speed *Port Configuration Menu*, place your cursor on the *Cascade Leds when Idle* field.
 2. Press **<Enter>** to toggle between options, *Yes* or *No*.
 3. To cascade LEDs, select **Yes**. Press **X** and the message "Update Configuration? Are you sure (Y/N)?" appears. Press **Y**(es) to save configuration and *cascade LEDs* or press **N**(o) to cancel configuration and return to the Quad High Speed *Main Menu*.
 4. To stop cascade, select **No**. Press **X** and the message "Update Configuration? Are you sure (Y/N)?" appears. Press **Y**(es) to save configuration and *stop LED cascade* or press **N**(o) to cancel configuration and return to the Quad High Speed *Main Menu*.
-

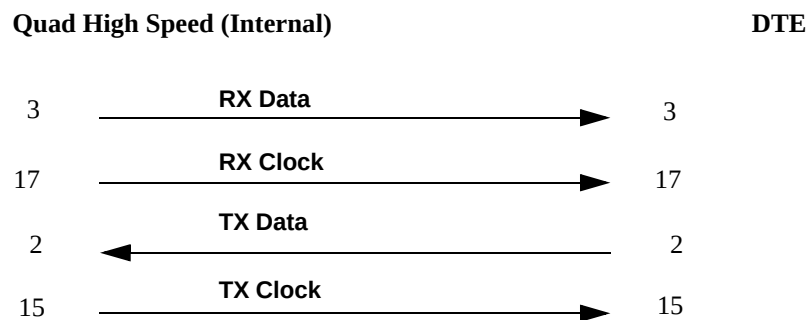
Configuration Field Descriptions

Name: (*text field*) This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Quad High Speed module. Some users find it beneficial to use circuit numbers to name the ports.

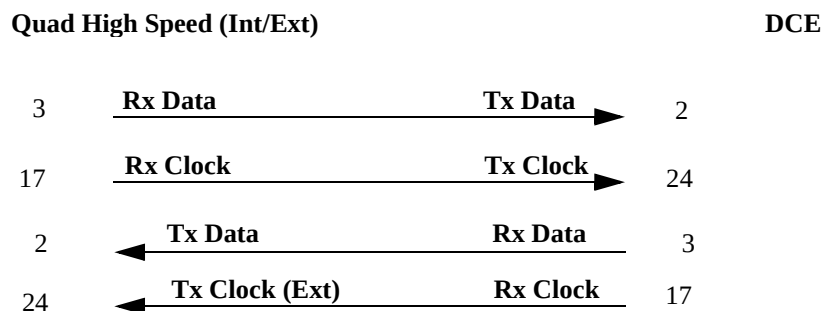
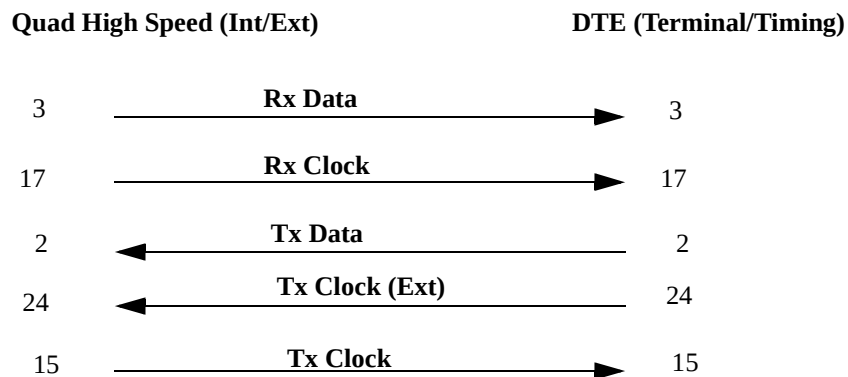
Speed: The Quad High Speed module operates at speeds from 48 Kbps to 2.048 Mbps (Nx56/64 Kbps).

Timing: (*option field*) The timing options are *Internal*, *Int/Ext*, or *External*. Internal is the normal setting and should always be chosen unless there is a specific reason to do otherwise. The Quad High Speed module will provide both TX clock and RX clock to the DTE.

⇒ **NOTE:**
RS-232 pin numbers are used for reference.



Int/Ext is recommended if the attached user DTE cable exceeds 10 feet in length and the customer data rate exceeds 224 Kbps. This setting may require a special DTE configuration or a modified cable.

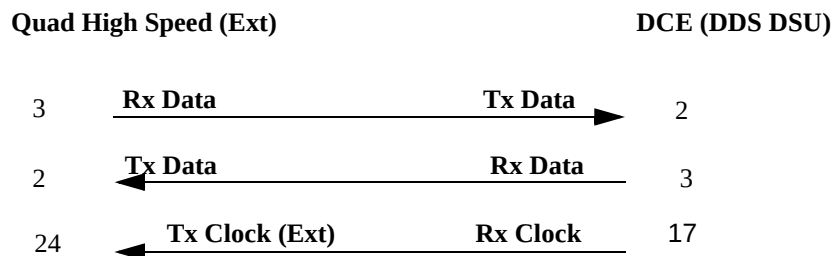


Int/Ext should be used if the attached equipment is DCE. The remote DCE must be loop timed to achieve the required timing lock with the DACS II AX system clock.

⇒ NOTE:
When a Quad High Speed port is connected to a DCE a crossover needs to be used.

External should be used if the attached equipment is DCE that does not accept a clock such as a Digital Data System (DDS) DSU. The DSU and the DACS II AX system must be locked to the same timing source (usually network clock).

The DSU can provide timing to the DACS II AX system when it is attached to port 1 and the port is configured as source clock.



DCD Out: (*option field*) Quad High Speed presents a DCE interface to the attached customer equipment. **Data Carrier Detect** can be *Forced On*, *Tracks RTS*, or *Forced Off*. Forced On is normally on and turns off upon network carrier failure.

DSR Out: (*option field*) **Data Set Ready** can be *Forced On*, *Tracks DTR* or *Forced Off*.

Data: (*option field*) The options are *Normal* or *Inverted*.

Clock: (*option field*) Initially choose *Normal*. If frequent errors occur at the port, try *Inverted* and check performance.

Normally, the down-going clock edge is in the middle of each bit. On lengthy cables when a clock is sent from one device to clock data from the other device, the data arrives skewed from the originating clock due to the round trip cable delay. When the delay is such that the originating clock down-going edge is on the edge of the bit returned, "Inv" will correct this condition inside the Quad High Speed module.

Interface: (*option field*) The interface options are *V.35*, *RS530/422* and *RS232*.

V.54 Loop: (*option field*) When enabled, this port will respond to receipt of a remote digital loop command arriving from the port of the mated Quad High Speed module. When disabled, it will not respond to a remote digital loop command.

Connect event: (*option field*) Enables or disables the connection or disconnection of a port to be recorded in the System Event menu.

Port status: (*option field*) This field displays the status of the port. The status will either be *In Service* or *Out of Service*. If the port is out of service it can still run data; only the diagnostics will be affected.

Cascade Leds when Idle: (*option field*) Cascade LEDs is a state in which the inactive front panel LEDs (except for the ERROR LED) flash in a sequential manner. This feature indicates the card is powered up and functioning properly. Any state that can activate a LED (e.g., port in loop, port in test or DCD on) will cancel cascading. Disable this feature to deactivate the front panel LEDs.

Diagnostics Menu

From this menu, you can view and perform diagnostics on the Quad High Speed ports.

Display Diagnostics

To view Diagnostics:

1. From the Quad High Speed Main Menu, place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies   DACS II AX - Quad High Speed   Slot:02   Help = [?]

                                Diagnostic Menu
Name.....: X                port name      port name      port name

Status.....: In Service      In Service      In Service      In Service
Local Loop....: Off          Off          Off          Off
Remote Loop....: Off          Off          Off          Off

BERT.....: Off              Off          Off          Off
Seconds in test: 0           0            0            0
Local Errors...: 0           0            0            0
Remote Errors...: 0          0            0            0

                                Indicators:
                                -----
TX/RX Data.....: Off/Off      Off/Off      Off/Off      Off/Off
RTS/DCD.....: Off/On         Off/On       Off/On       Off/On
DTR/DSR.....: Off/On         Off/On       Off/On       Off/On
Trunk Cond.->NI: On          On           On           On

[R]eset counts      Insert [e]rrors
  
```

Figure 12-8. Quad High Speed Diagnostic Menu

Local Loop

To configure the Local Loop:

1. Position the cursor on the *Local Loop* field, press **<Enter>**. The following menu appears:

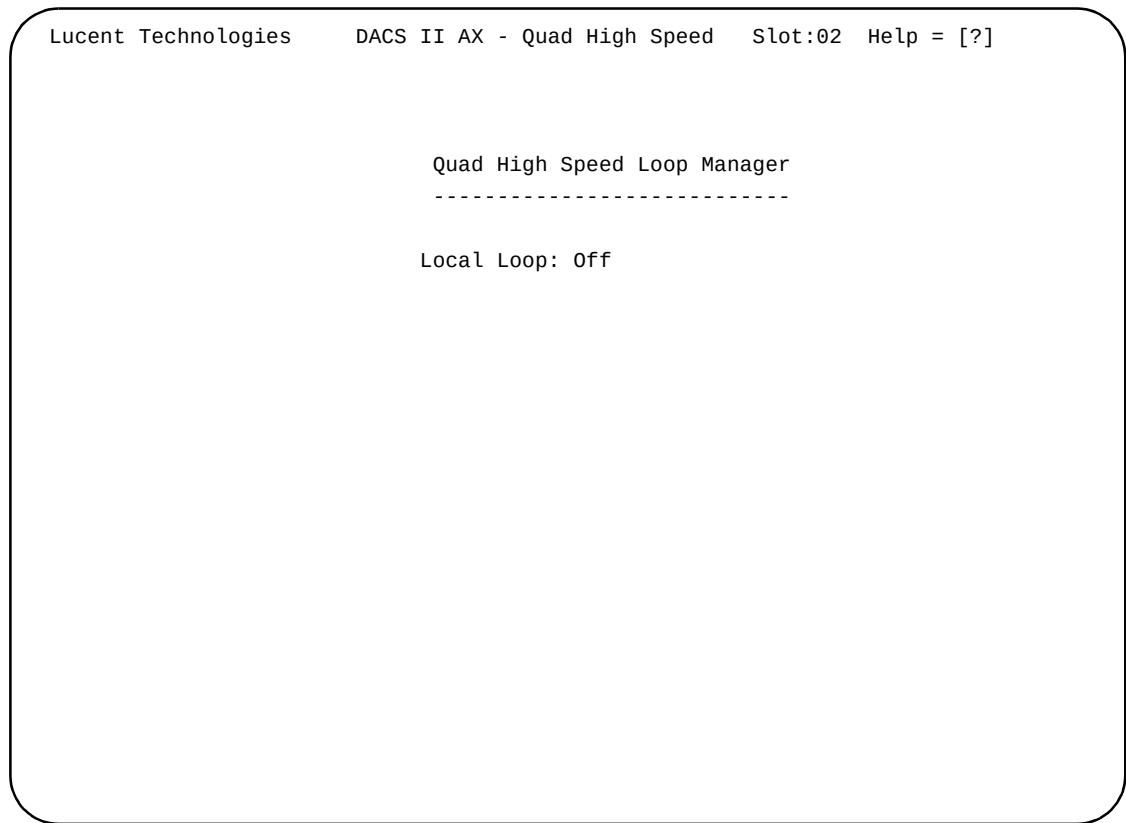


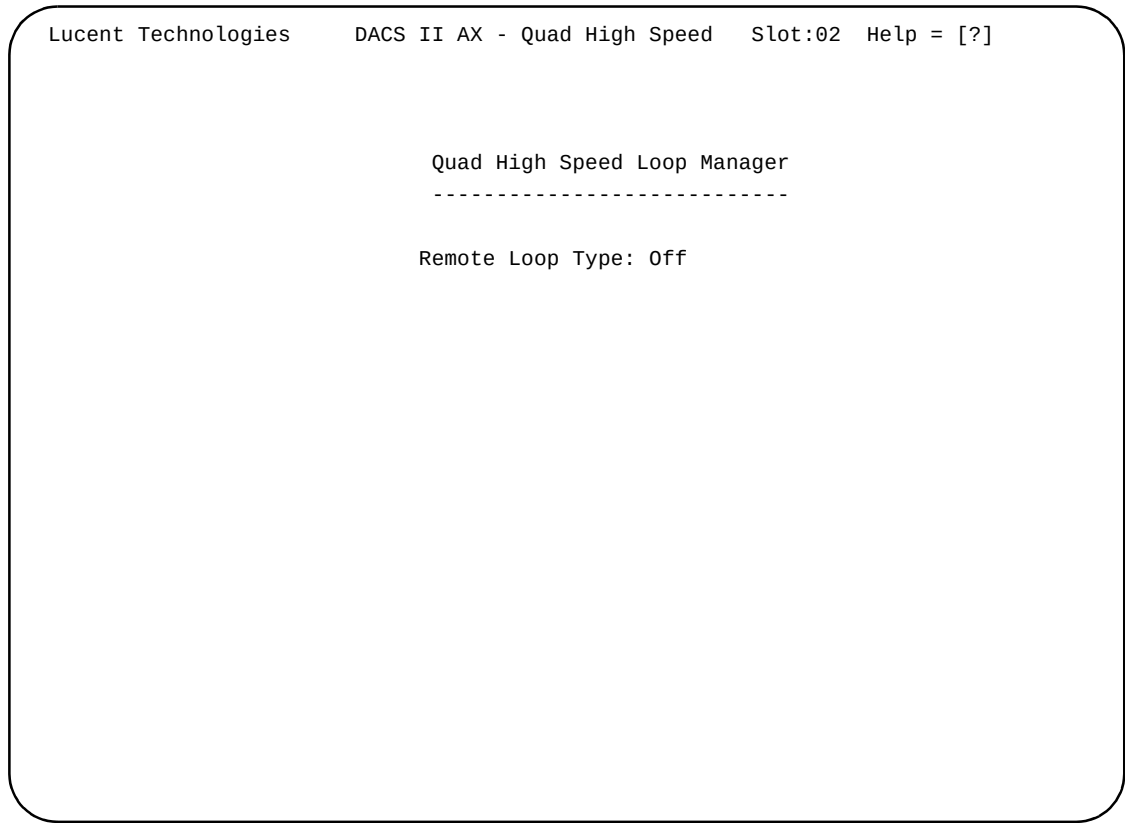
Figure 12-9. Quad High Speed Loop Manager

2. With the cursor on the *Local Loop:* field, press **<Enter>** to toggle between options *Yes* and *No*.
3. Press **X** and the message "Turn ON Local Loop? Are you sure (Y/N)?" appears. Press **Y** to enable loop or press **N** to return to the *Diagnostic Menu*.

Remote Loop

To configure the Remote Loop:

1. From the *Diagnostic Menu*, place your cursor on the *Remote Loop* field and press **<Enter>**. The following menu appears:



The screenshot shows a terminal window with a title bar containing "Lucent Technologies", "DACS II AX - Quad High Speed", "Slot:02", and "Help = [?]". The main content area displays the "Quad High Speed Loop Manager" menu, which consists of a dashed line separator followed by the text "Remote Loop Type: Off".

```
Lucent Technologies   DACS II AX - Quad High Speed   Slot:02   Help = [?]  
  
                        Quad High Speed Loop Manager  
                        -----  
  
                    Remote Loop Type: Off
```

Figure 12-10. Quad High Speed Loop Manager

2. Position the cursor on the *Remote Loop Type:* field, and press **<Enter>** to toggle between options *Off* and *Remote (V54)*.
3. Press **X** and the message "Send Remote Loop? Are you sure (Y/N)?" appears. Press **Y** to *enable remote loop* or press **N** to return to the *Diagnostic Menu*.

Perform BERT Test To perform a Bit Error Rate Test (BERT):

1. From the *Diagnostic Menu*, place your cursor on the *BERT* field and press **<Enter>**. The following menu appears:

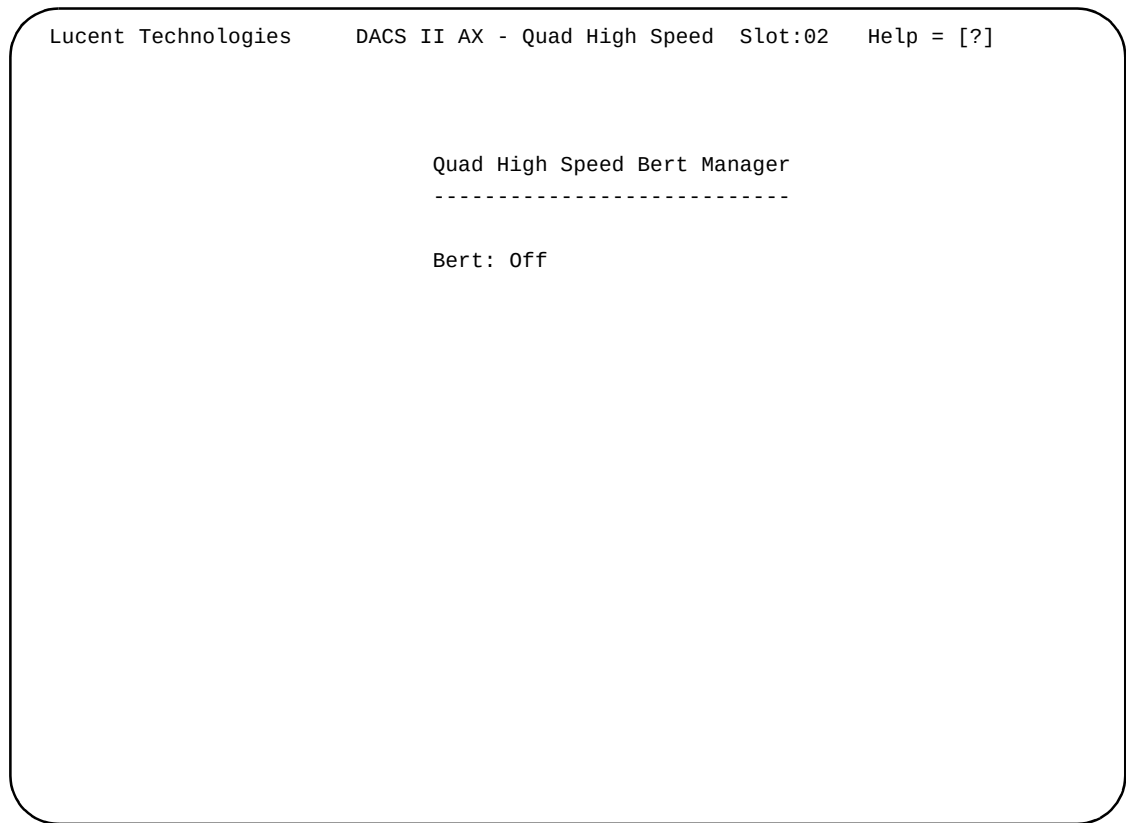


Figure 12-11. Quad High Speed Bert Manager

2. Position the cursor on the *Bert:* field, and press **<Enter>** to toggle between the following options: *Off*, *2047*, *All ones* and *All zeroes*.
3. Press **X** and the message "Send (the option you choose i.e., 2047). Are you sure (Y/N)?" appears. Press **Y** to start a test or press **N** to return to the *Diagnostic Menu*.

Stop BERT Test

To stop a Bert Test:

1. From the *Diagnostic Menu*, place your cursor on the *BERT* field and press **<Enter>**.
 2. From the Quad High Speed Bert Manager, position the cursor on the *Bert:* field, and press **<Enter>** until *Off* appears.
 3. Press **X**. The message "Turn OFF Bert? Are you sure (Y/N)?" appears.
 4. Press **Y** to end test.
-

Diagnostics Field Descriptions

Controls

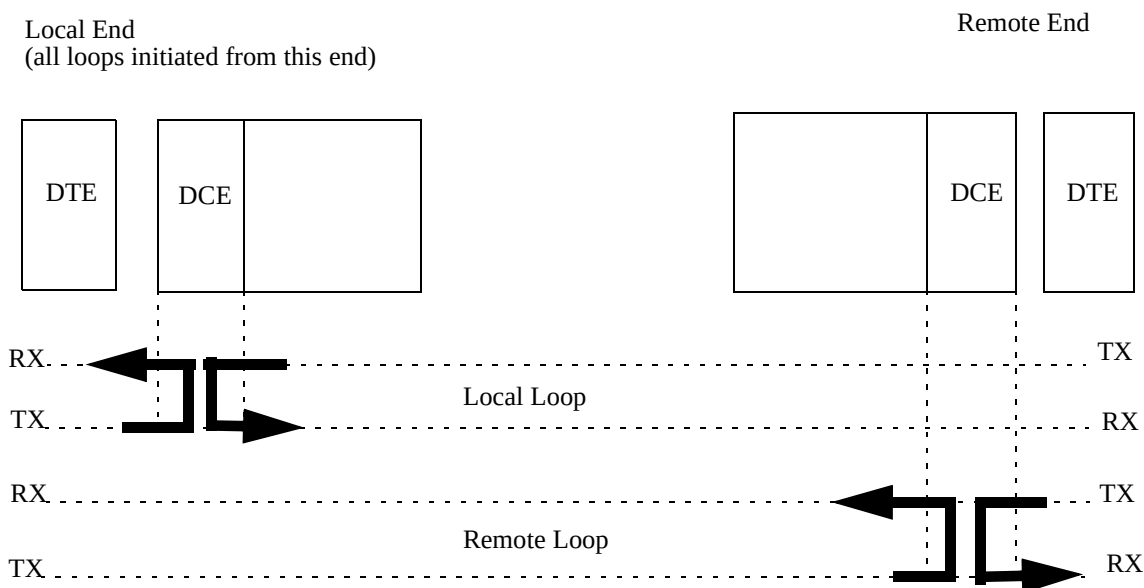
Name: This read-only field displays the name of each port on the Quad High Speed.

Status: This field displays the status of the port. The status will either be *In Service* or *Out of Service*.

Local Loop: When set to *ON*, this parameter causes a bi-directional local loop at the High Speed Data Module where the command was entered. If you turn the *local loop ON*, the front panel "*LOOP*" LED will illuminate and local testing can be performed by external DTE equipment or by the DACS II AX's internal BERT. Only data is looped back. Clocks and control signals are not looped back.

Remote Loop (V.54): Remote Loop causes a remote line loop at the distant end of a point-to-point circuit.

The following diagram illustrates local and remote loops.



BERT: This is useful for testing errors on the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.



NOTE:

The remote loop and data test patterns depend on interface clocks to operate. If Int/Ext or External timing options are selected, ensure the External Clock is present and locked to the DACS II AX system clock.

Seconds in Test: This read-only count represents the number of seconds the Quad High Speed module was in test.

Local Errors: This read-only count represents the number of local errored seconds that occurred in a one second period while the Quad High Speed module was in test.

Remote Errors: This read-only count represents the number of remote errored seconds that occurred in a one second period while the Quad High Speed module was in test.

Indicators

TX/RX Data: If this indicator is ON, the Quad High Speed module is transmitting/receiving data over its serial port interface.

RTS/DCD: If RTS is ON, the Quad High Speed module is receiving a "Request-to-Send" signal over its serial port interface. If DCD is ON, the Quad High Speed module is sending a "Data Carrier Detect" signal over its serial port interface.

DTR/DSR: If DTR is ON, the Quad High Speed module is receiving a "Data Terminal Ready" signal over its serial port interface. If DSR is ON, the Quad High Speed module is sending a "Data Set Ready" signal over its serial port interface.

Commands

[R]eset counts: Clears all counters.

Insert [e]rrors: For test purposes, insert BERT errors.

Utilities Menu

**WARNING:**

The fields shown in this menu should not be accessed or configured unless you are established as a high level user; they are only for debugging purposes. It is strongly suggested that you do not use Utilities unless prompted to do so by a Lucent Technologies technical support representative.

Access Utilities

To access the Utilities:

1. From the Quad High Speed Main Menu, place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

```
Lucent Technologies   DACS II AX - Quad High Speed   Slot:02   Help = [?]  
  
Quad High Speed Utilities  
  
Board Status: In Service  
Reset Quad High Speed Board  
Monitor System Manager Clock
```

Figure 12-12. Utilities Menu

Set Board Status

To set the Board Status:

The *Board Status* screen allows the *Administrator* to put a port *In Service* or *Out Of Service*.

1. Place your cursor on the *Board Status: In Service* field, press **<Enter>**.
The following screen appears:

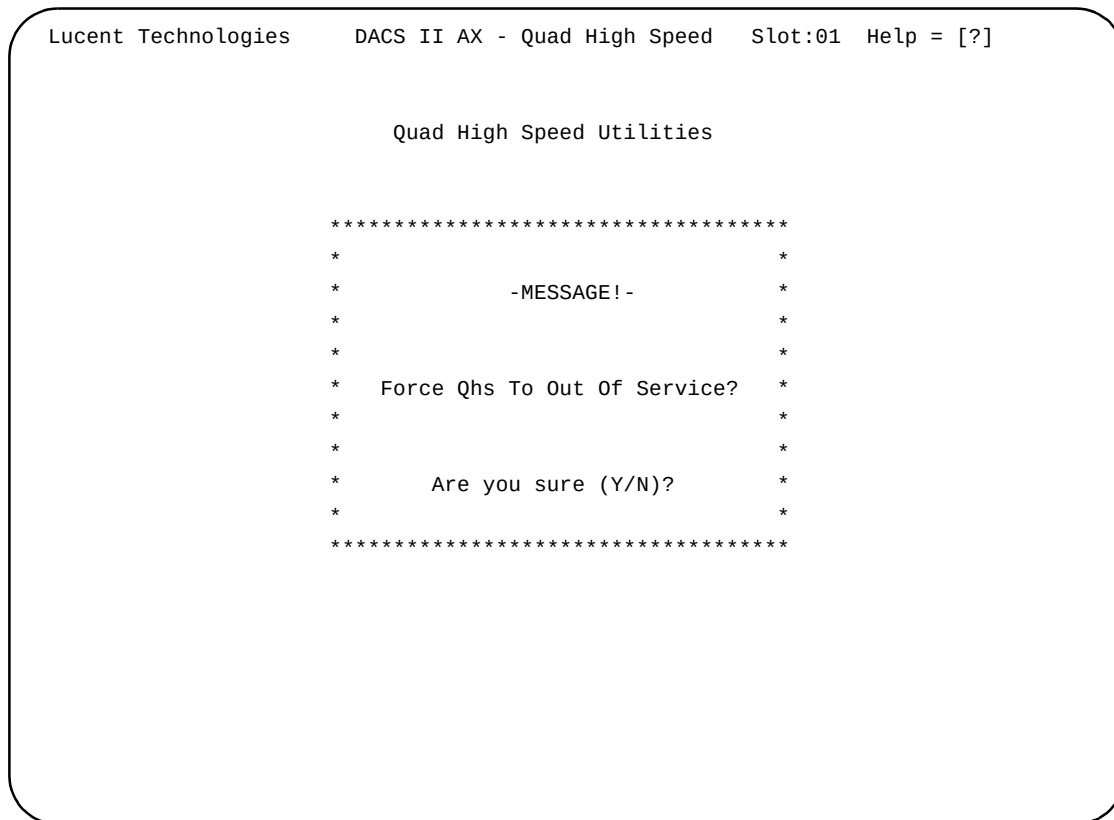


Figure 12-13. Out of Service Board Status Screen

2. Press **Y** to force Quad High Speed *Out of Service* or press **N** to return to the *Utilities Menu*.

**NOTE:**

The ERROR LED turns red when the Quad High Speed module is set to Out of Service.

**Change Board
Status In Service**

To change the Board Status to In Service:

1. From the Quad High Speed *Utilities Menu*, select the *Board Status - Out of Service* field and press **<Enter>**. The following screen appears:

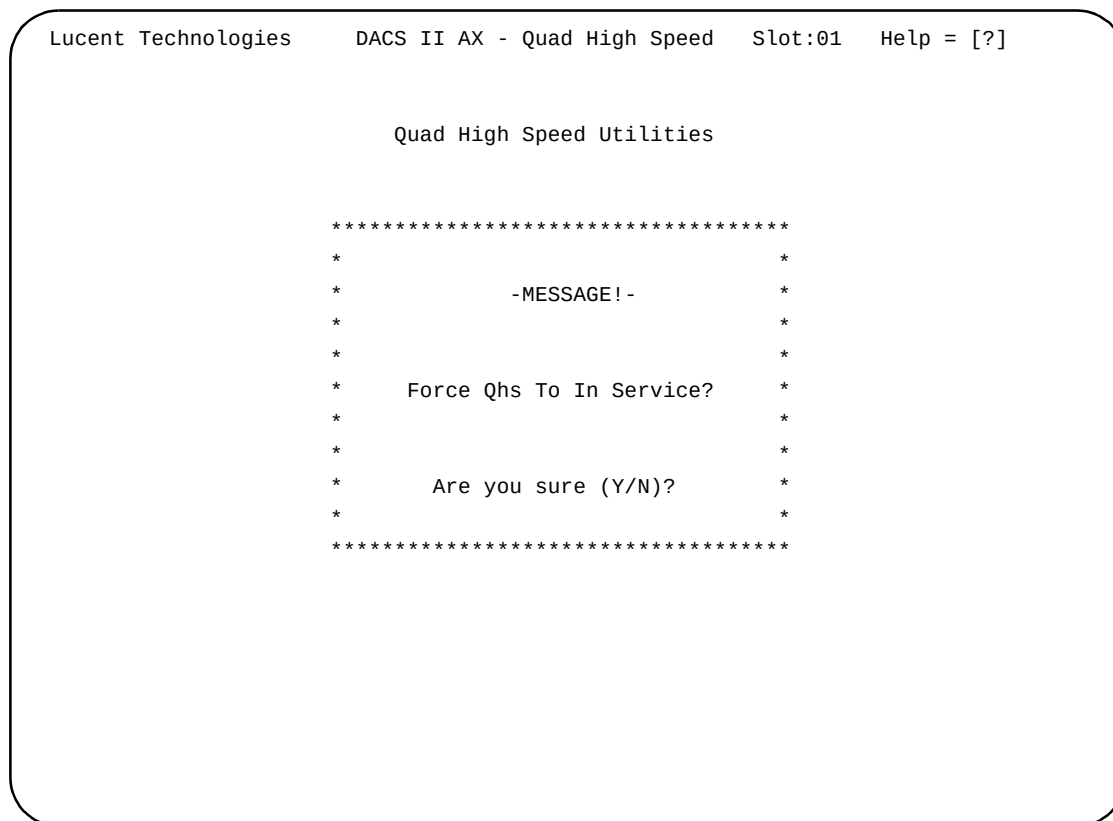


Figure 12-14. Change Board Status Screen

2. Press **Y** to reset Board Status to In Service. The message "Reset this Quad High Speed Board? Are you sure (Y/N)?" appears. Press **Y** and the message "Alert! Please wait while we establish communications with the system manager! Press any key to continue." appears. After pressing any key, press **N** to leave the Board Status as Out of Service.

**NOTE:**

It can take up to 20 seconds for the Board Status to change to In Service. When the status changes to In Service, the red ERROR LED goes out and the Node Summary Menu appears.

**Rest Quad High
Speed Board**

To reset the Quad High Speed Board:

This utility causes the card to initialize. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC, connections will be restored.

1. From the Quad High Speed *Utilities Menu*, place your cursor on the *Reset Quad High Speed Board* field and press **<Enter>**. The following screen appears:

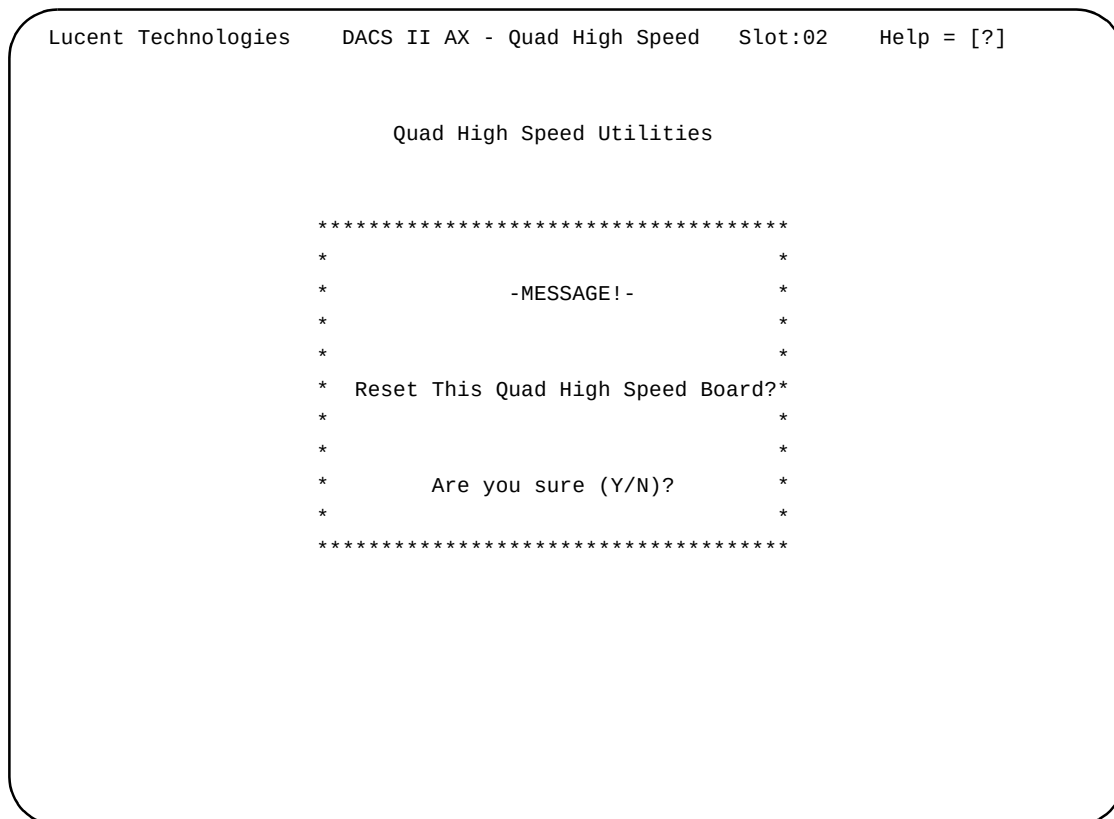


Figure 12-15. Reset Quad High Speed Board Screen

2. Press **Y** to reset device. The message "Alert! Please wait while we establish communications with the system manager! Press any key to continue." appears. Press **N** to return to the *Utilities Menu*.

**Monitor System
Manager Clock**

To access the Monitor System Manager Clock:

The *Monitor System Manager Clock* is a view-only screen that displays the status of vital system timing and displays the backplane integrity of all slots to indicate if the card is on the bus.

1. From the Quad High Speed *Utilities Menu*, place your cursor on the *Monitor System Manager Clock* field and press **<Enter>**. The following screen appears:

```

Lucent Technologies   DACS II AX - Quad High Speed   Slot:02   Help = [?]

                                Monitor Backplane Integrity

Slot #      Slot #      Slot #      Pattern      Patt.      Status
-----      Address      Received      Address      Rcv      (Ignore for QHS)
Slot #1      0x00205007      01      0x00205008      09      ... OK ...
Slot #2      0x00205009      02      0x0020500a      08      ... OK ...
Slot #3      0x0020500b      0b      0x0020500c      0b
Slot #4      0x0020500d      04      0x0020500e      07      ... OK ...
Slot #5      0x0020500f      05      0x00205010      04      ... OK ...
Slot #6      0x00205011      07      0x00205012      07
Slot #7      0x00205013      07      0x00205014      07      ... OK ...
Slot #8      0x00205015      07      0x00205016      07
Slot #9      0x00205017      07      0x00205018      07
Slot #10     0x00205019      07      0x0020501a      07
Slot #11     0x0020501b      07      0x0020501c      07

System Clock Count.: 0
Frame Sync Count...: 0

[C]lear clock counters

```

Figure 12-16. Monitor Backplane Integrity Screen

2. To clear the clock counters press **C**.
3. To return to the *Utilities Menu* press **X**.

About Menu

The About menu displays information about the software release and version, and details about the Interface Module.

Display Identification Information

To display Identification Information:

1. From the Quad High Speed Main Menu, place your cursor on the *About* field and press **<Enter>**. The following screen appears:

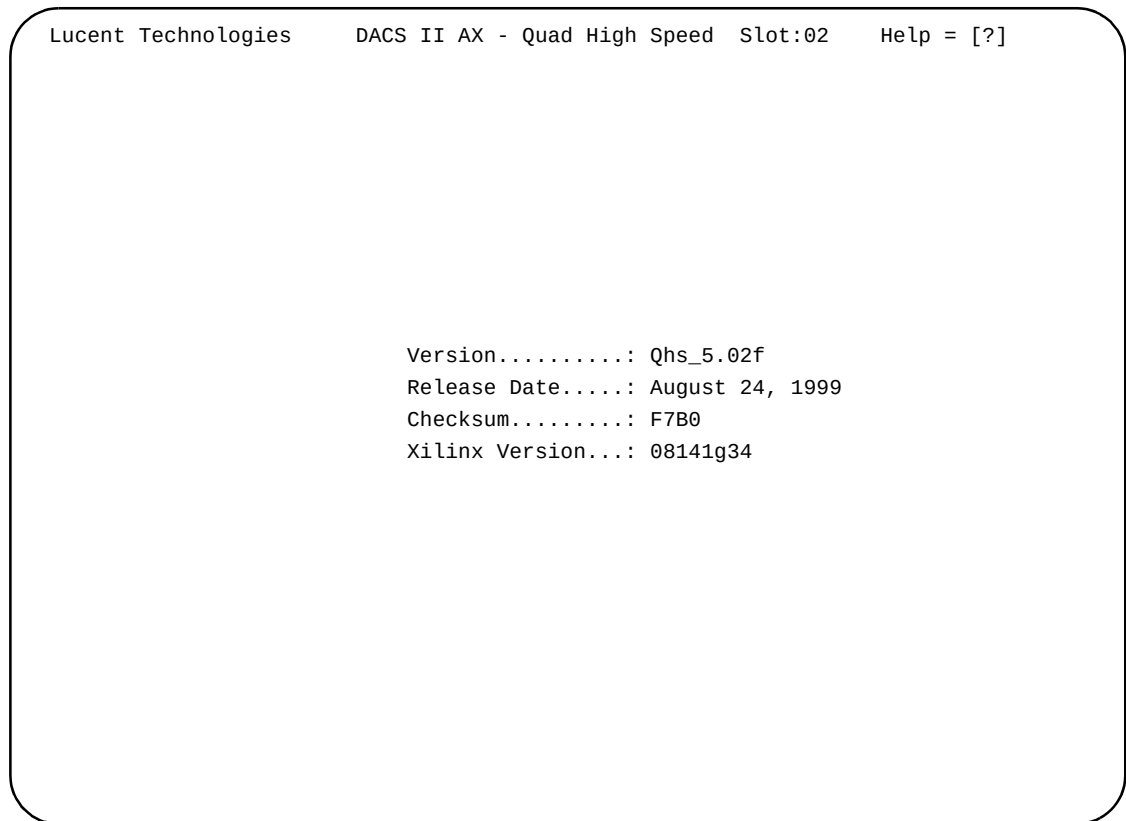


Figure 12-17. Quad High Speed About Screen

About Field Descriptions

Version: This is the software version current in the Quad High Speed's flash memory.

Release Date: The engineering release.

Checksum: The sum of all bytes in the Quad High Speed's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

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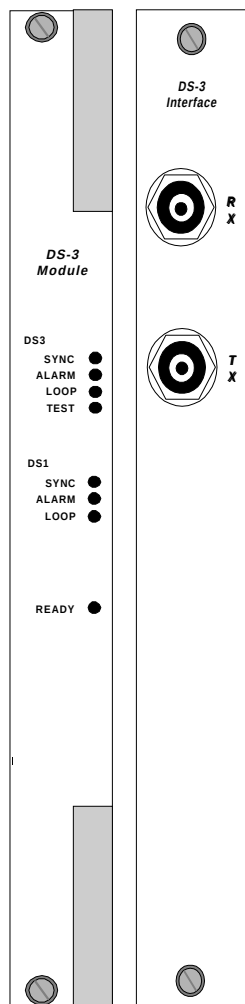
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Physical Description



The DS-3 module set allows the DACS II AX to connect to a DS-3 compatible link. It contains 28 T1 links, a microprocessor, and FLASH memory for program storage. The DS-3 module assembly occupies a single backplane slot in the DACS II AX chassis.

A maximum of six DS-3 module sets may be installed in the DACS II AX-11, based upon mapping 28 links per card for a total of 168 DS1s. In fact, more than six module sets may be installed, although not all associated DS0s can be mapped due to insufficient backplane bandwidth.

The module set assembly comprises two circuit card modules: a DS-3 Application Module that contains backplane, switching, and framing logic, and an Interface Module which provides electrical interface connections.

There are two groups of LEDs on the front card, one group for the DS-3 port and one group for the DS1 port, and a READY LED.

- **SYNC** - green indicates proper functioning for the DS-3 module.
- **ALARM** - red indicates an alarm condition has occurred on the trunk.
- **LOOP** - yellow indicates a loopback condition is enabled.
- **TEST** - green indicates no errors have been detected in a test performed on the trunk. Off indicates that an error has been detected within a test.
- **READY** - solid green indicates the module is in an on-line state, while flashing green indicates the module is configured as a member of an N+1 Redundancy Group. Off indicates a bus error or off-line state.

If all LEDs flash simultaneously, this indicates the module has been forced out of service or no rear card is present.

Thumb screws are provided at the top and bottom of the bezels to secure the modules in the chassis and to make an electrical connection to frame ground for FCC emission compliance. The electrical connection to frame ground also protects the modules from static discharge.

➡ **NOTE:**
N+1 Redundancy for this module is available when it is utilized in a DACS II AX-11 chassis configured with the N+1 Protection Switch.

Figure 13-1. DS-3 Application/Interface Module Set

Regulatory Information

North America

The DS-3 Module complies with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the rear card must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Product Safety

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Europe

This equipment has been designed to be in conformity with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

following the provisions of the EMC directive 89/336/EEC, the Low voltage directive 73/23/EEC, and the TTE directive 91/263/EEC.

Before You Begin

- This chapter is for ADMINISTRATOR-level users.
 - In order to view the menus associated with the DS-3 Module, a slot must be configured for the module type and the DS-3 Module must be resident in a slot in the equipment chassis. A DS-3 Interface Module must also be resident in the same numbered slot as the DS-3 Application Module. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4.
 - Screens are shown for a DACS II AX with the SMC II module. Although the DS-3 Module is also supported by SMC I, there will be some screen differences, mainly involving the Slot Configuration Menu, Slot Configuration Submenu, and Node Summary Menu, as well as anything to do with N+1 Redundancy.
 - For cabling and interface requirements, see Appendix B.
 - DACS II AX T3, as displayed throughout this text, is the same as DACS II AX DS-3.
-

Slot Configuration

Procedure

To configure a slot for the DS-3 Module:

1. From the *DACS II AX Main Menu*, move your cursor to the *System Configuration* field and press **<Enter>**. The following menu appears:

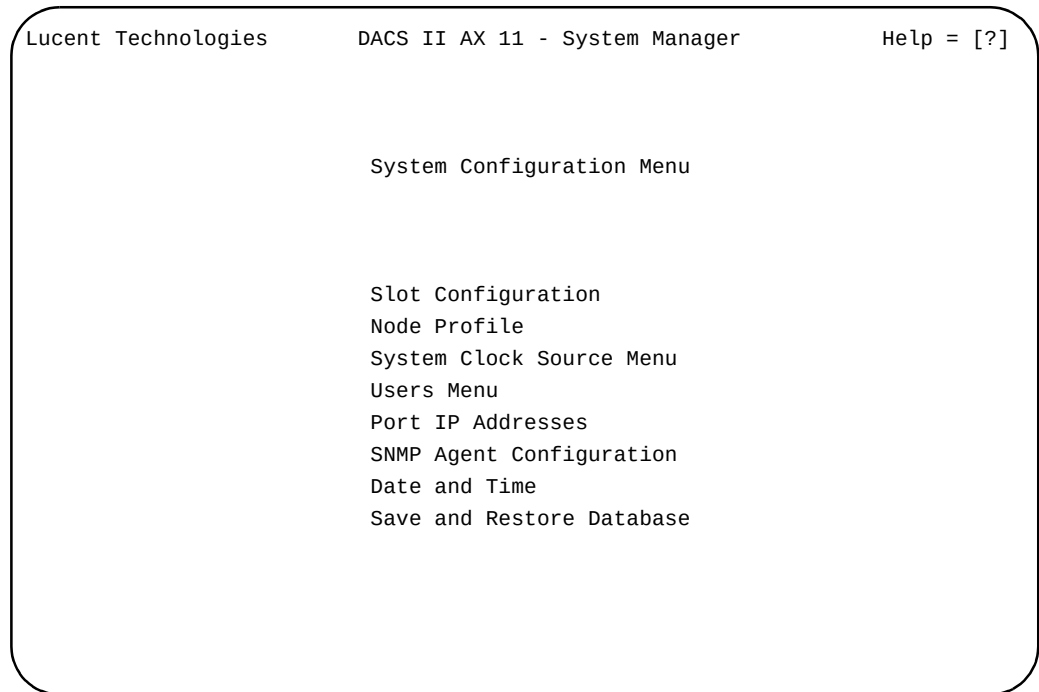


Figure 13-2. System Configuration Menu

2. Then place your cursor on the *Slot Configuration* field and press **<Enter>**. The following menu appears, displaying slots numbered from 1 to 4 (DACS II AX-4) or from 1 to 11 (DACS II AX-11):

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1	Standby Lnk	Enable
2	Octal T1/E1	Data Loop 1	Enable
3	Octal T1/E1	Data Loop 2	Enable
4	Octal T1/E1	Data Loop 3	Enable
5	Octal T1/E1	Data Loop 4	Enable
6	Octal T1/E1	Data Loop 5	Enable
7	Quad T1	T1	Disable
8	Quad OCU	OCU	Disable
9	Router	Router	Disable
10	T3	T3 Link	Enable
11	T3	T3 Standby	Enable

N+1 Redundancy: Enable
N+1 Redundancy Switchover: Automatic
N+1 Redundancy Restore: Manual

Change Card = [Enter key] [D]elete Card

Figure 13-3. Slot Configuration Menu

The N+1 Redundancy fields in the Slot Configuration Menu (Figure 13-3) are not displayed for the DACS II AX-4.

3. Move your cursor to the slot number where the DS-3 module will reside, and press **<Enter>**. The following menu appears:

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration

Slot name: Primary Lk
Card type: T3
Redundancy: Enable

Figure 13-4. Slot Configuration Submenu

4. Place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number of up to 11 characters and press **<Enter>** again.
5. Move your cursor to the *Card Type* field and press **<Enter>** key until "T3" is displayed.
6. For DACS II AX-11 units with the N+1 Protection Switch, move your cursor to the *Redundancy* field to enable or disable redundancy as desired (not configurable for DACS II AX-4).
7. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.



NOTE:

The same procedure applies when replacing an existing card in a slot.

**Delete Slot
Configuration**

If you opt to delete a card, remove the card first. Then press **D** (Slot Configuration Menu) and a message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel. If you do not remove the card prior to pressing **D**, the following message appears: "-ALERT!- Can not delete a device that is present."

Main Menu

The DS-3 Main Menu is accessed via the Node Summary Menu. From the Main Menu you can configure the module, run diagnostic tests, access utilities, view N+1 Redundancy status (DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware revision levels).

Access Main Menu To access the Main Menu:

1. From the DACS II AX Main Menu, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
Standby SMC not present      N+1 Redundancy State: Enabled
Audio Alarm.....: Enabled

                                Node Summary Menu

Slot#  Configured Type  Device State  Alarm
-----
01     + Octal T1/E1    Standby      None
02     + Octal T1/E1    Online       *None
03     + Octal T1/E1    Online       *None
04     Quad High Speed  Online       None
05     Octal Voice      Online       None
06     Octal Voice      Online       None
07     Quad T1          Online       None
08     Test Access      Online       None
09     + T3             Online       None      Clock Src
10     + T3             Online       None
11     + T3             Standby      None
SMCA    System Manager A Online       None
SMCB    System Manager B Not Present  None
PSX     ProtectionSwitch Online       None

[C]lear error counts  [S]lot Cfg      [E]xpose  [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver  [R]estore
  
```

Figure 13-5. Node Summary Menu

2. Then place your cursor on the slot number where the DS-3 module is located and press **<Enter>**. The *Main Menu* appears.

On the Node Summary Menu, the Configured Type must display "T3" and the Device State must display "On-line" or "Standby" in order to access the T3 Module Main Menu. If the Device State is "Off-line", an alert message is generated.

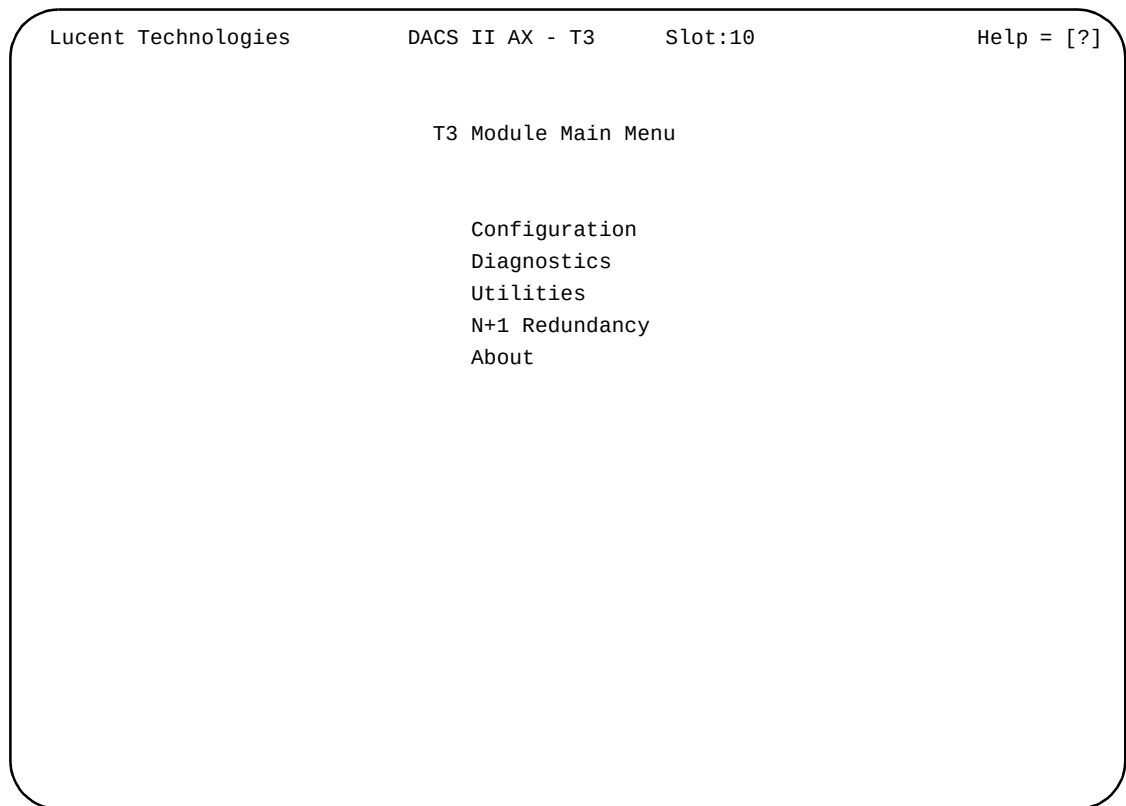


Figure 13-6. DS-3 Main Menu

From the *Main Menu* you can configure the module, run diagnostic tests, access utilities, check N+1 redundancy status, and display module identification (software and hardware revision levels). These procedures are detailed on the following pages.

Configuration Menu

The Configuration Menu provides access to two submenus from which the T1 Channels and the DS-3 Port can be configured.

Configure Module To configure the DS-3 module:

From the Main Menu, place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

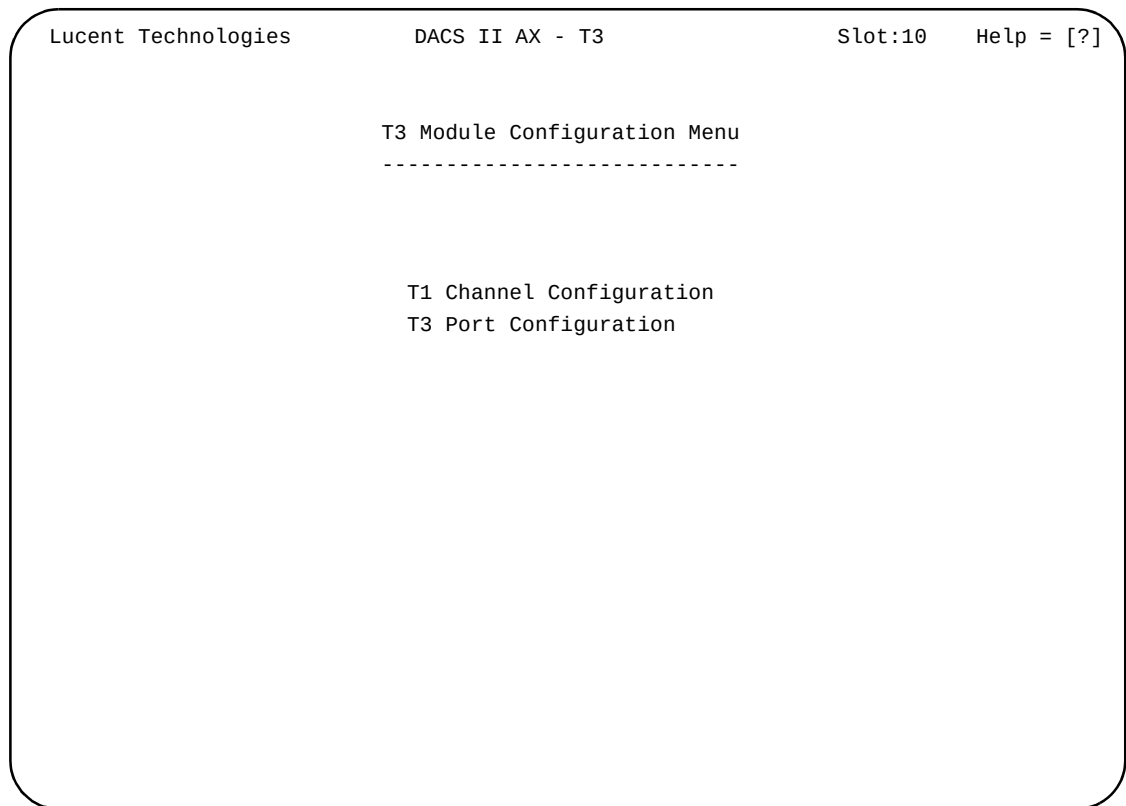


Figure 13-7. Configuration Menu

The *Configuration Menu* has two options:

- Select T1 Channel Configuration to configure the T1 channels resident on the DS-3 line.
- Select T3 Port Configuration to configure the DS-3 line.

T1 Configuration Manager Submenu

Configure T1 Channels

To configure the T1 channels for the DS-3 Line:

1. From the *Configuration Menu*, place your cursor on the *T1 Channel Configuration* field and press **<Enter>**. The following submenu appears:

Lucent Technologies
DACS II AX - T3
Slot:10
Help = [?]

T1 Configuration Manager

Chl	Name	Status	Frm	Density	NetLp	Yalarm	Format	ICode

01	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
02	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
03	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
04	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
05	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
06	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
07	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
08	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
09	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
10	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
11	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
12	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
13	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy
14	Circuit Number	In Service	ESF	Clear	Yes	Yes	54016	Busy

[N]ext page
[C]opy cfg to all

Figure 13-8. T1 Configuration Manager Submenu

2. To change a parameter for an individual channel, move the cursor to the channel to be changed and press **<Enter>**.
3. To copy an existing configuration for a channel to all other channels, move the cursor to the row to be copied and press **C**.
4. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

T1 Configuration Manager Field Descriptions

The following fields appear on the T1 Configuration Manager menu (Figure 13-8).

Chl (Channel): Displays the channel number of the port.

Name: Displays the name entered to identify each channel on the DS-3 module.

Status: Displays the state of the T1 circuits as either *In Service* or *OOS* (Out of Service).

Frm (Framing): Displays the type of framing enabled for Frame Relay as either *D4* or *ESF*.

Density: Displays the density requirements for the circuit as either *Clear* or *62411*.

NetLp (Network Loop): *Yes* indicates that the DS-3 module will respond to diagnostic commands received from the network supplier, *No* indicates that it will not respond.

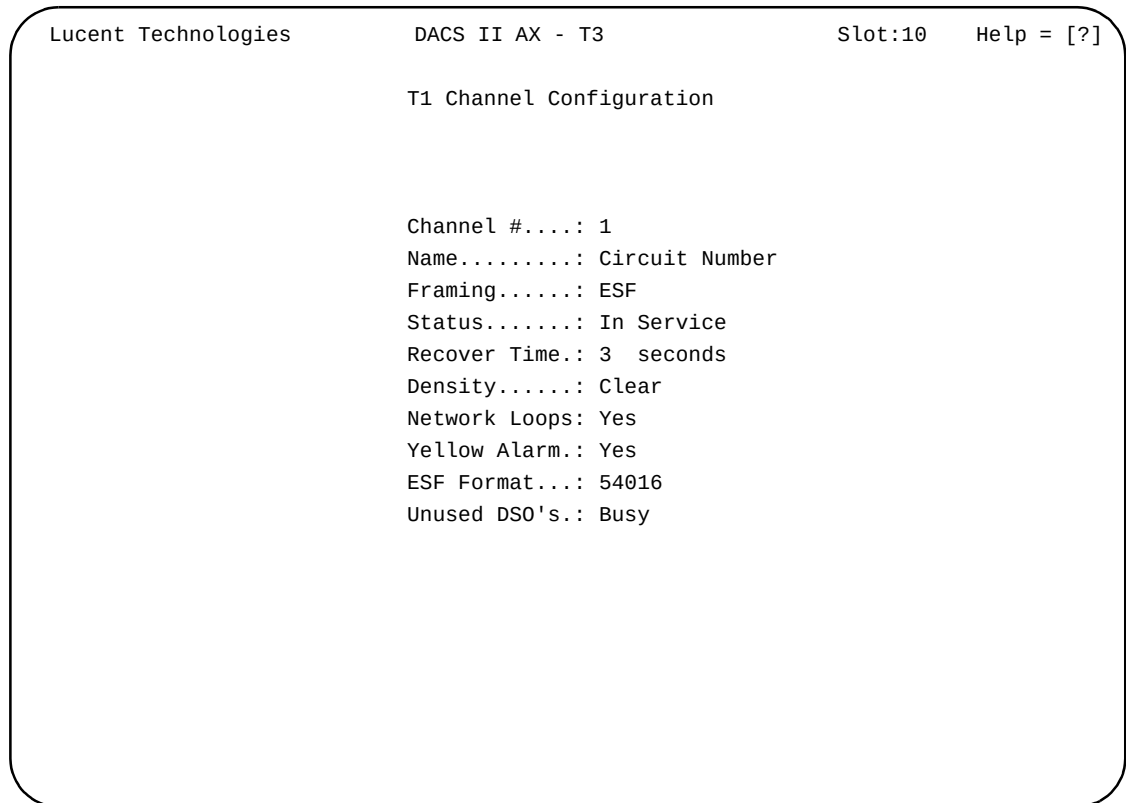
Yalarm (Yellow alarm): *Yes* indicates that the T1 circuit will discard data and send a yellow alarm if it is in a red alarm condition for three seconds.

Format: Displays the types of ESF network commands to which the DS-3 module responds as either *54016* (AT&T Technical Reference 54016) or *T1.403* (ANSI specification T1.403).

ICode (Idle Code): Idle Code displays the state of unused DS0s as either *Busy* (All Ones) or *Idle* (0).

T1 Channel Configuration Submenu

1. From the *T1 Configuration Manager* submenu, place your cursor on any channel number and press **<Enter>**. The following submenu appears:



The screenshot displays a terminal window with the following text:

```
Lucent Technologies          DACS II AX - T3          Slot:10    Help = [?]  
  
T1 Channel Configuration  
  
Channel #....: 1  
Name.....: Circuit Number  
Framing.....: ESF  
Status.....: In Service  
Recover Time.: 3 seconds  
Density.....: Clear  
Network Loops: Yes  
Yellow Alarm.: Yes  
ESF Format...: 54016  
Unused DSO's.: Busy
```

Figure 13-9. T1 Channel Configuration Submenu

These fields are described on the next page.

T1 Configuration Manager Field Descriptions

These fields appear on the T1 Channel Configuration menu (Figure 13-9).

Channel #: This is the channel number of the port. Select any of the 28 channels to invoke and configure using the *T1 Channel Configuration* submenu.

Name: (*text field*) This is a user-defined field. Any name up to 20 characters in length can be entered to identify each channel on the DS-3 module. You may find it beneficial to use circuit numbers to name the channels.

Framing: (*option field*) This information must be obtained from the network supplier. Choose either *D4* or *ESF*.

D4 (SuperFrame) consists of 12 frames of 193 bits each for a total of 2316 bits. Each 193rd bit frame consists of 192 bits preceded by one framing bit (the F bit).

ESF (Extended SuperFrame) includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

Status: (*option field*) This field refers to the state of the T1 circuits. You can put the T1 circuit(s) *In Service* or *Out of Service*.

Recover Time: (*option field*) This field is used to specify how quickly Red/Yellow alarms are cleared following the recovery of the given T1 facility (e.g., valid signal and framing present). Select either *3*, *10*, or *15* seconds.

Density: (*option field*) This information must be obtained from the network supplier. Choose *Clear* or *62411*. A *Clear* network imposes no "ones density" requirements on the user. A *62411* network complies with AT&T Technical Reference #62411 and limits the T1 transmission to no more than fifteen consecutive zeroes. If the Line Code entry is *B8ZS*, choose *Clear*. If the Line Code entry is *AMI*, choose *62411*.

Network Loops: (*option field*) This parameter determines the DS-3 module's ability to respond to diagnostic commands received from the network supplier. Select *Yes* unless the commands are to be passed to another DS-3 device.

Yellow alarm: (*option field*) *Yes* causes the T1 circuit to discard data and send a yellow alarm if it is in a red alarm condition for three seconds. *Yes* must be chosen if the network supplier is a common carrier, such as a telephone company.

ESF Format: (*option field*) This entry describes the types of ESF network commands to which the DS-3 module responds. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between *54016* (AT&T Technical Reference 54016) and *T1.403* (ANSI specification T1.403).

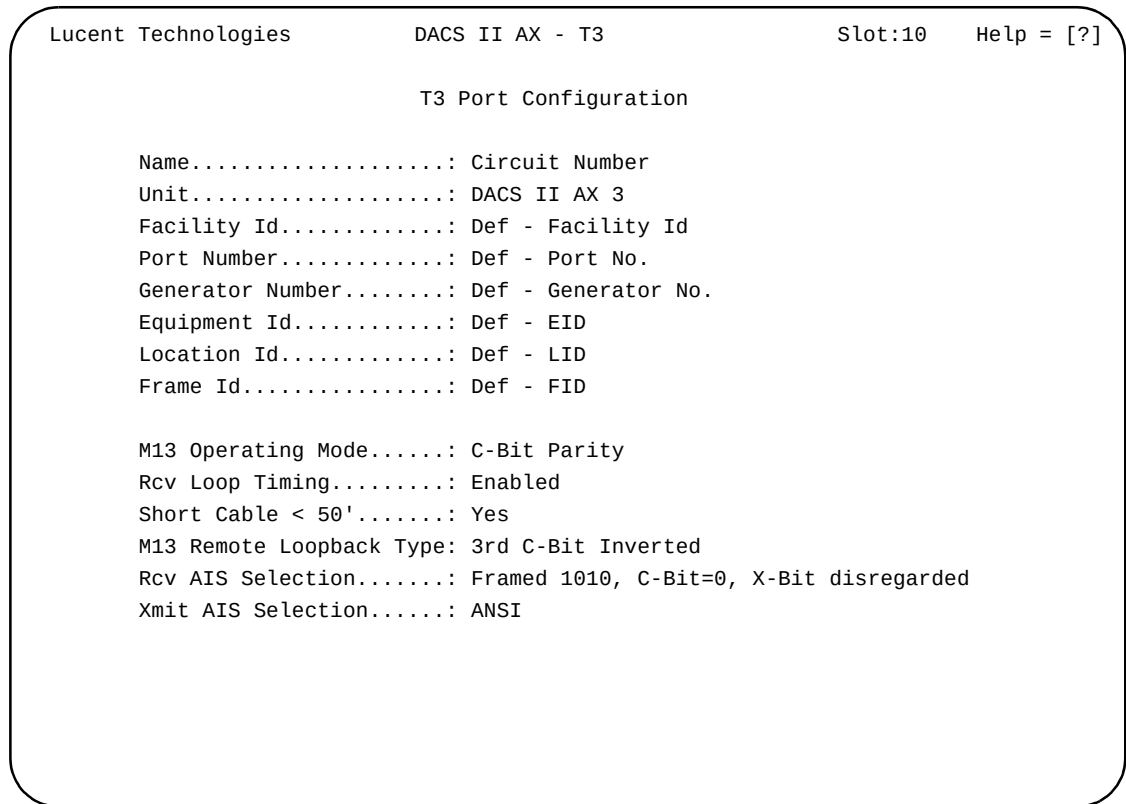
Unused DS0's: (*option field*) This entry is used to select the state of unused DS0s as either *Busy* (All Ones) or *Idle* (0).

T3 Port Configuration Submenu

Configure T3 Port

To configure the T3 Port:

1. From the *Configuration Menu*, place your cursor on the *T3 Port Configuration* field and press **<Enter>**. The following submenu appears:



```
Lucent Technologies      DACS II AX - T3      Slot:10  Help = [?]  
  
      T3 Port Configuration  
  
Name.....: Circuit Number  
Unit.....: DACS II AX 3  
Facility Id.....: Def - Facility Id  
Port Number.....: Def - Port No.  
Generator Number.....: Def - Generator No.  
Equipment Id.....: Def - EID  
Location Id.....: Def - LID  
Frame Id.....: Def - FID  
  
M13 Operating Mode.....: C-Bit Parity  
Rcv Loop Timing.....: Enabled  
Short Cable < 50'.....: Yes  
M13 Remote Loopback Type: 3rd C-Bit Inverted  
Rcv AIS Selection.....: Framed 1010, C-Bit=0, X-Bit disregarded  
Xmit AIS Selection.....: ANSI
```

Figure 13-10. T3 Port Configuration Submenu

Refer to the field descriptions on the following page to assist you in setting up the DS-3 multiplexing parameters.

2. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

T3 Port Configuration Field Descriptions

These fields appear on the T3 Port Configuration menu (Figure 13-10).

Name: *(text field)* This is a user-defined field. Any name up to 20 alphanumeric characters may be entered as a circuit identifier. This entry will appear in the *T3* field of the *Diagnostics Manager Menu*.



NOTE:

The Unit, Facility Id, Port Number, Generator Number, Equipment Id, Location Id, and Frame Id are all optional fields, which can be used by an Administrator to provide information for the DS-3 port.

Unit: *(text field)* Enter a device identifier of up to 5 alphanumeric characters.

Facility Id: *(text field)* Enter the name of the facility where the equipment is located; up to 37 alphanumeric characters may be entered.

Port Number: *(text field)* Enter the number of the port; up to 37 alphanumeric characters may be entered.

Generator Number: *(text field)* Enter the generator number; up to 37 alphanumeric characters may be entered.

Equipment Id: *(text field)* Enter identification for the equipment in use; up to 9 alphanumeric characters may be entered.

Location Id: *(text field)* Enter an identification of where the equipment is located; up to 10 alphanumeric characters may be entered.

Frame Id: *(text field)* Enter identification for the frame; up to 9 alphanumeric characters may be entered.

M13 Operating Mode: *(option field)* The framing selection for the DS-3 to DS-3 multiplexing. This can be either *C-Bit* or *Bellcore M13*. This setting is provided by the carrier.

Rcv Loop Timing (Receive Loop Timing): *(option field)* Controls the DS-3 transmit timing. When *Enabled*, transmit timing is provided by a DS-3 receive clock. When *Disabled*, DS-3 transmit timing is provided by a free running on board oscillator. Refer to Chapter 8, Clocking, for more details on the DS-3 transmit timing.

Short Cable < 50': (*option field*) Controls the line build out of the DS-3 transmitter. Set to *Yes* when attached cable is less than 50 feet long.

M13 Remote Loopback Type: (*option field*) Controls line codes used to set and reset DS-3 remote line loopback requests. This setting is provided by the carrier. These codes cause a DS-3 loopback in remote DS-3 equipment or respond to codes from remote DS-3 equipment. This applies to Bellcore M13 mode only. C-Bit parity has a mechanism defined by specification. Different manufacturers use different patterns in M13 mode.

The DACS II AX DS-3 option list supports a variety of codes, including:

- 3rd C-Bit Inverted
- 2nd C-Bit Inverted
- 1st C-Bit Inverted
- 3rd C-Bit & Stuff Bit Inverted
- 2nd C-Bit & Stuff Bit Inverted
- 1st C-Bit & Stuff Bit Inverted
- Stuff Bit Inverted
- Stuff Bit = 0
- Stuff Bit = 1

Rcv AIS Selection (Receive Alarm Indication Signal Selection): (*option field*)

A DS-3 AIS may be detected in one of six ways. This setting is used to select the DS-3 AIS mechanism that is used for providing an R3AIS alarm.

Alarm options provided by the carrier include:

- Framed 1010, C-Bit=0, X-Bit disregarded
- Framed 1010, C-Bit=0, X-Bit=1
- Framed 1010, C & X Bits disregarded
- Framed 1111 C & X Bits disregarded
- Unframed 1010 pattern
- Unframed all ones pattern

Xmit AIS Selection (Transmit Alarm Indication Signal Selection): *(option field)* A DS-3 AIS may be generated in one of four ways. This setting is used to select the DS-3 AIS generation mechanism.

AIS options provided by the carrier include:

- ANSI
 - Framed all ones & C-Bit set to 1
 - Unframed 1010 pattern
 - Unframed all ones pattern
-

Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks and built-in BERT.

There are multiple loopback options. Each of the 28 T1 links can be independently looped back. The DS-3 line can also be looped back. Loopbacks can occur towards the line or towards the backplane. Loops are shown in Figure 13-12.

The built-in BERT generator and testers can be used along with loopbacks to test and determine the status of the DS-3 module. They may also be used in conjunction with diagnostic facilities on other DACS II AX cards to qualify operation of the backplane connections.

Perform Diagnostics

To view and perform diagnostics on the DS-3 module:

1. From the *T3 Main Menu*, place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

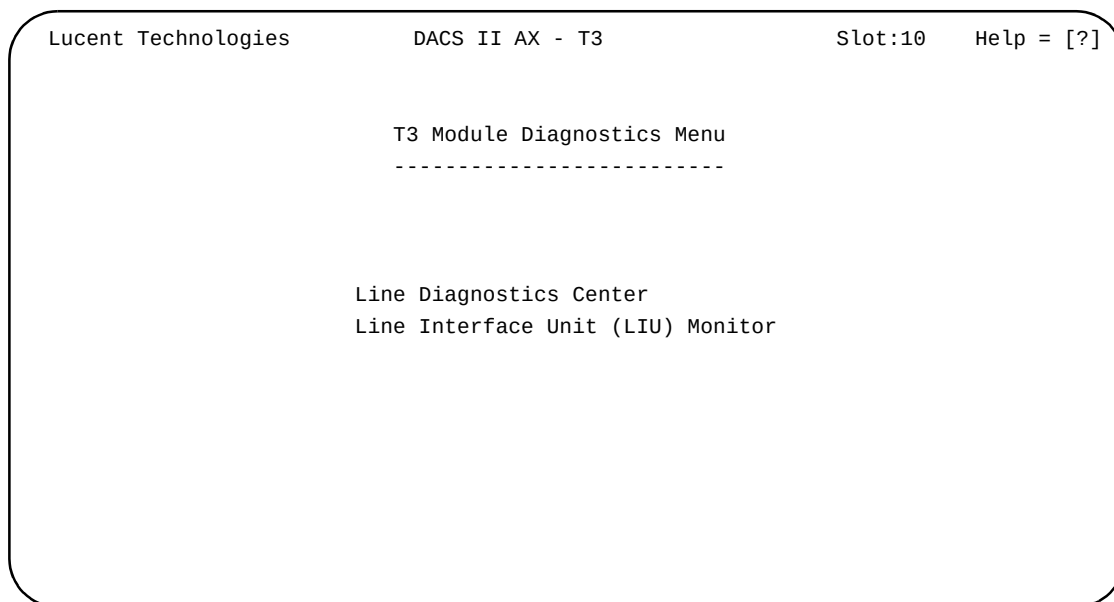


Figure 13-11. T3 Module Diagnostics Menu

2. Place your cursor on the option that you wish to select and press **<Enter>**. These options are described on the following page.

Diagnostics Menu Option Descriptions

The following fields appear on the T3 Module Diagnostics menu (Figure 13-11).

Line Diagnostics Center: Selecting this option will open the *Diagnostics Manager* submenu. From this submenu, line diagnostic options such as loopbacks and built-in BERT can be used.

Line Interface Unit (LIU) Monitor: Selecting this option will open the *T3 Line Interface Unit Monitor* display. This display is a read-only screen, allowing you to view the status of loopbacks and errors.

Backplane Check: Selecting this option will open the *Monitor Backplane Integrity* display, which is a read-only screen that allows backplane monitoring for diagnostic purposes.

Change Count: Displays the number of state changes since the last time the counters were cleared.

DS-3 Module Loops

Figure 13-12 depicts the loops that the DS-3 module supports.

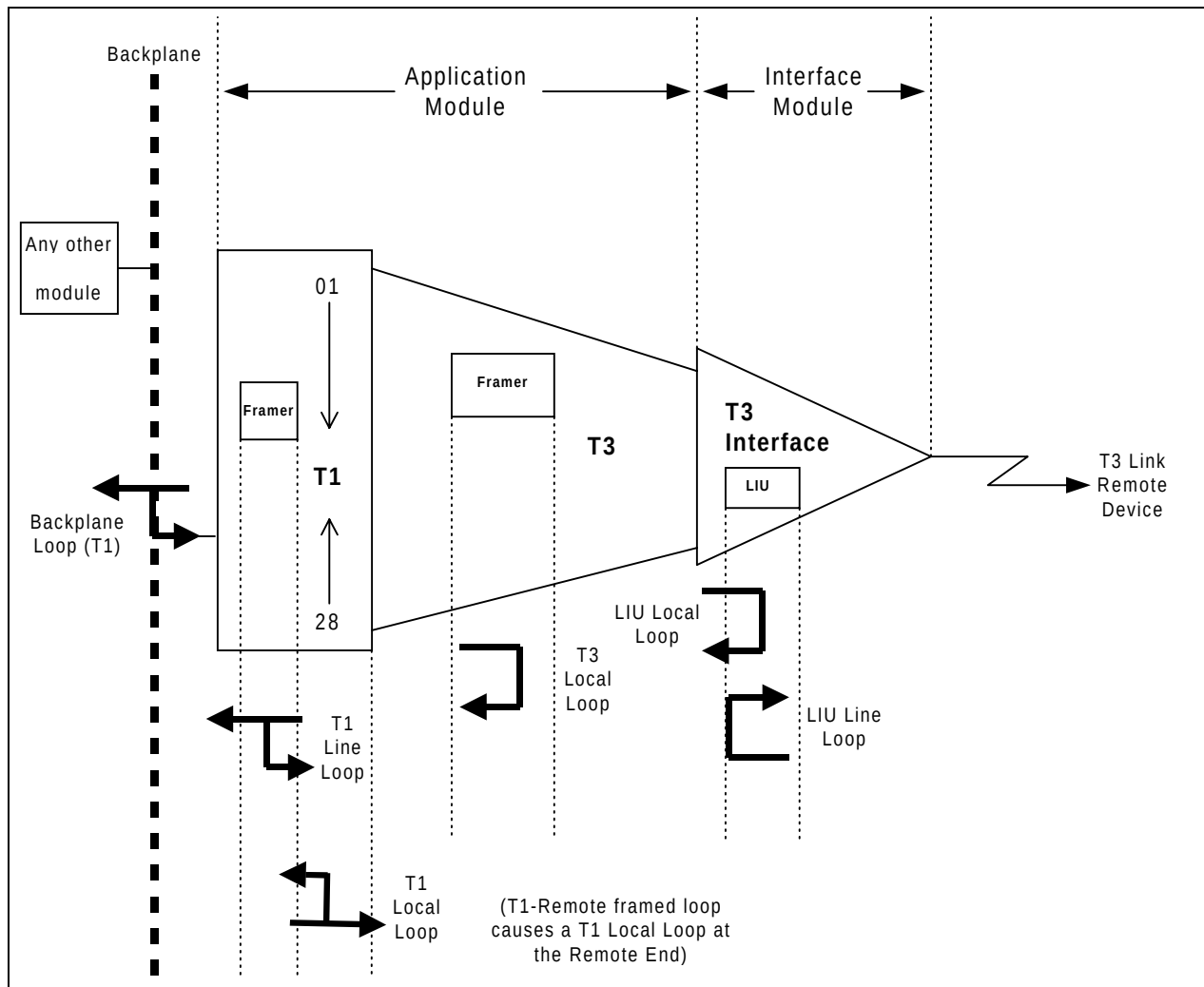


Figure 13-12. DS-3 Module Loops

Diagnostics Manager Submenu

The Line Diagnostics Center is used to set up line diagnostics for the DS-3 Module.

Procedure

To perform Line Diagnostics:

1. From the *Diagnostics Menu*, place your cursor on the *Line Diagnostics Center* field and press **<Enter>**. The following submenu appears:

Lucent Technologies		DACS II AX - T3		Slot:10		Help = [?]	
Diagnostics Manager							
T1	Name	Loop	Back Plane	Status	Red	Yel	Err Sec
1	Circuit Number	Off	Off	OK	0	0	0
2	Circuit Number	Off	Off	OK	0	0	0
3	Circuit Number	Off	Off	OK	0	0	0
4	Circuit Number	Off	Off	OK	0	0	0
5	Circuit Number	Off	Off	OK	0	0	0
6	Circuit Number	Off	Off	OK	0	0	0
7	Circuit Number	Off	Off	OK	0	0	0

T3	Circuit Number	Loop: Off					
LOS: Off AIS: Off OOF: Off RCKF: Off TCKF: Off IDL: Off							
PBitErr: 0 CBitErr: 0 FebeErr: 0 SefErr: 0 Err Sec: 0							

BERT: Off		Local Errs: 0		Remote Errs: 0		Duration: 0	
[T]1-Bert (2047)		[L]iu-Bert		[O]ff bert			
[E]xpose		[S]tatistics (ESF)		[R]egisters (ESF)			
[C]lear counters		[N]ext		[I]n service (toggle view)			

Figure 13-13. Diagnostics Manager Submenu

From the *Diagnostics Manager* submenu, a submenu may be viewed or invoked to perform additional diagnostic actions such as loopbacks, BERT, and viewing additional statistics. To view an additional 7 channels (up to 28 total), press **N**. To clear counters for the T3 port and all 28 links (including those not shown on the current screen), press **C**. The information contained in each field on the screen is detailed on the following pages.

Line Diagnostics Manager Field Descriptions:

T1 Channel Fields

T1: Displays the T1 channel number.

Name: Displays the name assigned to the T1 channel.

Loop: Indicates if a diagnostic loop is active and the type of loop. .

Backplane: Yes in this field indicates that a backplane loop is present.

Status: Displays the T1 channel's current status as *OK* (in service), *OOS* (out of service), *AIS* (Alarm Indication Signal), or **ERROR** if there is more than one error.

Red (Red Alarm): A loss of frame alignment has occurred and synchronization has been lost.

Yel (Yellow Alarm): A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not correctly receiving the DACS II AX signal (i.e., the remote is not in sync or a red alarm has occurred).

CRC (Cyclic Redundancy Check Error): In ESF framing, one or more CRC6 block errors have been detected. A CRC6 block error is a 6-bit algorithm that checks the content of the entire superframe. The D4 framing does not include CRC6; DACS II AX replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance.

Err Sec (Errored Seconds): Displays the number of errored seconds that have occurred since the last time that the counter was reset. The occurrence of a Loss of Frame or a CRC6 error in a one second period is known as an errored second.

DS-3 Port Fields

T3: Displays the DS-3 port name that has been configured via the *T3 Port Configuration* submenu.

Loop: Displays the type of diagnostic loop that has been enabled. *T3-Local* or *LIU-Loop* will be indicated, or *Off* is displayed if no loop has been enabled. Loops are shown in Figure 13-12.

LOS (Loss of Signal): The Loss of Signal alarm indicates a loss of signal. Specifically, the incoming data stream is at a logic zero for greater than 1022 clock cycles.

AIS (Alarm Indication Signal): The Alarm Indication Signal indicates that the alarm condition chosen from the *T3 Port Configuration* submenu (*Rcv AIS Selection* field) is present.

OOF (Out of Frame): The Out of Frame alarm indicates that the receive data stream does not meet pre-set framing criteria.

RCKF (Receive Clock Failure): The Receive Clock Failure alarm indicates a failure of the receive clock.

TCKF (Transmit Clock Failure): The Transmit Clock Failure alarm indicates a failure of the transmit clock.

IDL (Idle): If the Receive Idle Pattern is set to *On*, allows the unit to transmit the idle signal.

PBitErr (P-Bit Errors): Displays the number of P-Bit Errors that have occurred since the last counter reset. A P-Bit Error is indicated if incorrect parity bits are being received.

CBitErr (C-Bit Errors): Displays the number of C-Bit Errors that have occurred since the last counter reset. A C-Bit Error is a parity error involving DS-3 to DS-3 multiplexing.

FebeErr (Far End Block Errors): Displays the number of Far End Block Errors that have occurred since the last counter reset. A Far End Block Error indicates a remote device has errors.

SefErr (Severely Errored Frame Errors): Displays the number of Severely Errored Frames that have occurred since the last counter reset. A Severely Errored Frame error is indicated if the receive signal does not meet the requirements of ANSI T1.231.

Err Sec (Errored Seconds): Displays the number of seconds that the alarm condition has been present or was present. The counters can be reset by pressing **C**.

BERT Fields

BERT: Displays the type of BERT that is currently enabled. If BERT is not enabled, then *Off* is indicated.

Local Errs: Displays the number of local errors detected when BERT is enabled. Local errors are errors that originate from the link side.

Remote Errs: Displays the number of remote errors detected when BERT is enabled. Remote errors are errors that originate from the backplane.

Duration: Displays the amount of time that BERT has been enabled.

Select T3/LIU Loop

To select a T3/LIU Loop:

1. From the *Diagnostics Menu*, place your cursor on the *Line Diagnostics Center* field and press **<Enter>**. The *Diagnostics Manager Submenu* (Figure 13-13) appears.

With your cursor on the field that contains the DS-3 port name, configured earlier (Default = Circuit Number), press **<Enter>**. The following submenu appears:

```
Lucent Technologies      DACS II AX - T3      Slot:10  Help = [?]  
  
T3/LIU Loop Select Screen  
-----  
  
Loop Type: T3-Local
```

Figure 13-14. T3/LIU Loop Select Submenu

2. The *T3/LIU Loop Select* submenu is used to select T3/LIU Loops for diagnostic purposes. The following can be selected by pressing **<Enter>** to cycle through the choices:
 - **Off** - No loop will be enabled.
 - **T3-Local** - A T3 Local Loop will be enabled.
 - **LIU-Loop** - An LIU Loop will be enabled.DS-3 loops are shown in Figure 13-12.
3. Once the selection has been made, press **X** to save changes. When prompted: "Are you sure (Y/N)?" Press **Y**.

Select T1 Loop

To select a T1 Loop:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable T1 channel (#1 - 28), and press **<Enter>**. The following submenu appears:

```
Lucent Technologies      DACS II AX - T3      Slot:10  Help = [?]

                        Link: 1
                        T1 Loop Select Screen
                        -----

                        Loop Type.....: Off
                        Backplane Loop: Off
```

Figure 13-15. T1 Loop Select Submenu

2. From the *T1 Loop Select* submenu, you can enable a T1 loop or a backplane loop. To do so, move your cursor to either field and press **<Enter>** until the correct selection appears.
 3. Once the selection has been made, press **X** to save changes. When prompted: "Process Loop Command? Are you sure (Y/N)?" Press **Y**.
-

T1 Loop Select Field Descriptions

These fields appear on the T1 Loop Select submenu (Figure 13-15).

Loop Type:

- **T1-Local** - Local Loop causes data from the DACS II AX to be looped back to itself at the Network Interface port.
- **T1-Remote (framed)** - Remote Loop causes a loop at the distant end of a point-to-point circuit, and is useful for looping back testing initiated from the local side.
- **T1-Line** - Line Loop causes data at the NI to be looped back towards the network from the DACS II AX unit where the command was entered. In a point-to-point circuit, Line Loop is useful for looping back any testing initiated by the other end.
- **Off** - No T1 loop is enabled.

Backplane Loop: Backplane Loop causes data at the backplane to be looped towards the network. Select *Yes* to enable the backplane loop, and *No* to disable the backplane loop.

T1 BERT with 2047 Test Pattern

To perform T1 BERT with a 2047 test pattern:

1. From the *Diagnostics Manager* submenu, place your cursor on an active T1 channel (#1 - 28) and press **T**.
2. The following screen appears: "Turn on Bert for T1 channel #XX Are you sure (Y/N)?" Press **Y** to start the T1 BERT. The *Diagnostics Manager* submenu re-appears, and the screen indicates the T1 channel on which BERT is enabled. Also displayed are *Local Errors*, *Remote Errors*, and *BERT Duration*. Refer to Chapter 5 to configure connections.



NOTE:

BERT can be run on only one T1 channel at a time.

3. To turn off the BERT, move your cursor to the same T1 channel and press **O**. The following screen appears: "Turn off Bert for T1 channel #XX Are you sure (Y/N)?" Press **Y** to end the T1 BERT. The *Diagnostics Manager* submenu re-appears.
-

**Display Framer
Status for T1
Channel**

To view Framer Status for a T1 channel:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable T1 channel (#1 - 28) and press **E**. The following display appears:

```

Lucent Technologies          DACS II AX - T3          Slot:10    Help = [?]

                                T1 Framer Channel Status
Framer#: 0                      Channel#: 1    VoiceTs: 0

                                State Err Sec          Counter
-----
Red Alarm.....: Off 0      Crc Errors.....: 0
Yellow Alarm...: Off 0      Fbe Errors.....: 0
Loss Of Signal.: Off 0      Errored Seconds...: 0
AIS Indication.: Off 0      Trunk Conditioning: Off
Out Of Frame...: Off 0      Mismatch Shadow...: Off
CFA Indication.: Off 0
SEF Indication.: Off 0
Transmit Slip...: Off 0
Receive Slip...: Off 0

[C]lear counters      [R]eset framer
  
```

Figure 13-16. T1 Framer Channel Status Display

2. From the *T1 Framer Channel Status* display, you can press **C** to clear counters, or **R** to reset the framer. The information contained in each field on the screen is detailed on the following pages.

**CAUTION:**

Resetting the framer will cause data to be momentarily corrupted.

T1 Framer Channel Status Field Descriptions

These fields appear on the T1 Framer Channel Status menu (Figure 13-16).

Framer #: Displays the framer number for the selected channel.

Channel #: Displays the T1 channel number for which the Framer Status is being displayed.

Voice Ts (Voice Timeslot): Displays the timeslots which have been configured for voice traffic, if any.

State: A display of *On* next to any of the alarm entries indicates that an alarm currently exists. A display of *Off* indicates that the alarm is not present, but if the errored seconds field has a count, then this alarm has occurred sometime in the past (since the last time that the counter was cleared).

Err Sec (errored Seconds): The display count indicates the quantity of seconds that the alarm condition has been present or was present. The counters can be cleared by pressing **C**.

Red Alarm: A loss of frame alignment has occurred and synchronization has been lost.

Yellow Alarm: A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not correctly receiving the DACS II AX signal. (The network is not in sync or a red alarm has occurred.)

Loss of Signal: Indicates a loss of signal detection. No T1 signal is present on the RX pair to the DACS II AX.

AIS Indication (Alarm Indication Signal Indication): An unframed "all ones" condition has been detected.

Out of Frame: Indicates that the receive data stream does not meet pre-set framing criteria.

CFA Indication (Change of Frame Alignment Indication): Change of Frame Alignment is indicated if one or more frame alignment bit errors have been detected. This does not mean that synchronization has been lost.

SEF Indication (Severely Errored Frame Indication): A Severely Errored Frame is indicated if the receive signal does not meet the requirements of ANSI T1.231.

Transmit Slip: Transmit Slip is indicated if slip has been detected in the transmit path.

Receive Slip: Receive Slip is indicated if slip has been detected in the receive path.

Counter: Displays the number of errors since the last time the counters were cleared.

Crc Errors (Cyclic Redundancy Check Error): In ESF framing, one or more CRC6 block errors have been detected. A CRC6 block error is a 6-bit algorithm that checks the content of the entire superframe. The D4 framing does not include CRC6; DACS II AX replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance.

Fbe Errors (Framing Bit Error): One or more frame alignment bit errors have been detected. This does not mean that synchronization has been lost.

Trunk Conditioning: If trunk conditioning status is *On* and the control bits indicate a red or yellow alarm is being received, the following occurs:

- Receive data is disabled at all DS0s.
- Idle code is written to corresponding slip buffer according to content of each timeslot (data/voice).

If trunk conditioning status is *Off*, then no alarms are being received.

Mismatch Shadow: If the status is *On*, it indicates that either one of the framers is bad (hardware failure).

View ESF Statistics

To view ESF statistics:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable T1 channel (#1 - 28), and press **S**. The *ESF Statistics* display for the selected T1 channel appears.



NOTE:

The selected T1 channel must be configured as ESF, otherwise an error message will appear.

Lucent Technologies	DACS II AX - T3	Slot:10	Help = [?]
ESF Statistics For T1 Channel#: 1			
Register	Curr	24 Hr	

Errored seconds.....:	0	0	
Failed seconds (UAS)....:	0	0	
Severely errored seconds:	0	0	
Bursty errored seconds..:	0	0	
Loss of frame count.....:	0	0	
Time in interval.....:	882		
# Valid intervals.....:	176		
ESF status.....:	00000000		

Figure 13-17. ESF Statistics Display

The *ESF Statistics* display is a read-only screen. It allows you to view both current and 24-hour ESF statistics. The Current Statistics column displays the counts for the current time interval (maximum 15 minutes). The 24 Hour Statistics column displays the counts for the preceding 24-hour period. The information contained in each field on the screen is detailed on the following pages.

ESF Statistics Field Descriptions

These fields appear on the ESF Statistics display (Figure 13-17).

Errored Seconds: The occurrence of a Loss of Frame or a CRC6 error in a one second period is known as an errored second. This field displays the number of errored seconds that have occurred.

Failed Seconds (UAS): Each one second period during the occurrence of a Failed Signal State (10 consecutive errored seconds) is known as a failed second. This field displays the number of failed seconds that have occurred.

Severely Errored Seconds: A one-second period in which 320 or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.

Bursty Errored Seconds: A one-second period in which more than one but less than 320 CRC6 errors have occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

Loss of Frame Count: A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time in Interval: A timer that tracks the number of seconds (0-900) in one 15-minute interval.

Valid Intervals: A counter that tracks the total number of 15-minute intervals in a 24 hour period (up to 96).

ESF Status: This field defines the status of the T1 line. The status is defined by an 8 digit number that is described below:

example: F00000L0

Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.

Digit #2 - "U" or "0" where "U" indicates an unavailable signal state.

Digit #3 through #6 and #8 are always "0."

Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.

Display ESF Registers

To view ESF Registers:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable T1 channel (#1 - 28) and press **R**. The *ESF Registers* display for the selected T1 channel appears.

The selected T1 channel must be configured as ESF, otherwise an error message will appear.

Lucent Technologies

DACS II AX - T3

Slot:10

Help = [?]

ESF Registers For T1 Channel #: 1

INT	ES	FS	SES	BES	INT	ES	FS	SES	BES	INT	ES	FS	SES	BES
01.	000	000	000	000	17.	000	000	000	000	33.	000	000	000	000
02.	000	000	000	000	18.	000	000	000	000	34.	000	000	000	000
03.	000	000	000	000	19.	000	000	000	000	35.	000	000	000	000
04.	000	000	000	000	20.	000	000	000	000	36.	000	000	000	000
05.	000	000	000	000	21.	000	000	000	000	37.	000	000	000	000
06.	000	000	000	000	22.	000	000	000	000	38.	000	000	000	000
07.	000	000	000	000	23.	000	000	000	000	39.	000	000	000	000
08.	000	000	000	000	24.	000	000	000	000	40.	000	000	000	000
09.	000	000	000	000	25.	000	000	000	000	41.	000	000	000	000
10.	000	000	000	000	26.	000	000	000	000	42.	000	000	000	000
11.	000	000	000	000	27.	000	000	000	000	43.	000	000	000	000
12.	000	000	000	000	28.	000	000	000	000	44.	000	000	000	000
13.	000	000	000	000	29.	000	000	000	000	45.	000	000	000	000
14.	000	000	000	000	30.	000	000	000	000	46.	000	000	000	000
15.	000	000	000	000	31.	000	000	000	000	47.	000	000	000	000
16.	000	000	000	000	32.	000	000	000	000	48.	000	000	000	000

[N]ext page

Figure 13-18. ESF Registers Display

2. The *ESF Registers* display is a read-only screen. Press **N** to view the next 48 intervals. The information contained in each field on the screen is detailed on the following page.

ESF Registers Field Descriptions

These fields appear on the ESF Registers display (Figure 13-18).

INT (Interval): The interval number for the ninety-six 15-minute intervals preceding the current interval, with 01 being the most recent.

ES (Errored Seconds): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred.

FS (Failed Seconds): Each one second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field displays the number of severely errored seconds that have occurred.

SES (Severely Errored Seconds): A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.

BES (Bursty Errored Seconds): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

Display In-Service T1 Channels

To view the T1 Channels currently in service:

From the *Diagnostics Manager* submenu, press **I**. The display will refresh, and only those T1 channels which are currently in service will appear. Press the **I** key again, and all 28 links are displayed.

T3 Line Interface Unit Monitor Submenu

The T3 Line Interface Unit (LIU) Monitor is used to observe the condition of the DS-3 line and report its status.

Display DS-3 Line Status

To view the DS-3 Line Status:

1. From the *Diagnostics Menu*, place your cursor on the *Line Interface Unit (LIU) Monitor* field and press **<Enter>**. The following display appears:

Lucent Technologies DACS II AX - T3 Slot:10 Help = [?]

T3 Line Interface Unit Monitor

	State	Errored Seconds
	-----	-----
Line Loop.....	Off	
Local Loop.....	Off	
Generate PRBS.....	Off	
Transmit AIS.....	Off	
Short Cable.....	Off	
Digital LOS.....	Off	0
Analog LOS.....	Off	0
Excess Zeros.....	Off	0
Coding Violation..	Off	0
PRBS Check.....	Off	0

[C]lear counters

Figure 13-19. Line Interface Unit Monitor Display

2. The *T3 Line Interface Unit Monitor* display is a read-only screen. The only option available is pressing **C** to clear counters. Descriptions of each field on this screen are supplied on the following page.

Line Interface Unit Monitor Field Descriptions

These fields appear on the Line Interface Unit Monitor (Figure 13-19).

State: Displays the state of the applicable field as either *Off* or *On*.

Errored Seconds: A one-second period with one or more errored blocks or at least one defect is known as an errored second. This field displays the number of errored seconds that have occurred for the applicable field.

The states of the following conditions are displayed:

Line Loop: *On* indicates that a line loop has been enabled.

Local Loop: *On* indicates that a local loop has been enabled.

Generate PRBS: PRBS (Pseudo-Random Binary Sequence) is a background test used to monitor the DS-3 link. *On* indicates that this signal is being generated and sent to a remote unit.

Transmit AIS: *On* indicates that an AIS (Alarm Indication Signal) is being transmitted to a remote unit.

Short Cable: *On* indicates that a short cable (<50') has been configured in the T3 Port Configuration Menu.

Digital LOS: *On* indicates that the signal has been lost. Specifically, there have been 175 (± 75) consecutive zeros in the data stream.

Analog LOS: *On* indicates that the signal has been lost. Specifically, less than 28% of the data stream is ones.

Excess Zeros: *On* indicates that excess zeros have been detected.

Coding Violation: *On* indicates that a violation has been detected in the B3ZS coding scheme.

PRBS Check: Indicates that the PRBS (Pseudo-Random Binary Sequence) is being received from the remote end is currently being checked. *On* indicates that the PRBS is good, while *Off* indicates that the PRBS is bad.

Utilities Menu

The Utilities Menu provides access to two submenus from which you can reset the DS-3 Module or set its status.

Access Utilities

To access the DS-3 Utilities:

1. From the *Main Menu*, place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

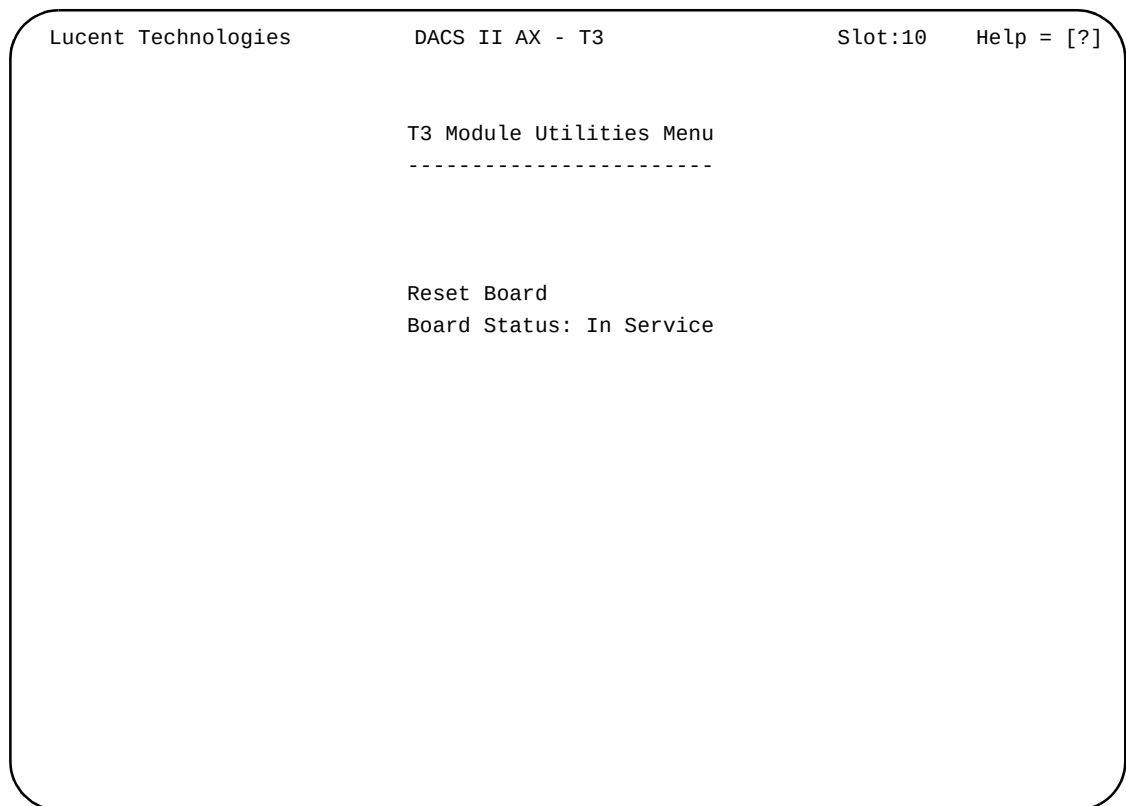


Figure 13-20. Utilities Menu

From the *Utilities Menu*, you can reset the DS-3 Module or change the status to *In Service* or *Out of Service*.

Reset DS-3 Module

**WARNING:**

Resetting the module will cause data to be momentarily corrupted.

To reset the DS-3 module:

The Reset utility causes the DS-3 module card to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

1. From the DS-3 *Utilities Menu*, place your cursor on the *Reset Board* field and press **<Enter>**. The following screen appears:

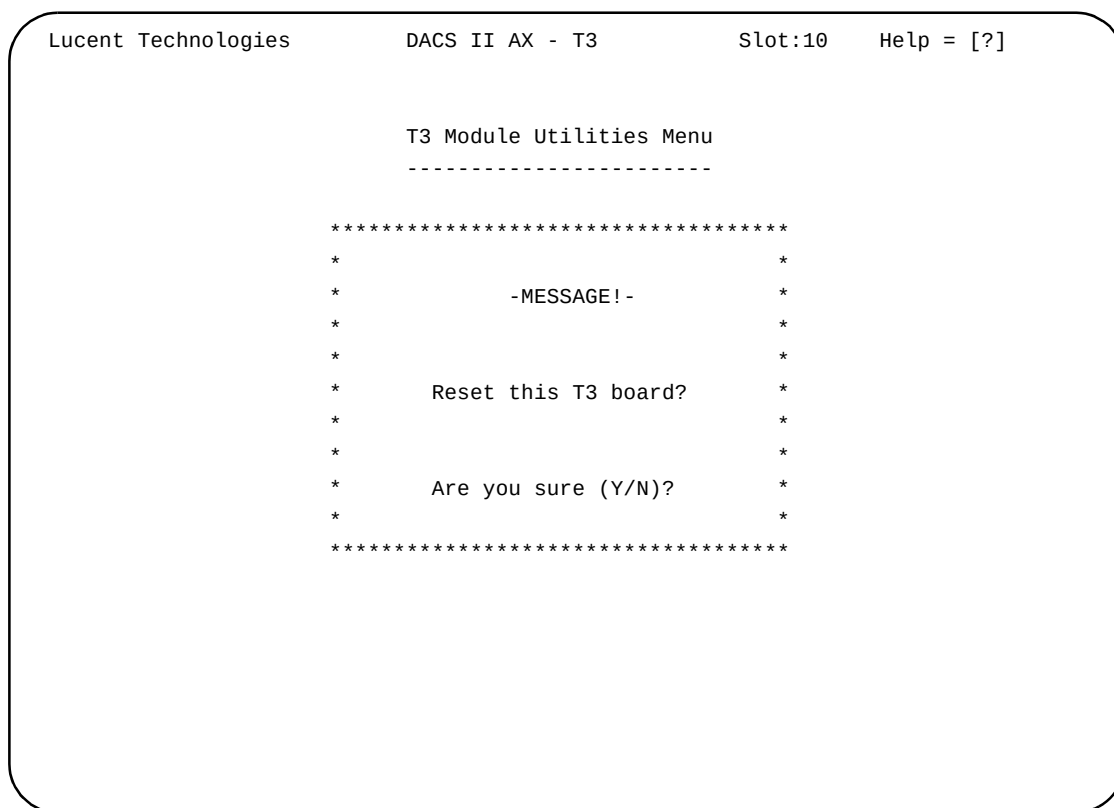


Figure 13-21. Reset Board Screen

2. Press **Y** to reset the board. The next screen appears with the following message: "Alert! Please wait while we establish communications with the system manager! Press any key to continue." Wait a few seconds, and you are returned to the *Node Summary Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, the DS-3 module's state may cycle through a combination of "On-line", "Standby", and "Out of Service", and finally "On-line". This is a normal occurrence when the device resets.

Set Board Status

To set the Board Status:

The Board Status screen allows the Administrator to put a device *In Service* or *Out of Service*.

**NOTE:**

If a module is set to "Out of Service", you cannot enter the Diagnostics Menu.

1. From the *Utilities Menu*, place your cursor on the *Board Status* field and press **<Enter>**.

If the board status was *In Service*, the following menu appears:

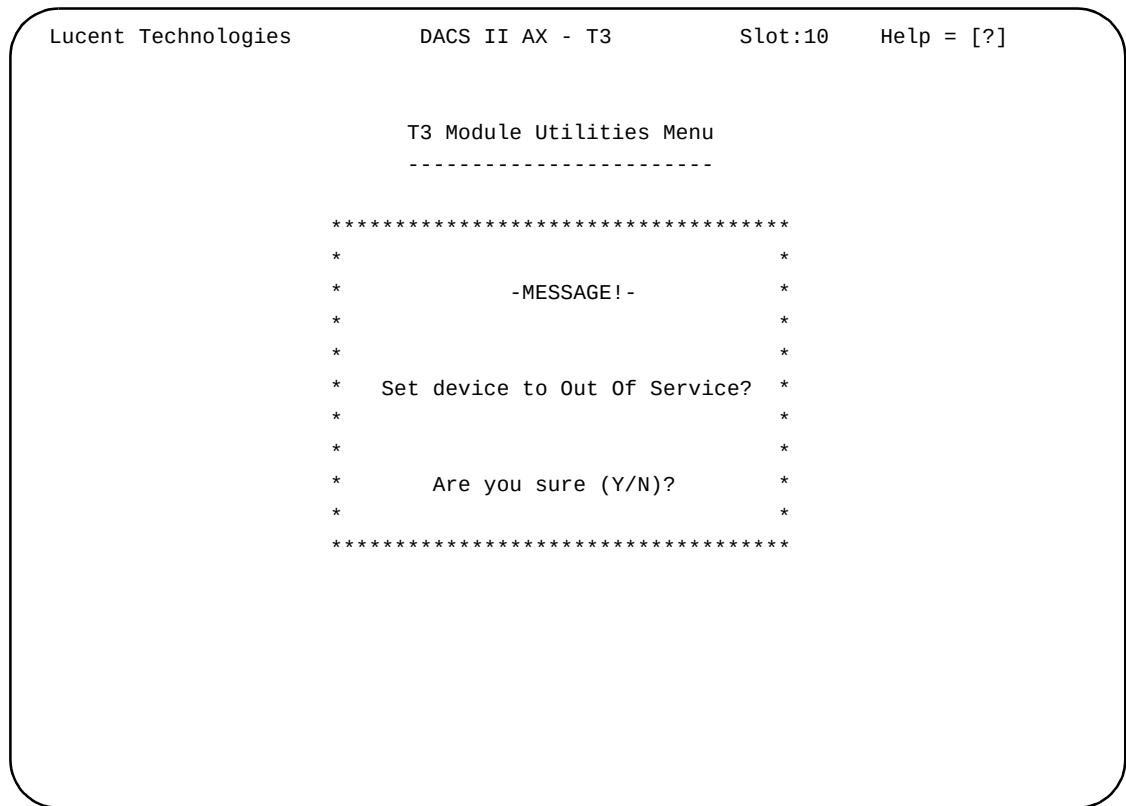


Figure 13-22. Board Status Screen

2. Press **Y**. The board is set to *Out of Service*, and you are returned to the *Utilities Menu*.
3. If the board status was *Out of Service*, the following menu appears:

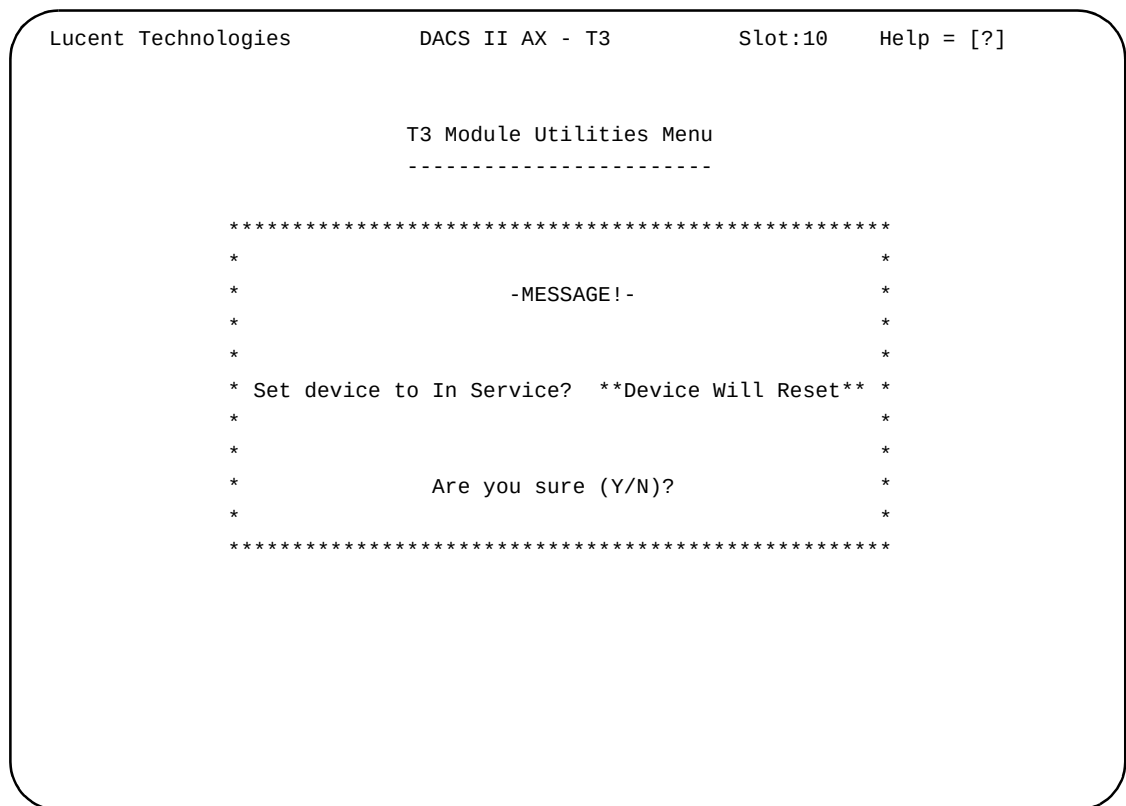


Figure 13-23. Change Board Status Screen

4. Press **Y**. The unit will be reset, the board will be set to *In Service*, and you are returned to the *Node Summary Menu*. Press **N**, and you are returned to the *Utilities Menu*.



NOTE:

It can take up to 20 seconds for the Board Status to change to *In Service*. Once you have been returned to the *Node Summary Menu*, the DS-3 module's state may cycle through a combination of "On-line", "Standby", "Out of Service" and finally "On-line". This is a normal occurrence when the device resets.

N+1 Redundancy Menu

The N+1 Redundancy Menu allows you to view N+1 Redundancy status. For specific information and instructions on setting up your DS-3 device cards in a redundancy group, refer to Chapter 10, N+1 Protection Switch.

N+1 Redundancy is only available on DACS II AX-11 units equipped with the N+1 Protection Switch.

Display Redundancy Information

To display N+1 Redundancy information:

1. From the *T3 Main Menu*, move your cursor to the *N+1 Redundancy* field and press **<Enter>**. The following menu appears:

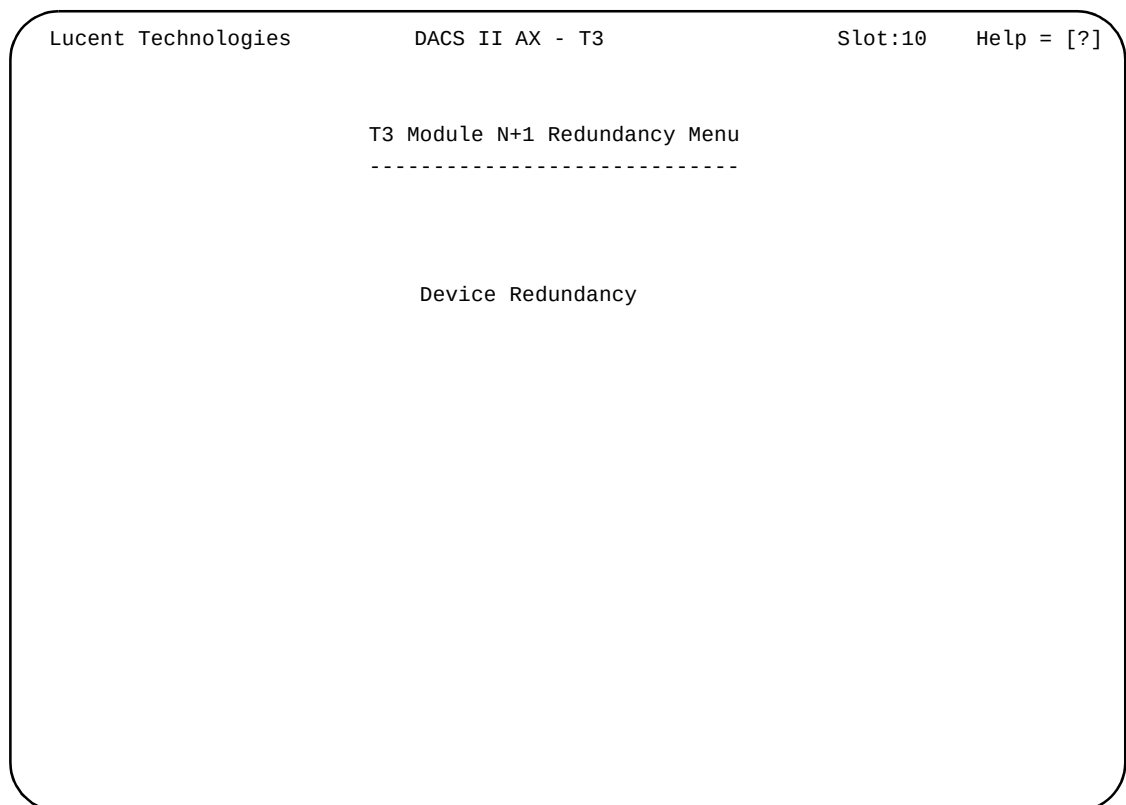


Figure 13-24. T3 Module N+1 Redundancy Menu

2. Then place your cursor on the *Device Redundancy* field and press **<Enter>**. The following display appears:

Lucent Technologies

DACS II AX - T3

Slot:10

Help = [?]

N+1 Redundancy Status Menu

Redundancy...: Enabled
Card Type...: Primary
Device State: Online

	State	Change Count
Frame Sync Pulse.....	OK	0
Backplane Timeslot Management:	OK	0
Communication with System Mgr:	OK	0
Rear Card.....	OK	0
Framers.....	OK	0

[C]lear counters

Figure 13-25. N+1 Redundancy Status Display

The *N+1 Redundancy Status* display is a read-only screen. Descriptions for each field on this screen are supplied on the following page.

N+1 Redundancy Status Field Descriptions

These fields appear on the N + 1 Redundancy Status display (Figure 13-25).

Redundancy: *Enabled* means that the DS-3 Module is a member of an N+1 Redundancy Group, while *Disabled* means that it is not a member of an N+1 Redundancy Group.

Card Type: Displays whether the DS-3 module is configured as *Primary* or *Secondary*.

Device State: Displays the current state of the DS-3 module as either *On-line*, *Off-line*, *Standby*, *Defective*, or *Bus Error*.

State: Displays the status of the following:

- **Frame Sync Pulse:** If the state is Missing, it indicates a loss of synchronization error.
- **Backplane Timeslot Management:** If the state is Invalid, it indicates that the backplane is flooded with more timeslots than the card can handle.
- **Communication with System Mgr:** If the state is Lost, it indicates that the device has not received any messages from the SMC II for more than one minute.



NOTE:

If the state reads "Lost", you most likely have problems with your DS-3 module, not the SMC II.

- **Rear Card:** If the state is Missing, it indicates the rear card is not being detected. The device will reset after the rear card is detected again.
- **Framers:** If the state is Bad, it indicates either one of the framers is bad (i.e., hardware failure).

Change Count: Displays the number of state changes since the last time the counters were cleared.

About Menu

The About Menu provides version information for various DS-3 module elements.

Display Identification Information

To display module identification information:

1. From the *Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following display appears:

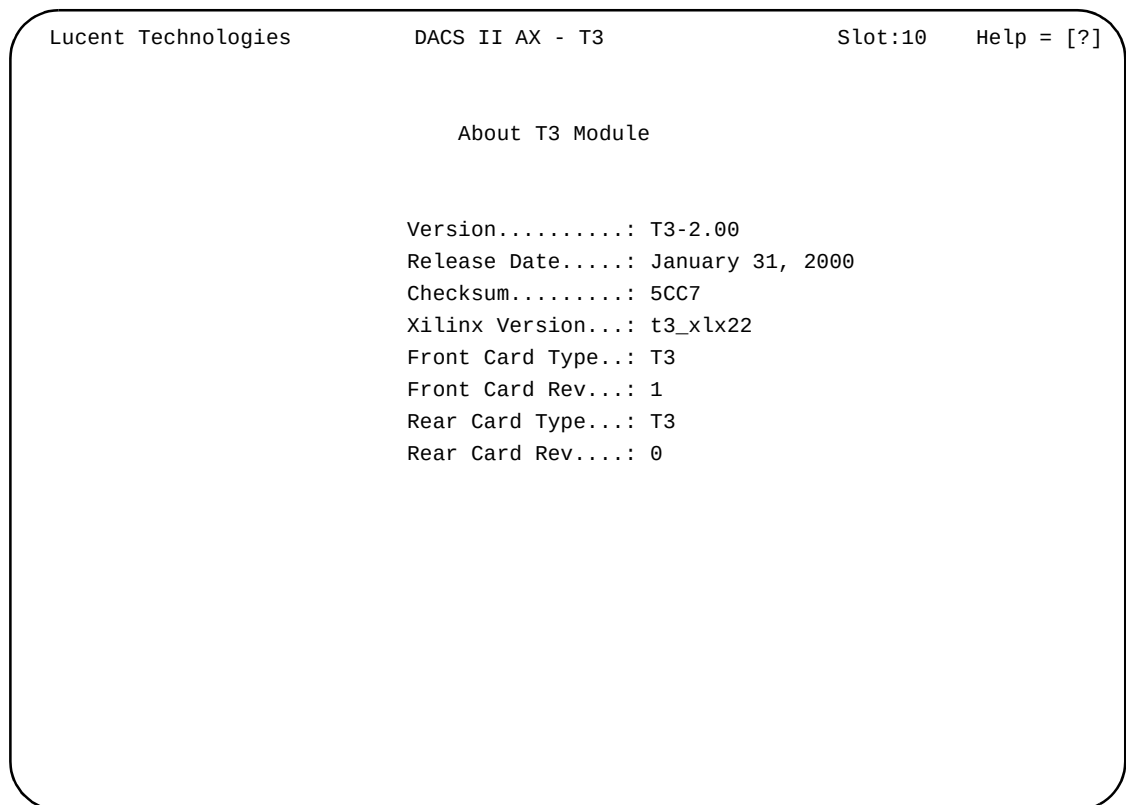


Figure 13-26. About T3 Module Display

2. The *About T3 Module* display is a read-only screen. Descriptions for each field on this screen are supplied on the following page.
-

About Menu Field Descriptions

These fields appear on the About T3 Module menu (Figure 13-26).

Version: Displays the software version currently residing in the DS-3 module's flash memory.

Release Date: Displays the date of software release.

Checksum: Displays the sum of all bytes in the DS-3 module's flash memory at power up. Also used to identify software version.

XILINX Version: Displays the hardware version of downloadable, programmable devices.

Front Card Type: Displays the type of Application Module in the system.

Front Card Rev: Displays the Application Module's hardware revision level.

Rear Card Type: Displays the type of Interface Module in the system.

Rear Card Rev: Displays the Interface Module's hardware revision level.

Contents

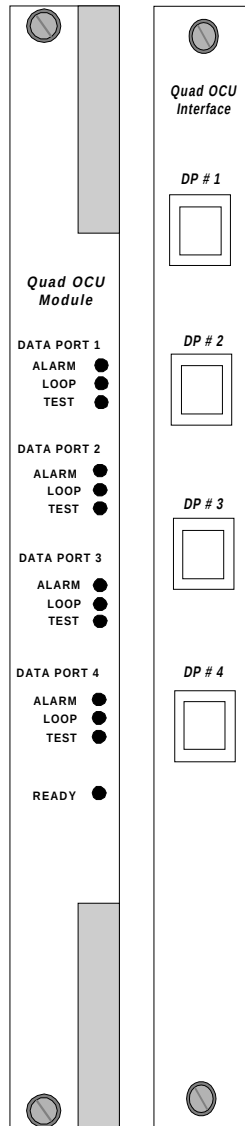
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Physical Description



The Quad Office Channel Unit (OCU) allows the DACS II AX to interface with Channel Service and Data Service Units (CSU/DSU). It has four completely independent channels that support 56 Kbps or 64 Kbps full duplex serial data rates.

There are four sets of LEDs, one set for each port, and a READY LED.

- **ALARM** - A red LED indicates an alarm condition has occurred on the port. The alarm could result from one or all of the following conditions: loss of signal on 56 or 64 Kbps; loss of framing for 64 Kbps DDS service.
- **LOOP** - A yellow LED indicates a loopback condition has occurred on the port. One or all of the following conditions result in a loopback: the sealing current is reversed for CSU; line relay is On for local loopback; LXT-400 is in local loopback toward the DDS.
- **TEST** - A green LED indicates that a test is being performed on the port. One or all of the following conditions result in a test: test pattern generated toward DDS compares to Rx data from the DDS; test patterns are not being generated but 2047 is seen in both the Tx and Rx data paths.
- **READY** - A green LED indicates the CPU is up and running and the Quad OCU interface module powered up.

Thumb screws are provided at the top and bottom of the bezels to secure the modules in the chassis and to make an electrical connection to frame ground for regulatory emission compliance. The electrical connection to frame ground protects the application module from static discharge.

➤ **NOTE:**
The N + 1 Protection Switch does not supply redundancy for the Quad OCU module set.

Figure 14-1. Quad OCU Application/Interface Module Set

The Quad OCU interface module contains four data ports with interfaces that provide for the electrical and physical termination of four DDS loops. Each interface provides a 4-wire DDS-compatible, full-duplex, balanced synchronous (surge protected) termination for the loop. Each data port can be configured independently at the system console for operation at a data rate of 56 Kbps or 64 Kbps. Framing bits are inserted on the line when 64 Kbps data operation is configured. The data stream is an Alternate Mark Inversion (AMI) encoded pulse stream.

In addition, the Quad OCU interface module has DC power supplies to provide sealing current for each port. The sealing current is required in order to perform a remote loopback. The remote loopback is performed by reversing the sealing current direction to the distant CSU when the CSU loopback is selected at the system console. Each power supply is isolated from other circuits and supplies at least 4 mA at 7 Volts (but no more than 28 Volts at 20 mA).

DDS Loops

Cables from the DDS loops must be equipped with RJ48S compatible plugs to mate with the RJ48S jacks provided as shown in Figure 14-2. The RJ48S jacks are labeled DP 1-4 to indicate Data Port 1-4.

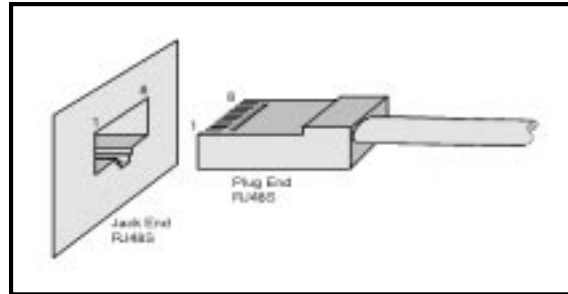


Figure 14-2. RJ48S Jack and Plug End

Each jack is wired as follows:

- 1 = Transmit out, Ring lead (sealing -)
- 2 = Transmit out, Tip lead (sealing -)
- 3 (No Connection)
- 4 (No Connection)
- 5 (No Connection)
- 6 (No Connection)
- 7 = Receive input, Tip lead (sealing +)
- 8 = Receive input, Ring lead (sealing +)

**NOTE:**

Direct connection to a CSU/DSU requires a cross over cable.

Regulatory Information

North America

The Quad OCU module complies with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the Interface Module must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Product Safety

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Europe

This equipment is in conformity with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

following the provisions of the EMC directive 89/336/EEC, and the Low voltage directive 73/23/EEC.

Before You Begin

- This chapter is written for ADMINISTRATOR-level users.
 - A slot must first be configured for the module type and the Quad OCU module must be resident in a slot in the equipment nest. (A Quad OCU interface, or rear, module must also be resident in the same numbered slot as the Quad OCU front module.) If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4 of this manual.
 - For cabling and interface requirements, see Appendix B.
-

Slot Configuration

To configure a slot for the Quad OCU module:

1. From the *DACS II AX Main Menu*, place your cursor on the *System Configuration* field and press **<Enter>**, the following menu appears:

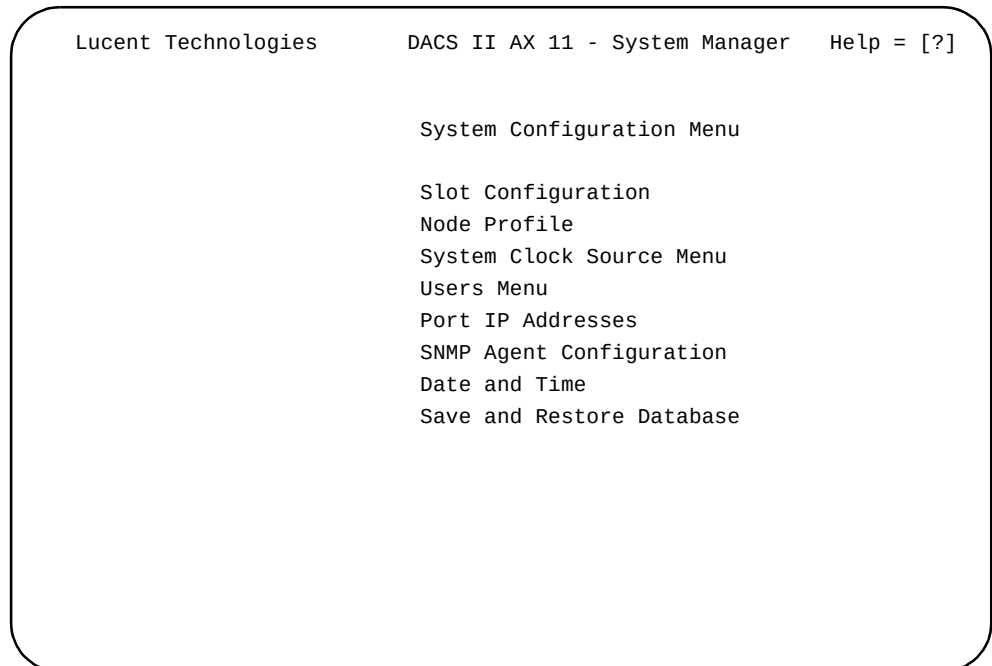


Figure 14-3. System Configuration Menu

1. Press **<Enter>** at the *Slot Configuration* field. The *Slot Configuration Menu* appears displaying slots numbered from 1 to 4 (DACS II AX-4) or 1 to 11 (DACS II AX-11).

Lucent Technologies
DACS II AX 11 - System Manager
Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1	slot 1	Enable
2	Octal High Speed	slot 2	Disable
3	Octal Voice	slot 3	Disable
4	Octal T1/E1	slot 4	Enable
5	Octal Voice	slot 5	Disable
6	Octal Voice	slot 6	Disable
7	Octal T1/E1	slot 7	Enable
8	Octal Voice	slot 8	Disable
9	Quad T1	Slot 9	Disable
10	Test Access	Slot 10	Disable
11	QUAD OCU	Slot 11	Disable

N+1 Redundancy: Enable

N+1 Redundancy Switchover: Automatic

N+1 Redundancy Restore: Manual

Change Card = [Enter key]
[D]elete Card

Figure 14-4. Slot Configuration Menu

2. Move your cursor to the desired slot number, where your Quad OCU module will reside, and press **<Enter>**. The *Slot Configuration* submenu appears.

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration

Slot name: Slot 11
Card type: QUAD OCU
Redundancy: Disable

Figure 14-5. Slot Configuration Submenu

3. At the *Slot Configuration* submenu, place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number and press **<Enter>** again.
4. Move your cursor to the *Card Type* field and press **<Enter>** key until "*Quad OCU*" is displayed.
5. Press **X** to save your configuration and return to the previous menu.



NOTE:

The same procedure applies when replacing an existing card in a slot.

Delete Slot Configuration

If you opt to delete a card, remove the card first. Then press **D** (Slot Configuration Menu) and a message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel.

If you do not remove the card prior to pressing **D**, the following message appears: "-ALERT!- Can not delete a device that is present."

Quad OCU Main Menu

Access Main Menu To access the Main Menu:

1. From the *DACS II AX Main Menu*, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```
Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
Standby SMC not present          N+1 Redundancy State: Enabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#   Configured Type   Device State   Alarm
-----
01      + Octal T1/E1     Standby       None
02      Quad High Speed   Online        None
03      Octal Voice       Online        None
04      + Octal T1/E1     Online        None
05      Octal Voice       Online        None
06      Octal Voice       Online        None
07      Octal T1/E1       Online        None
08      Octal Voice       Online        None
09      Quad T1           Online        None
10      Test Access       Online        None
11      Quad OCU          Online        None
SMCA    System Manager A  Online        None
SMCB    System Manager B  Standby       None
PSX     ProtectionSwitch  Online        None

[C]lear error counts  [S]lot Cfg      [E]xpose      [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver [R]estore
```

Figure 14-6. Node Summary Menu

2. Place your cursor on the slot number where the Quad OCU module is located and press **<Enter>**. The *Quad OCU Main Menu* appears.



NOTE:

On the Node Summary Menu, the Configured Type must display "Quad OCU" and the Device State must display "On-line". If the Device State is "Off-line", an alert message is generated.

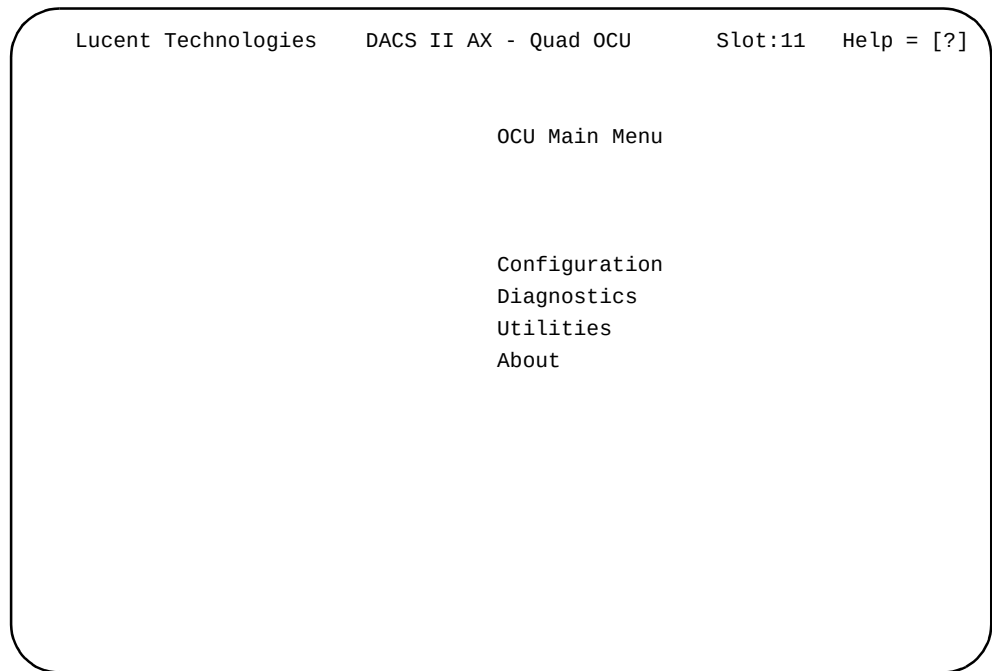


Figure 14-7. Quad OCU Main Menu

From the Quad OCU Main Menu you can configure the module, run diagnostic tests, access utilities, and display module identification (software revision levels). These procedures are detailed on the following pages.

Configuration Menu

The Quad OCU Configuration Menu provides access to the Port Configuration submenu. From here, you can configure the ports. When a Quad OCU card is replaced, the old configuration is preserved.

Configure Ports

To configure the parameters:

1. From the *Quad OCU Main Menu*, place cursor on the *Configuration* field, press **<Enter>**. The following menu appears:

Lucent Technologies		DACS II AX - Quad OCU		Slot:11 Help = [?]	
Configuration Manager					
			Clear Channel	Customer Control	
Port	Name	Data Rate	Capability	Loopback	Status

01	Circuit ID #	56 kbps	No	Yes	In Service
02	Circuit ID #	56 kbps	No	Yes	In Service
03	Circuit ID #	56 kbps	No	Yes	In Service
04	Circuit ID #	56 kbps	No	Yes	In Service

Figure 14-8. Configuration Manager Menu

The Configuration Manager Menu displays the port number, circuit ID name, data rate, channel capability, customer control loopback, and unit status.

2. To configure each of the parameters displayed in the *Configuration Manager Menu*, place the cursor at the desired port number and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX Quad OCU Slot: 11 Help = [?]

Configuration

Port.....: 1
Name.....: Circuit ID #
Data Rate.....: 56 kbps
Clear Channel Capability [valid only for 64 kbps]...: No
Customer Control Loopback[valid only for 56 kbps]...: Yes
Status.....: In Service

Figure 14-9. Configuration Submenu

3. Configure all parameters for each port number.

4. Press **X** to save changes. The following screen appears:

```
Lucent Technologies      DACS II AX - Quad OCU      Slot:11      Help = [?]  
  
Configuration  
  
Port.....: 1  
Name.....: Port *****  
Data Rate.....: 64 kb *  
Clear Channel Capabil *          -MESSAGE!-          *  
Customer Control Loop *  
Status.....: In Se *  
                *          Update configuration?          *  
                *  
                *  
                *          Are you sure (Y/N)?          *  
                *  
                *****
```

Figure 14-10. Update Configuration Screen

5. When prompted: "Update Configuration? Are you sure (Y/N)?" Type **Y**.

Configuration Menu Field Descriptions

These fields appear on the Quad OCU Configuration submenu (Figure 14-9).

Port #: The port to be configured.

Name: (text field) This is a user-defined field. Any name up to 15 alphanumeric characters in length can be entered to identify each port on the Quad OCU module. You may find it beneficial to use circuit numbers to name the ports.

Data Rate: (option field) This field displays the rate at which data is being transmitted and received. The rate will either be 64 or 56 Kbps.

Clear Channel Capability [valid only for 64 Kbps]: (option field) This field displays the channel capability. Select Yes to run a clear channel. A clear channel can only be run if the circuit does not have a ones density requirement.

Customer Control Loopback [valid only for 56 Kbps]: (option field) This field displays a customer's controlled loopback. Select Yes and the unit will pass the customer's loopback request or it will convert the loopback to Control Mode Idle (CMI).

Status: (option field) This field displays the status of the port. The status will either be In Service (i.e., active) or Out of Service (i.e., inactive).



NOTE:

Diagnostics are prevented from running on ports that are Out of Service.

Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks and built-in BERT.

There are multiple loopback options. Loopbacks can occur towards the line or towards the backplane.

The built in BERT generator and testers can be used along with loopbacks to test and determine the status of the QUAD OCU module. They may also be used in conjunction with diagnostic facilities on other DACS II AX cards to qualify operation of the backplane connections.

View Diagnostics and Configure Loop Type

To view diagnostics and configure the loop type:

1. From the *Quad OCU Main Menu*, place the cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

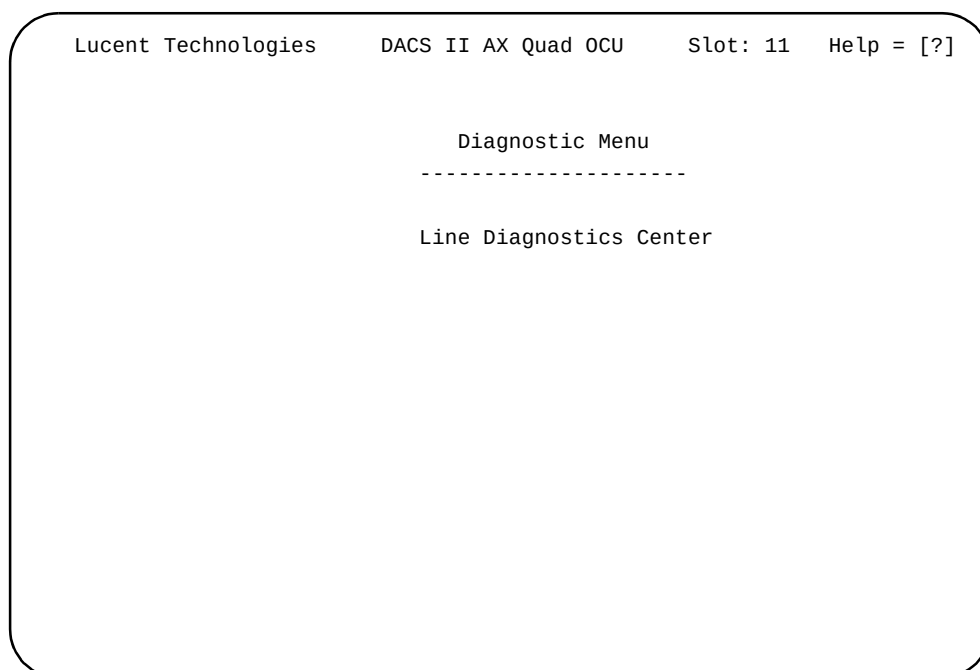


Figure 14-11. Diagnostic Menu

2. With the cursor on the *Line Diagnostics Center* field, press **<Enter>**. The following menu appears:

```

Lucent Technologies      DACS II AX Quad OCU      Slot: 11  Help = [?]

                        Diagnostic Monitor

Port.....: #1          #2          #3          #4
Name.....:Circuit ID #  Circuit ID #  Circuit ID #  Circuit ID#
Port Loop.....:Off      Off          Off          Off
Backplane Loop:Off      Off          Off          Off

Bert.....:Off          Off          Off          Off
Secs.In Test.:0          0            0            0
Local Errors.:0          0            0            0
Remote Error.:0          0            0            0

State.....:LostDDSCarrier LevelDetection LostDDSCarrier LostDDSCarrier
Bipolar Error.:Yes- 32553   Yes- 33218   Yes- 32179   Yes- 31876
Loss of Frame.:No - 0      Yes- 33218   No - 0        No - 0
LineLoss db/km:50.5/8.5    32.3/5.3    50.5/8.5      50.5/8.5

Loop: Local [A]nalog  Local [D]igital  [L]ine  [R]emote  [B]ackplane
      Loop [O]ff      [C]lear Counters  Insert [E]rror
BERT: [2]047    [5]11    [6]3    All [1]'s    All [0]'s    Of[f]

```

Figure 14-12. Diagnostic Monitor Menu

3. Place your cursor on the port number to be configured by using the **<BackSpace>/<SpaceBar>** to toggle between ports.
 4. Select the type of loopback test you would like to run by pressing the appropriate letter, as indicated in the brackets, located at the bottom of the menu. For a description of the loopbacks, refer to Table 14-1 Loopback Test Descriptions.
 5. The message, "Put (the port number you choose) in (the type of loopback you choose). Are you sure (Y/N)?" appears. Press **Y** to save configuration and enable loop or press **N** to cancel action and return to the *Diagnostic Monitor Menu*.
-

Configure BERT

To configure BERT:

1. Place your cursor on the port number to be configured by using the **<BackSpace>/<SpaceBar>** to toggle between ports.
2. Select the type of BERT pattern you would like to run by pressing the appropriate number, as indicated in the brackets, located at the bottom of the menu.

**NOTE:**

The BERT field will automatically change as an option number is pressed.

3. When done, turn the BERT pattern off, by typing **f**.
-

Diagnostics Monitor Field Descriptions

The following fields are read-only and can be monitored when you select a specific loopback test or BERT test from the Quad OCU Diagnostics Monitor menu (Figure 14-12).

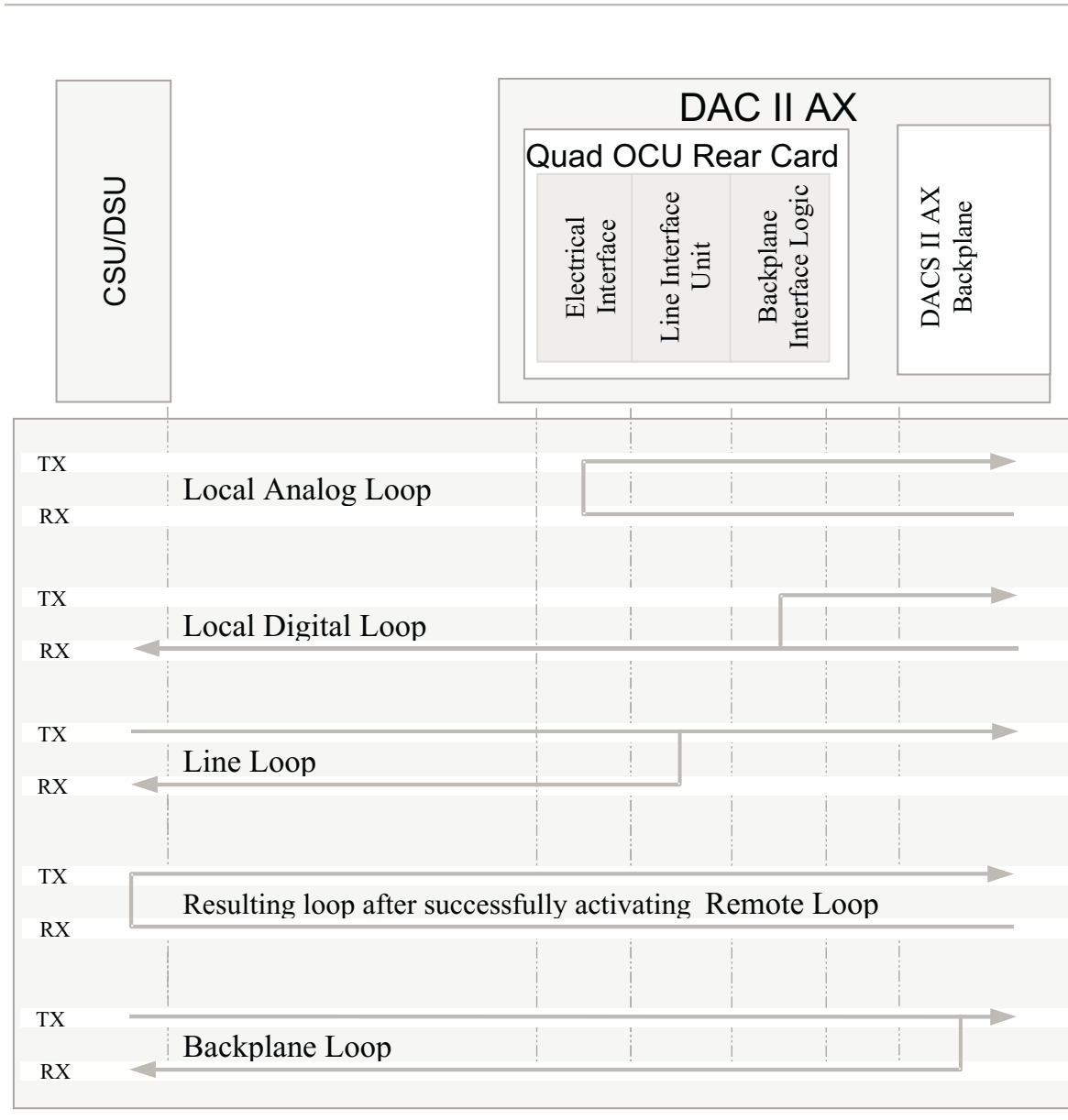
Port: The port to be configured.

Name: This field displays the name of each port on the Quad OCU.

Port Loop: This field displays what type of loop is running in a port. See the following table for loop selections. Figure 14-13 shows the data flow of the loop selections.

Table 14-1. Loopback Test Descriptions

Loop selections	Description
Local Analog Loopback	Breaks the DDS line toward the CSU/DSU and loops back data from the backplane. Loopback occurs at the QOCU rear interface module's electrical interface.
Local Digital Loopback	QOCU's backplane interface logic loops data from the backplane in the Xilinx FPGA Serial Interface Integrated Circuit (IC). Data is also sent towards the CSU/DSU and is optionally available for monitoring.
Line Loopback	Loops back DDS line towards the CSU/DSU. Important: For Line Loop to work properly, the CSU/DSU must be set for Internal Timing.
Remote Loopback	Puts the attached CSU in Line Loop. Data from the QOCU is looped back towards itself. This loopback is activated by reversing the sealing current between Tx and Rx pairs when selected at the console. Remote loopback occurs when the Rx pair is negative and the Tx pair is positive.
Backplane Loopback	Data from the CSU/DSU goes through the QOCU, reaches the backplane and is looped back to the CSU/DSU. Data from the CSU/DSU also continues across the backplane to its destination and is optionally available for monitoring.
Off	No loops selected.

**Figure 14-13. Quad OCU Loops**

BERT: This is useful for testing for errors on the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality. The option will either be 2047, 511, 63, All 1's, All 0's or Off.

Secs. (Seconds) in Test: Count representing the number of seconds the Quad OCU module was in test.

Local Errors: Count representing the number of local errored seconds that occurred in a one second period while the QOCU module was in test. These are errors detected on BERT pattern from an external device connected to a port on the QOCU rear card.

Remote Errors: Count representing the number of remote errored seconds that occurred in a one second period while the QOCU module was in test. These are errors detected on BERT pattern from devices that interface with the QOCU via the DACS II AX backplane.

State: This field indicates the signal state of the DDS line. The state will either be RcvrSignal Good, Lost DDS Carrier, Out of Service or Level Detection.

Bipolar Error: This field displays if a signal polarity error is detected on the DDS line.

Loss of Frame: A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5 or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

LineLoss db/km: The received line level loss is displayed in decibels and the equivalent line length is indicated.

COMMANDS

[C]lear Counters: Clears all counters for the selected port.

Insert [E]rror: For test purposes, inserts BERT errors.

Utilities Menu

**WARNING:**

It is strongly suggested that you do not use the Utilities menu options unless prompted to do so by a Lucent Technologies technical support representative.

Access Utilities

To access the Utilities:

1. From the *Quad OCU Main Menu*, place the cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

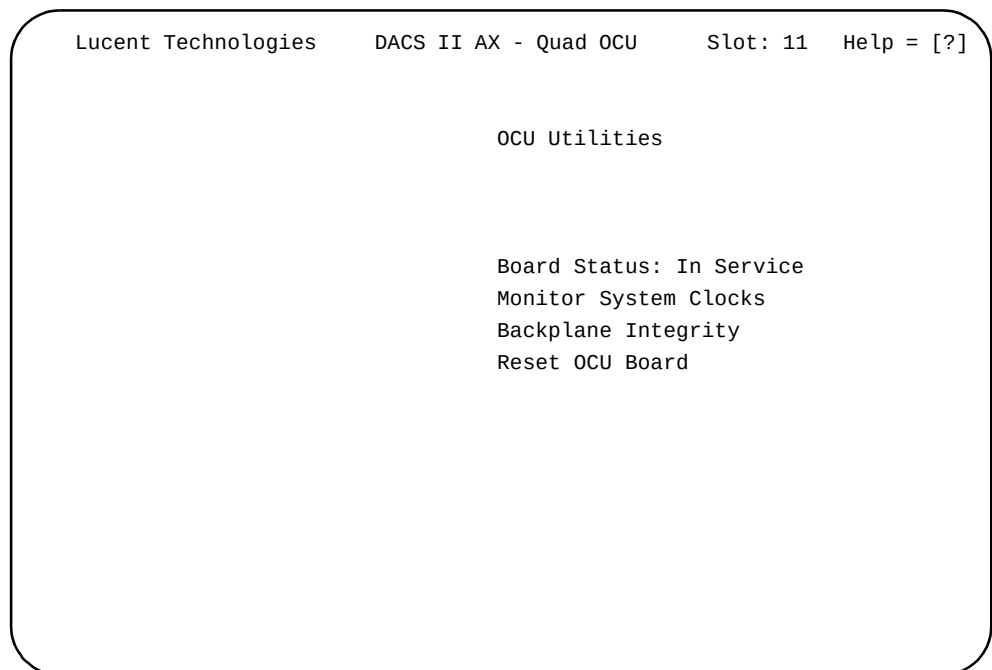


Figure 14-14. Quad OCU Utilities Menu

Set Board Status to In Service

The Board Status screen allows the Administrator to put a port in service or out of service.

To set the board status: to in-service:

1. On the *OCU Utilities* menu, place the cursor on the *Board Status: In Service* field, press **<Enter>**. The following screen appears:

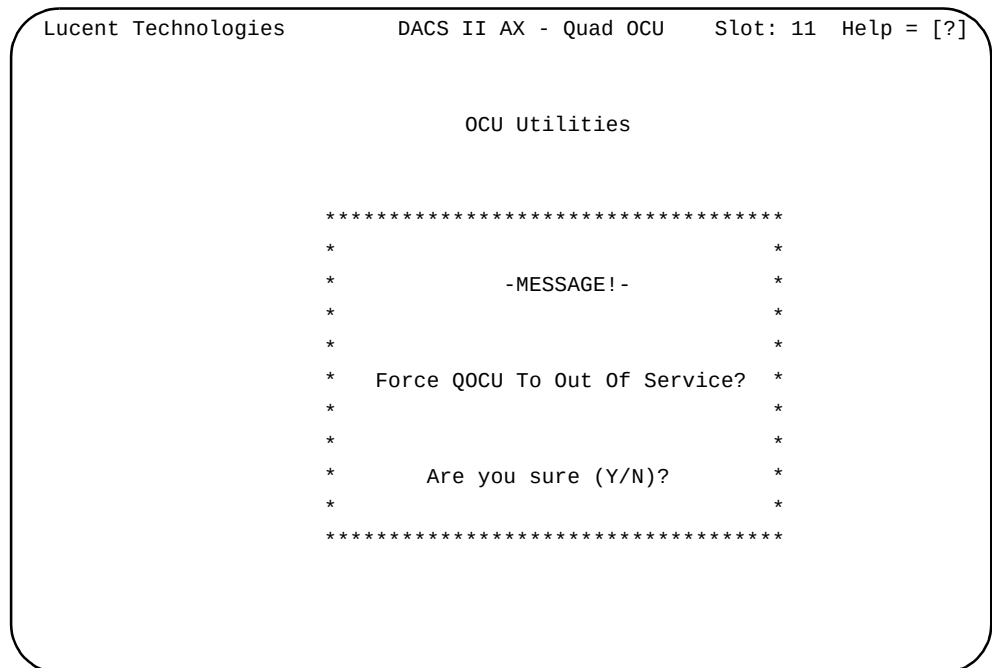


Figure 14-15. Board Status Screen

2. Press **Y** to force Quad OCU Out of Service or press **N** to return to the *Utilities Menu*.

**NOTE:**

The LEDs continuously cascade down the bezel when the Quad OCU module is set to Out of Service.

**Change Board
Status to In Service**

To change the Board Status to In Service:

1. From the *Quad OCU Utilities Menu*, select the *Board Status - Out of Service* field and press **<Enter>**. The following screen appears:

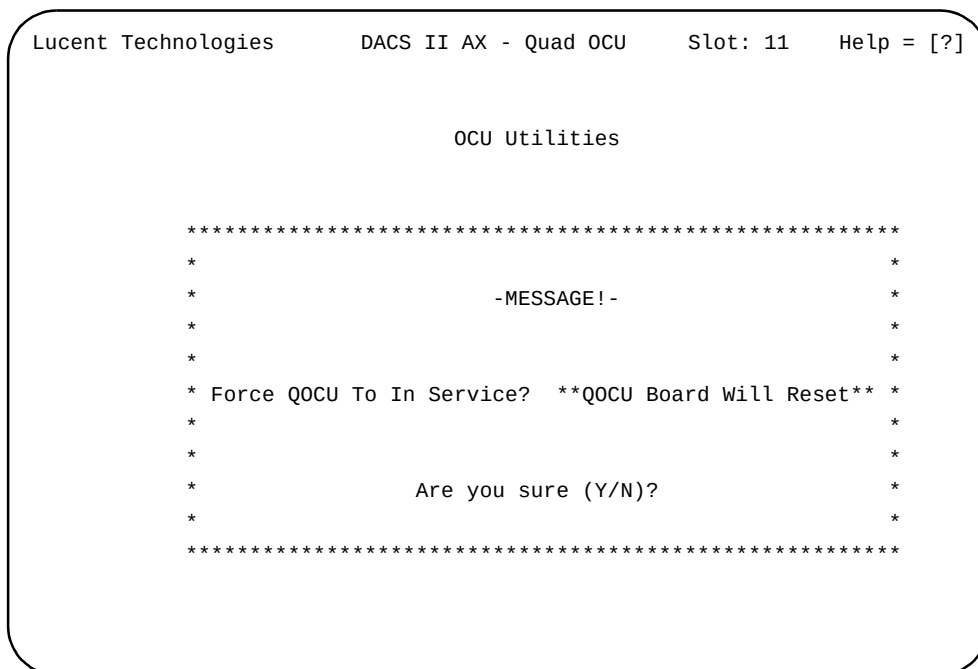


Figure 14-16. Out of Service Board Status Screen

2. Press **Y** to reset Board Status to In Service. The message, "Reset this QOCU Board? Are you sure (Y/N)?" appears. Press **Y** and the message "Alert! Please wait while we establish communications with the system manager! Press any key to continue." appears.
3. Press **N** to leave the Board Status as Out of Service.

**NOTE:**

Upon pressing any key, all LEDs illuminate. It takes approximately 10-20 seconds for the Quad OCU board to reset. The Node Summary Menu appears with a configuration status of On-line after which all LEDs will cascade down the bezel to indicate the Quad OCU board has reset.

**View System
Clocks**

This view-only screen displays the status of the Bus, lost system clock count, and lost frame sync count.

**NOTE:**

The fields shown in this menu are the default settings and should not be accessed or configured; they are for debugging purposes only.

To view the System Clocks:

1. From the *Quad OCU Utilities Menu*, place the cursor on the *Monitor System Clocks* field and press **<Enter>**. The following screen appears:

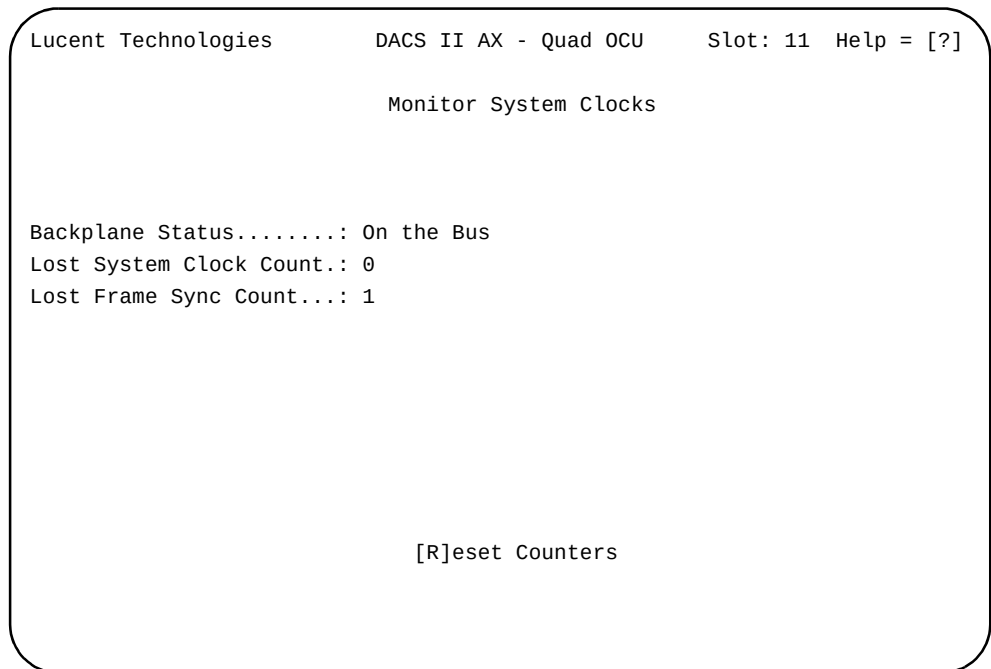


Figure 14-17. Monitor System Clocks Screen

2. To reset the counters press **R**.
3. To return to the *Utilities Menu* press **X**.

View Backplane Integrity

The View the Backplane Integrity is a view-only screen that displays the status of the DACS II AX backplane.

The fields shown in this menu are the default settings and should not be accessed or configured; they are for debugging purposes only.

To view the Backplane Integrity:

1. From the *Quad OCU Utilities Menu*, place the cursor on the *Backplane Integrity* field and press **<Enter>**. The following screen appears:

Lucent Technologies		DACS II AX - Quad OCU		Slot: 11 Help = [?]	
Monitor Backplane Integrity					
Slot #	Slot #	Slot #	Pattern	Patt.	Status
-----	Address	Received	Address	Rcv	(Ignore for QHS)
Slot #1	0x00205007	01	0x00205008	03	... OK ...
Slot #2	0x00205009	02	0x0020500a	00	... OK ...
Slot #3	0x0020500b	03	0x0020500c	04	... OK ...
Slot #4	0x0020500d	06	0x0020500e	06	
Slot #5	0x0020500f	06	0x00205010	06	
Slot #6	0x00205011	06	0x00205012	06	... OK ...
Slot #7	0x00205013	06	0x00205014	06	
Slot #8	0x00205015	06	0x00205016	06	
Slot #9	0x00205017	06	0x00205018	06	
Slot #10	0x00205019	06	0x0020501a	06	
Slot #11	0x0020501b	06	0x0020501c	06	

Figure 14-18. Monitor Backplane Integrity Screen

2. To return to the *Utilities Menu* press **X**.

Monitor Backplane Integrity Field Descriptions

These fields appear on the Monitor Background Integrity screen (Figure 14-18).

Slot #: Displays the slot number in the backplane. The DACS II AX-4 will have 4 slots displayed while the DACS II AX-11 will have 11 slots displayed.

Slot # Address: Displays the hexadecimal address of the slot in the backplane.

Slot # Received: Displays the received slot number (hexadecimal).

Pattern Address: Displays the hexadecimal address of the pattern.

Pattern Received: A pattern is being received that indicates the status of the backplane connection. A received pattern of 00 causes "OK" status to be indicated in the *Status* field.

Status (ignore for QHS): Shows the status of the slot's connection to the backplane.

Reset Device

This utility causes the card to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC, connections will be restored.

To reset the device:

1. From the *Quad OCU Utilities Menu*, place the cursor on the *Reset OCU Board* field and press **<Enter>**. The following screen appears:

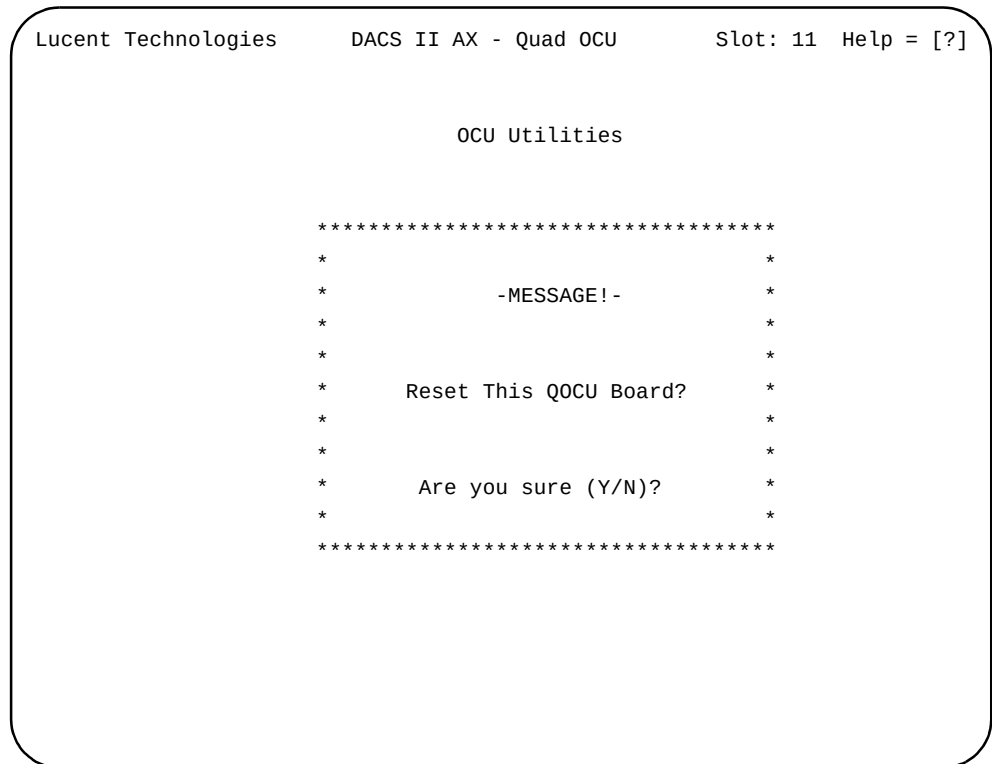


Figure 14-19. Reset QOCU Board

2. Press **Y** to reset device. The message, "Alert! Please wait while we establish communications with the system manager! Press any key to continue." appears.
3. Press **N** to return to the Utilities Menu. Press any key to reset the board.

**NOTE:**

Upon pressing any key, all LEDs illuminate. It takes approximately 10-20 seconds for the Quad OCU board to reset. The Node Summary Menu appears with a configuration status of On-line after which all LEDs will cascade down the bezel to indicate the Quad OCU board has reset.

About Menu

The Quad OCU About Menu is a view only screen that displays the Version, Release Date, Checksum, Front Card Xilinx Version, Rear Card Type, Rear card Revision, Rear Card Xilinx Version and RAM Access.

Display Identification Information

To display identification information:

1. From the *Quad OCU Main Menu*, place the cursor on the *About* field and press **<Enter>**. The following screen appears:

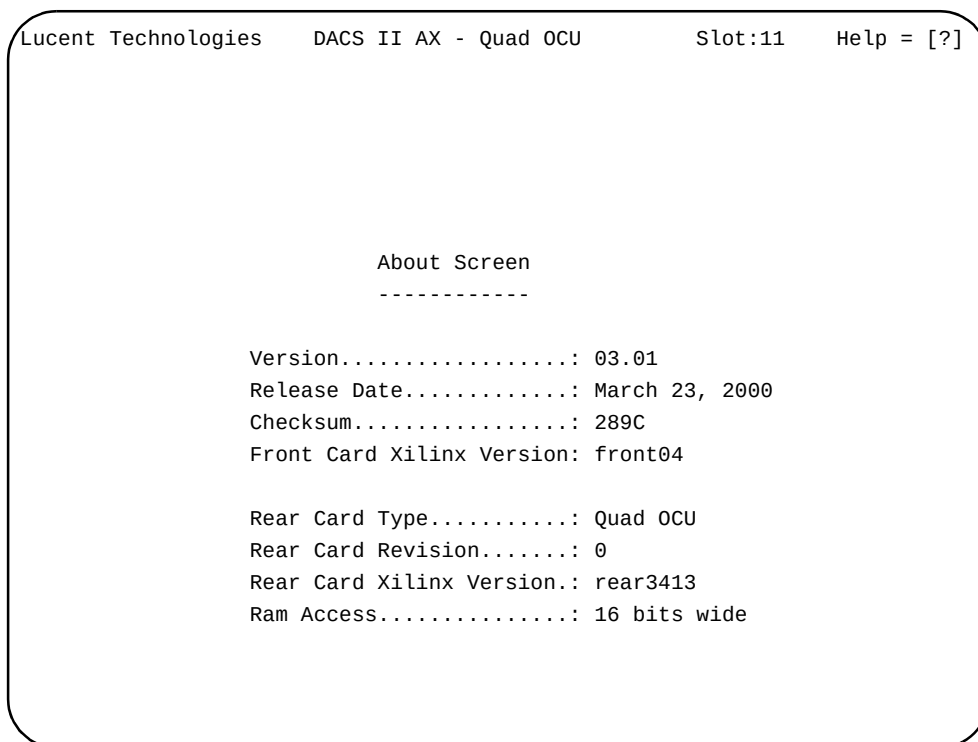


Figure 14-20. Quad OCU About Screen

About Menu Field Descriptions

These fields appear on the Quad OCU About screen (Figure 14-20).

Version: Displays the software version currently residing in the Quad OCU's flash memory.

Release Date: Displays the date of module software release.

Checksum: Displays the sum of all bytes in the Quad OCU's flash memory at power up. Also used to identify software version.

Front Card Xilinx Version: Displays the hardware version of downloadable, programmable devices.

Rear Card Type: Displays the type of interface module in the system.

Rear Card Revision: Displays the interface module's revision level.

Rear Card Xilinx Version: Displays the hardware version of downloadable, programmable devices.

RAM Access: The size of the memory bits.

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Physical Description

The Quad DS-1 Application with xDSL Module Set contains four DS-1 links, a microprocessor, and FLASH memory for program storage.

There are four sets of LEDs, one set for each trunk, and an ERROR LED located on the Quad DS-1 application module.

- **ALARM** - red indicates an alarm condition has occurred on the trunk.
- **LOOP** - yellow indicates a loopback condition has occurred on the trunk.
- **TEST** - green indicates a 2047 test pattern only.
- **ERROR** - red indicates an error condition exists for this module.

If all LEDs flash simultaneously, this indicates the module has been forced out of service or no rear card is present.

The High-bit-rate Digital Subscriber Line (HDSL) enables the transport of T-1 or Fractional T-1 data over one or two pairs of unconditioned copper with speeds of 1.544 in both directions. The Symmetric Digital Subscriber Line (SDSL) interface facilitates data movement at 768 Kbps in both directions.

When used with a Quad DS-1 module, the xDSL card fits into the rear of the Quad DS-1 module, via the DACS II AX, to extend the length of the T-1 line. The xDSL module has the same form factor as the Quad DS-1 rear card and can be implemented without any changes to the DACS II AX system or Quad DS-1 card. The xDSL module can contain up to four mini modules in any combination of Full T-1 or Fractional T-1.

Thumb screws are provided at the top and bottom of the bezels to secure the module in the chassis and to make an electrical connection to frame ground for FCC emission compliance. The electrical connection to frame ground also protects the module from static discharge.

➤ **NOTE:**
The N + 1 Protection Switch does not supply redundancy for the Quad DS-1 with xDSL module set.

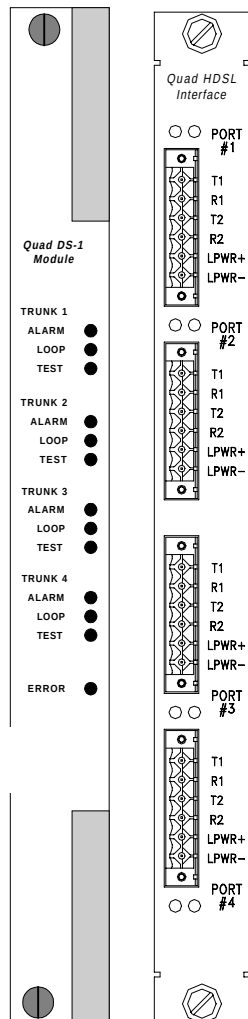


Figure 15-1. Quad DS-1 Application with xDSL Interface Module Set

Regulatory Information

North America

The Quad DS-1 with xDSL Module is designed to comply with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the rear card must be secured to the chassis by means of firmly tightening securing screws on the bezel

This Class A digital apparatus is designed to meet all requirements of the Canadian Interference Causing Equipment Regulations.

Product Safety

This equipment is designed to meet the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Before You Begin

- This chapter is written for ADMINISTRATOR-level users.
 - A slot must first be configured for the module type and the Quad DS-1 with xDSL Interface Module must be resident in a slot in the equipment nest. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4 of this manual.
 - Be sure to note which slot the Quad DS-1 with xDSL Interface Module resides. The Node Summary Main Menu does not differentiate between the standard Quad DS-1 Application/Interface Module and Quad DS-1 Application with xDSL Interface Module. You must enter the device and view the Main Menu to determine which module contains the xDSL submenus.
 - For cabling and interface requirements, see Appendix B.
 - DACS II AX Quad T1, as displayed in the menus through out this text, is the same as DACS II AX Quad DS-1. In addition, DSL or HDSL is the same as xDSL.
-

Slot Configuration

To configure a slot for the Quad DS-1 Module:

1. From the DACS II AX Main Menu, place your cursor on the *System Configuration* field and press **<Enter>**, the following menu appears:

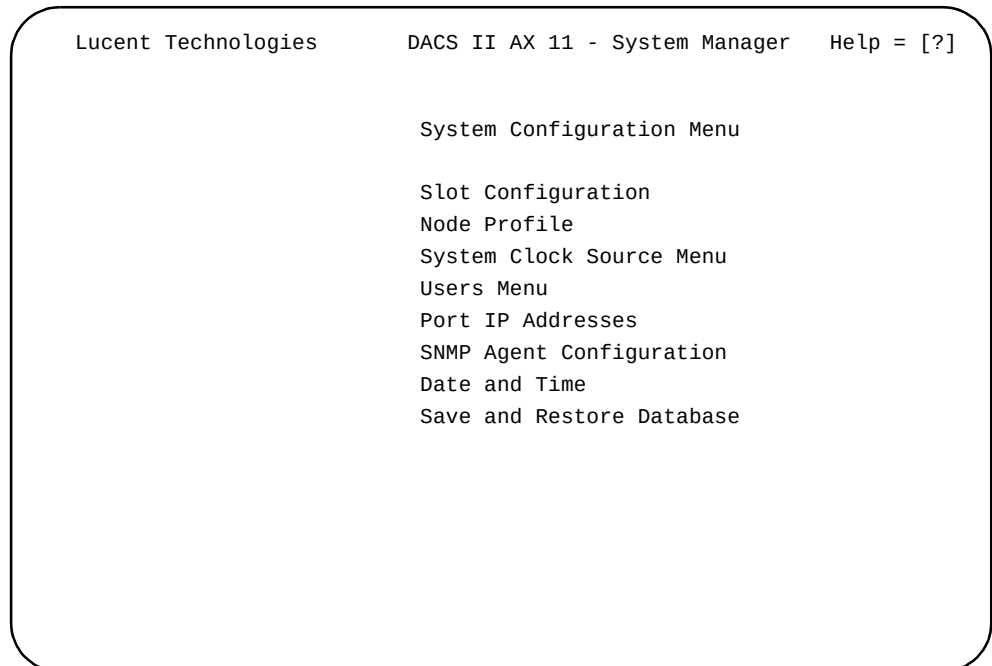


Figure 15-2. System Configuration Menu

2. Press **<Enter>** at the *Slot Configuration* field. The *Slot Configuration* menu appears displaying slots numbered from 1 to 4 (DACS II AX-4) or 1 to 11 (DACS II AX-11).

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
----	-----	-----	-----
1	Octal T1/E1	slot 1	Enable
2	Octal High Speed	slot 2	Disable
3	Octal Voice	slot 3	Disable
4	Octal T1/E1	slot 4	Enable
5	Octal Voice	slot 5	Disable
6	Octal Voice	slot 6	Disable
7	Octal T1/E1	slot 7	Enable
8	Octal Voice	slot 8	Disable
9	Quad T1	Slot 9	Disable
10	Test Access	Slot 10	Disable
11	QUAD OCU	Slot 11	Disable

N+1 Redundancy: Enable
N+1 Redundancy Switchover: Automatic
N+1 Redundancy Restore: Manual

Change Card = [Enter key] [D]elete Card

Figure 15-3. Slot Configuration Menu

3. Place your cursor on the desired slot number, where your Quad DS-1 module will reside, and press **<Enter>**. The *Slot Configuration* submenu appears.

The screenshot shows a terminal window titled "Lucent Technologies" and "DACS II AX 11 - System Manager" with a "Help = [?]" option. The main menu is "Slot Configuration". Below it, the following information is displayed:

```
Slot name: Slot 9
Card type: Quad T1
Redundancy: Disable
```

Figure 15-4. Slot Configuration Submenu

4. At the *Slot Configuration* submenu, place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name and number and press **<Enter>** again.
5. Move your cursor to the *Card Type* field and press **<Enter>** key until "*Quad T1*" is displayed.
6. Press **X** to save your configuration and return to the previous menu.



NOTE:

The same procedure applies when replacing an existing card in a slot.

**Delete Slot
Configuration**

If you opt to delete a card, remove the card first. Then press **D** (Slot Configuration Menu) and a message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel.

**NOTE:**

If you do not remove the card prior to pressing **D**, the following message appears: "-ALERT!- Can not delete a device that is present."

Main Menu

Procedure

To access the Main Menu:

1. From the *DACS II AX Main Menu*, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
Standby SMC not present      N+1 Redundancy State: Enabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#  Configured Type  Device State  Alarm
-----
01     +Octal T1/E1     Standby      None
02     Quad High Speed  Not Present  None
03     Octal Voice      Not Present  None
04     +Octal T1/E1     Not Present  None
05     Octal Voice      Not Present  None
06     Octal Voice      Not Present  None
07     Octal T1/E1      Online       None    Clock Src
08     Octal Voice      Online       None
09     Quad T1          Online       None
10     Test Access      Online       None
11     Quad OCU         Online       None
SMCA   System Manager A Online       None
SMCB   System Manager B Not Present  None
PSX    ProtectionSwitch Online       None

[C]lear error counts  [S]lot Cfg      [E]xpose  [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver  [R]estore

```

Figure 15-5. Node Summary Menu

2. Place your cursor on the slot number where the Quad DS-1 with xDSL interface module is located and press **<Enter>**. The *Quad DS-1 Main Menu* appears.

3. On the Node Summary Menu, the Configured Type must display "Quad DS-1" and the Device State must display "On-line". If the Device State is "Off-line", an alert message is generated.

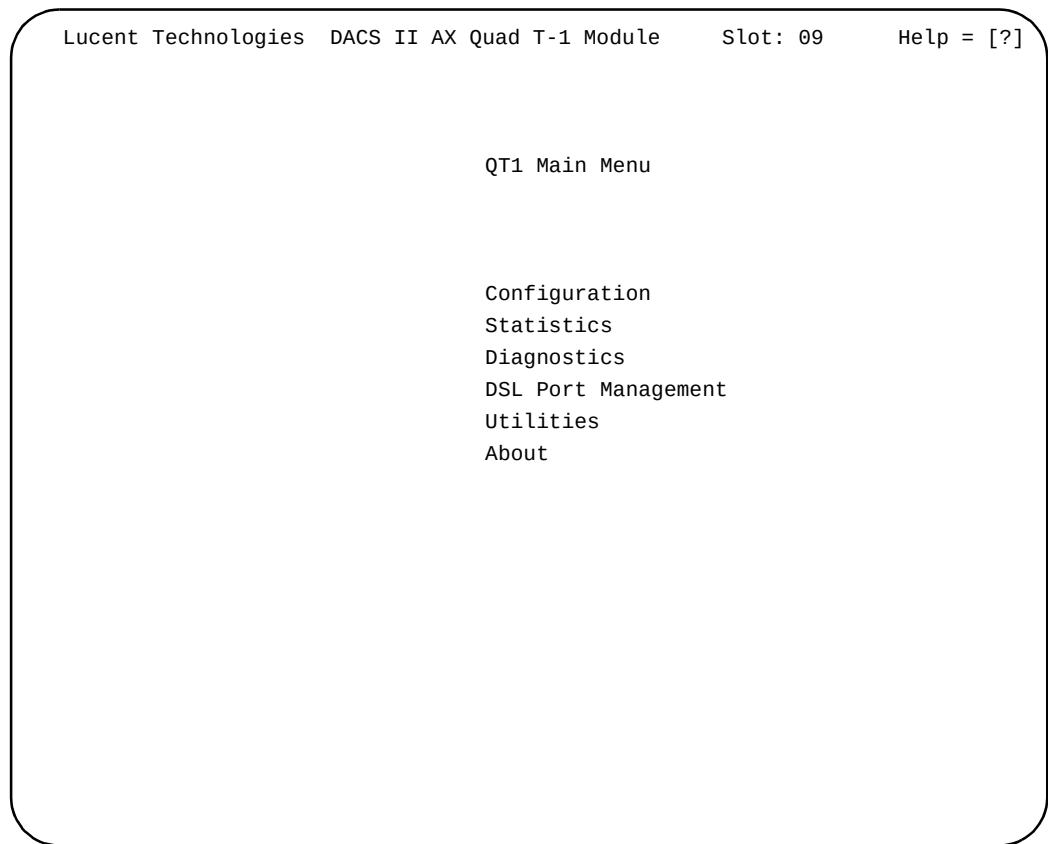


Figure 15-6. Quad DS-1 Main Menu with DSL Port Management

From the Quad DS-1 Main Menu you can configure the module, display statistics, run diagnostic tests, manage ports, access utilities, and display module identification (software revision levels). These procedures are detailed on the following pages.

Configuration Menu

The Quad DS-1 with xDSL Configuration Menu provides access to the Port Configuration submenu. From here, you can configure the ports. When a Quad DS-1 card is replaced, the old configuration is preserved.

Procedure

To configure the ports:

4. From the *Quad DS-1 Main Menu*, place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

Lucent Technologies
DACS II AX Quad T-1 Module
Slot: 09
Help = [?]

Quad T-1 card port configuration

	Port #1	Port #2	Port #3	Port #4
Name.....	Port #1	Port #2	Port #3	Port #4
Framing.....	ESF	ESF	ESF	ESF
Line code....	B8ZS	B8ZS	B8ZS	B8ZS
LB0.....	0 db	0 db	0 db	0 db
Density.....	Clear	Clear	Clear	Clear
Ntwk loops...	Enable	Enable	Enable	Enable
Yellow alarm:	Yes	Yes	Yes	Yes
ESF format...	54016	54016	54016	54016
Unused DS0's:	Busy	Busy	Busy	Busy
Port Status :	In Service	In Service	In Service	In Service
HDSL Unit....	Master	Master	Master	Master
Cascade Leds when Idle:	Yes			

Figure 15-7. Quad DS-1 Card Port Configuration Menu



NOTE:

Configuration parameters are determined by your local carrier.

5. To change the configuration of a particular port, move your cursor to the field to be configured and press **<Enter>** to toggle between the field's options. Refer to the port configuration field descriptions that follow.
6. Press **X** to save changes. The following screen appears:

```

Lucent Technologies          DACS II AX - Quad T1          Slot:09    Help = [?]

                                Quad T1 Card Port Configuration

      Port #1          Port #2          Port #3          Port #4
Name.....: Port #1
Framing.....: D4          ***** ESF
Line code...: AMI          * B8ZS
LB0.....: 0 db          * -MESSAGE!- 0 db
Density.....: Clear          * Clear
Ntwk loops...: Enable          * Enable
Yellow alarm: Yes          * Update configuration? Yes
ESF format...: T1.403          * 54016
Unused DS0's: Busy          * Busy
Port Status : In Serv          * Are you sure (Y/N)? In Service
HDSL Unit...: Master          * Master
Cascade Leds when Idl *****
  
```

Figure 15-8. Update Configuration Screen

7. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y** to save your changes or press **N** to cancel changes and return to the *Quad DS-1 Main Menu*. Either selection returns you to the *Quad DS-1 Main Menu*.

Port Configuration Field Descriptions

Port #: The port to be configured.

Name: (text field) This is a user-defined field. Any name up to 14 alphanumeric characters in length can be entered to identify each port on the DACS II AX Quad DS-1 with xDSL module. You may find it beneficial to use circuit numbers to name the ports.

Framing: (option field) This information must be obtained from the network supplier. Choose either D4 or ESF.

D4 (Super Frame): D4 (SuperFrame) consists of 12 frames of 193 bits each for a total of 2316 bits. Each 193rd bit frame consists of 192 bits preceded by one framing bit (the F bit).

ESF (Extended Super Frame): ESF (Extended SuperFrame) includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

Line Code: (option field) This information must be obtained from the network supplier. Choose between AMI (Alternate Mark Inversion) and B8ZS (Bipolar with 8 Zero Substitution).

LBO (Line Build Out): (option field) This parameter should be set to 0 dB unless the network supplier specifically requests otherwise. The options are 0, 7.5, 15 or 22 dB.

Density: (option field) This information must be obtained from the network supplier. Choose Clear or 62411. A "Clear" network imposes no "ones density" requirements on the user. A "62411" network complies with AT&T Technical Reference # 62411 and limits the DACS II AX Quad DS-1 module transmission to no more than fifteen consecutive zeroes. If the Line Code entry is "B8ZS", choose "Clear". If the Line Code entry is "AMI", choose 62411.

Network Loops: (option field) This entry determines the DACS II AX Quad DS-1 module's ability to respond to diagnostic commands received from the network supplier. Choose Enable or Disable. Select Disable so that the commands are passed to another DS-1 device that will respond.

Yellow Alarm: (option field) Choose Yes or No. Yes causes the DACS II AX Quad DS-1 module to discard data and send a "yellow alarm" if it is in a "red alarm" condition for three seconds. Yes must be chosen if the network supplier is a common carrier, such as a telephone company.

ESF Format: (option field) This entry describes the types of ESF network commands that the DACS II AX DS-1 module will respond to. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between AT&T Technical Reference 54016 and ANSI specification T1.403.

Unused DS0s: (option field) This selection determines whether the data that will be transmitted over the unused DS0s. Check with your network provider for the correct data code. Choose IDLE or BUSY.

Port Status: (option field) This field determines the status of the port. The status will either be In Service or Out of Service.

HDSL Unit: (option field) Master and Slave are the two options for an xDSL span. As a master it provides clock to the far end slave unit. As a slave unit it accepts clock from the far end master unit. Be sure to set system clocking to this port. It is recommended that this field be set to Master. It will then obtain its clock from the DACS II AX backplane.

Cascade LEDs when idle: Blinking LEDs that indicate the board is working but it is in idle mode.

Statistics Menu

The Statistics Menu exposes the ESF Statistics and ESF Registers.

The ESF Statistics submenu displays both current and 24-hour ESF statistics. The Current Statistics column displays the counts for the current time interval (maximum fifteen minutes). The 24-hour Statistics column displays the counts for the preceding 24-hour period.

The ESF Registers submenu gives the same information as the ESF Statistics Menu but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

Display ESF Statistics

To view the ESF Statistics Menu:

1. From the *Quad DS -1 Main Menu*, place your cursor on the *Statistics* field and press **<Enter>**. The following menu appears:

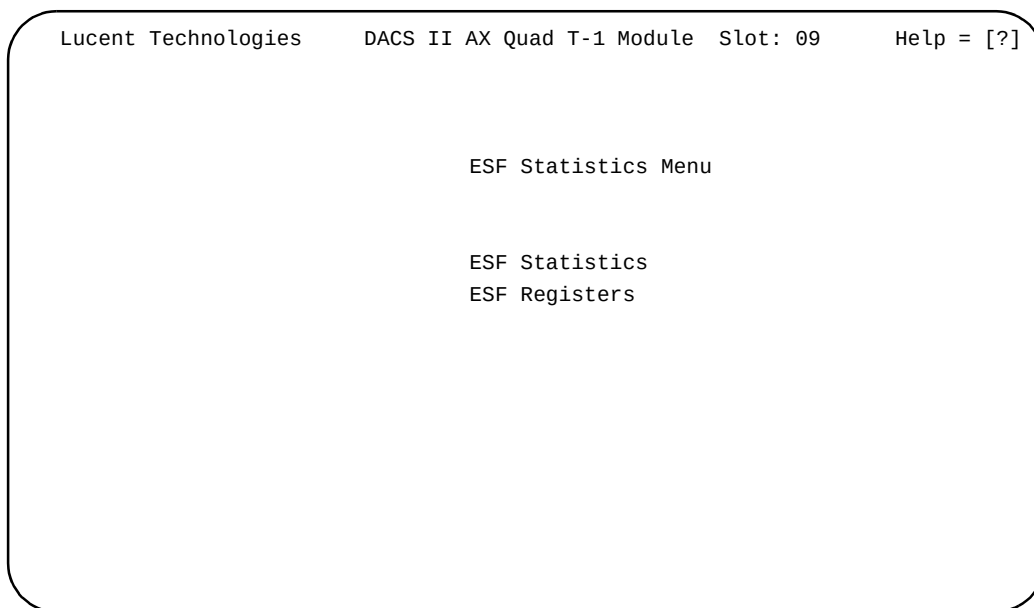


Figure 15-9. ESF Statistics Menu

2. Place your cursor on the *ESF Statistics* field and press **<Enter>**. The following screen appears:

Lucent Technologies		DACS II AX Quad T-1 Module				Slot: 09		Help = [?]	
Quad T-1 ESF statistics									
Register	Port #1		Port #2		Port #3		Port #4		
	Curr 24Hr		Curr 24Hr		Curr 24Hr		Curr 24Hr		
Errored seconds.....:0	1	0	0	0	0	0	0	0	
Failed seconds (UAS)....:420	63889	0	0	0	0	0	0	0	
Severely errored seconds:0	1	0	0	0	0	0	0	0	
Bursty errored seconds...:0	0	0	0	0	0	0	0	0	
Loss of frame count.....:0	1	0	0	0	0	0	0	0	
Time in interval.....:420		420		420		420		420	
# Valid intervals.....:71		71		71		71		71	
ESF status.....:FU000000		FU000000		FU000000		FU000000		FU000000	

Figure 15-10. ESF Statistics Screen

3. To exit or return to the previous menu, press **X** or press **Esc**.

The ESF Statistics display is a read-only screen. It allows you to view both current and 24-hour ESF statistics. The Current Statistics column displays the counts for the current time interval (maximum 15 minutes). The 24-hour Statistics column displays the counts for the preceding 24-hour period.

ESF Statistics Field Descriptions

Errored Second (ES): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed Second (FS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred.

Severely Errored Second (SES): A one-second period in which 320 or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty Errored Second (BES): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Loss of Frame Count: A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time In Interval: A timer that tracks the number of seconds in one 15-minute interval.

of Valid Intervals: A counter that tracks the total number of 15 minute intervals in a 24-hour period (up to 96).

ESF Status: This field defines the status of the T1 line. The status is defined by an eight digit number that is described below:

FU0000L0

Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.

Digit #2 - "U" or "0" where "U" indicates an unavailable signal state.

Digit #3 through #6 and #8 are always "0."

Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.

Display ESF Registers

To view the ESF Registers Menu:

1. From the *Quad DS-1 Main Menu*, place your cursor on the *Registers* field and press **<Enter>**. The following menu appears:

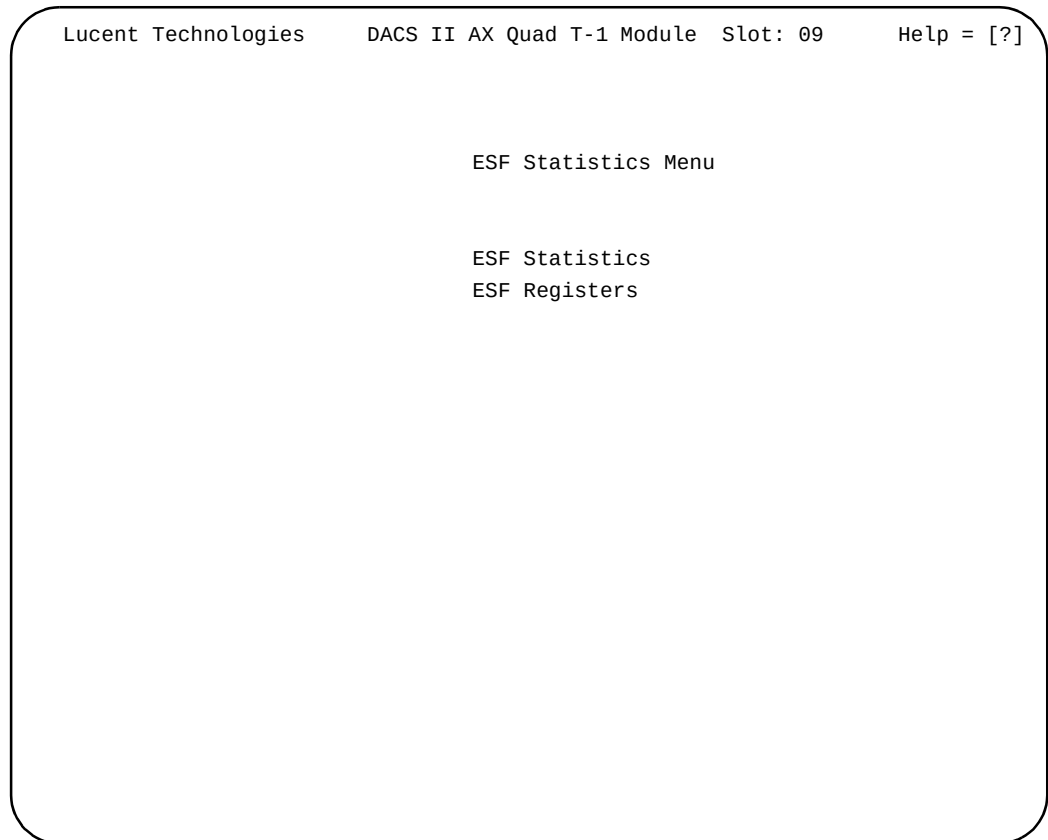


Figure 15-11. ESF Statistics Menu

2. Place the cursor on the *ESF registers* field and press **<Enter>**. The following submenu appears:

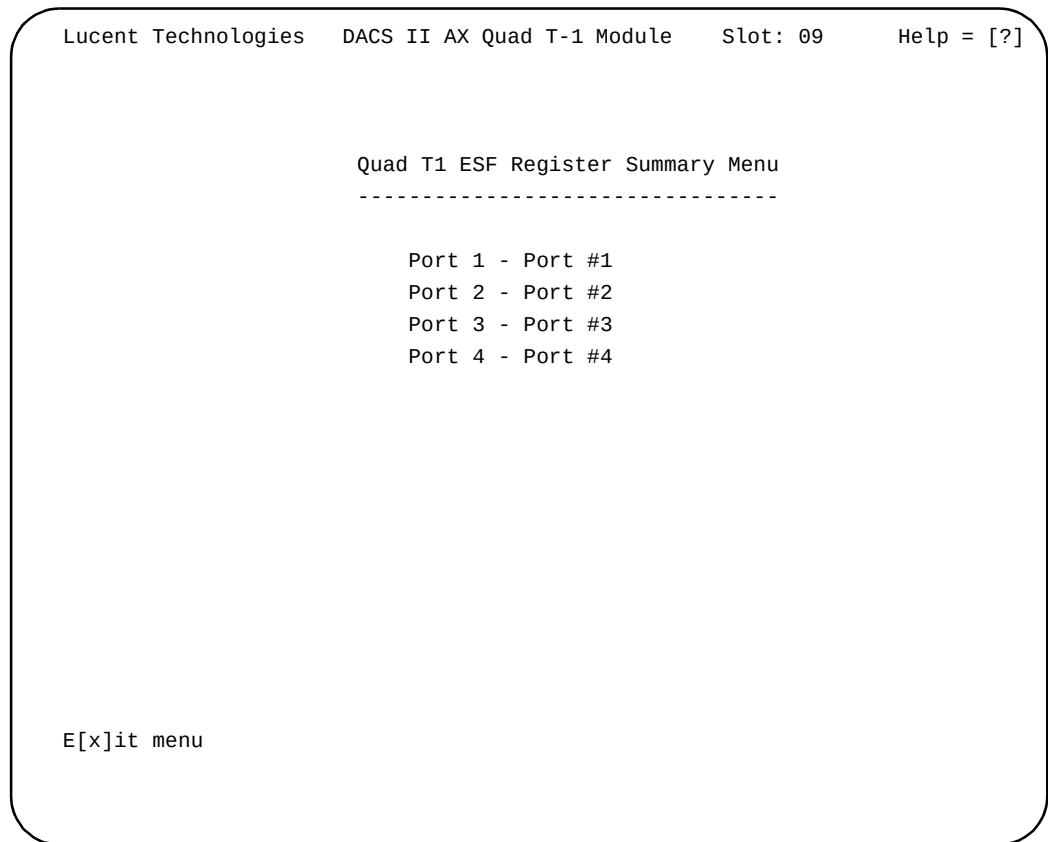


Figure 15-12. ESF Registers Summary Submenu

3. Place the cursor on any port number and press **<Enter>**. The following screen appears:

Lucent Technologies

DACS II AX Quad T-1 Module

Slot: 09

Help = [?]

ESF Registers

Port #1

INT	ES	FS	SES	BES	INT	ES	FS	SES	BES	INT	ES	FS	SES	BES
01.	000	000	000	000	17.	000	000	000	000	33.	000	000	000	000
02.	000	000	000	000	18.	000	000	000	000	34.	000	000	000	000
03.	000	000	000	000	19.	000	000	000	000	35.	000	000	000	000
04.	000	000	000	000	20.	000	000	000	000	36.	000	000	000	000
05.	000	000	000	000	21.	000	000	000	000	37.	000	000	000	000
06.	000	000	000	000	22.	000	000	000	000	38.	000	000	000	000
07.	000	000	000	000	23.	000	000	000	000	39.	000	000	000	000
08.	000	000	000	000	24.	000	000	000	000	40.	000	000	000	000
09.	000	000	000	000	25.	000	000	000	000	41.	000	000	000	000
10.	000	000	000	000	26.	000	000	000	000	42.	000	000	000	000
11.	000	000	000	000	27.	000	000	000	000	43.	000	000	000	000
12.	000	000	000	000	28.	000	000	000	000	44.	000	000	000	000
13.	000	000	000	000	29.	000	000	000	000	45.	000	000	000	000
14.	000	000	000	000	30.	000	000	000	000	46.	000	000	000	000
15.	000	000	000	000	31.	000	000	000	000	47.	000	000	000	000
16.	000	000	000	000	32.	000	000	000	000	48.	000	000	000	000

Next/previous page = [Return/Space]

Figure 15-13. ESF Registers Screen

The ESF Registers display is a read-only display. Press the **<Enter>** key or **<SpaceBar>** to view the next set of intervals.

ESF Registers Field Descriptions

INT (Interval): This column represents the interval number for ninety-six separate 15-minute intervals preceding the current interval with 01 being the most recent.

Errored Seconds (ES): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed Second (FS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of severely errored seconds that have occurred.

Severely Errored Second (SES): A one-second period in which 320 or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty Errored Seconds (BES): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Next/previous page: Press <Enter> or <Spacebar> to navigate to the remaining intervals.

Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks and built-in BERT.

The built-in BERT generator and testers can be used along with loopbacks to test and determine the status of the Quad DS-1 module. They may also be used in conjunction with diagnostic facilities on other DACS II AX cards to qualify operation of the backplane connections.

Before proceeding to the diagnostic menus to initiate BERT patterns, you must enter the DSL Port Management Menus and choose the type of Loopback test you want to run.

Procedure

To set up Diagnostic Tests:



NOTE:

Before choosing a BERT pattern you must enter the DSL Management menus and choose the type of Loopback test you want to run.

1. From the *Quad DS-1 Main Menu*, place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies          DACS II AX - Quad T1          Slot:09  Help = [?]

Quad T-1 diagnostics

NI BERT.....: Off          Off          Off          Off
Error seconds.: 0           0           0           0
Seconds in test: 0          0           0           0

                State ErrSec  State ErrSec  State ErrSec  State ErrSec
AIS.....: Yes  10         Yes  10         Yes  10         Yes  10
RED.....: Yes  10         Yes  10         Yes  10         Yes  10
YEL.....: No   0          No   0          No   0          No   0
Ferr.....: Yes  10         Yes  10         Yes  10         Yes  10
CRC6.....: Yes  10         Yes  10         Yes  10         Yes  10
BPV.....: No   0          No   0          No   0          No   0
LOS.....: No   0          No   0          No   0          No   0
Frame Slip.....: Yes  10         Yes  10         Yes  10         Yes  10
***Access the DSL Port Menu for all Loopback Commands!

[R]eset counts      Insert bert [e]rrors

```

Figure 15-14. Quad DS-1 Diagnostics Menu

2. Use the **<Spacebar>** to toggle between ports to select NI BERT patterns. Press **<Enter>** and the following menu appears:

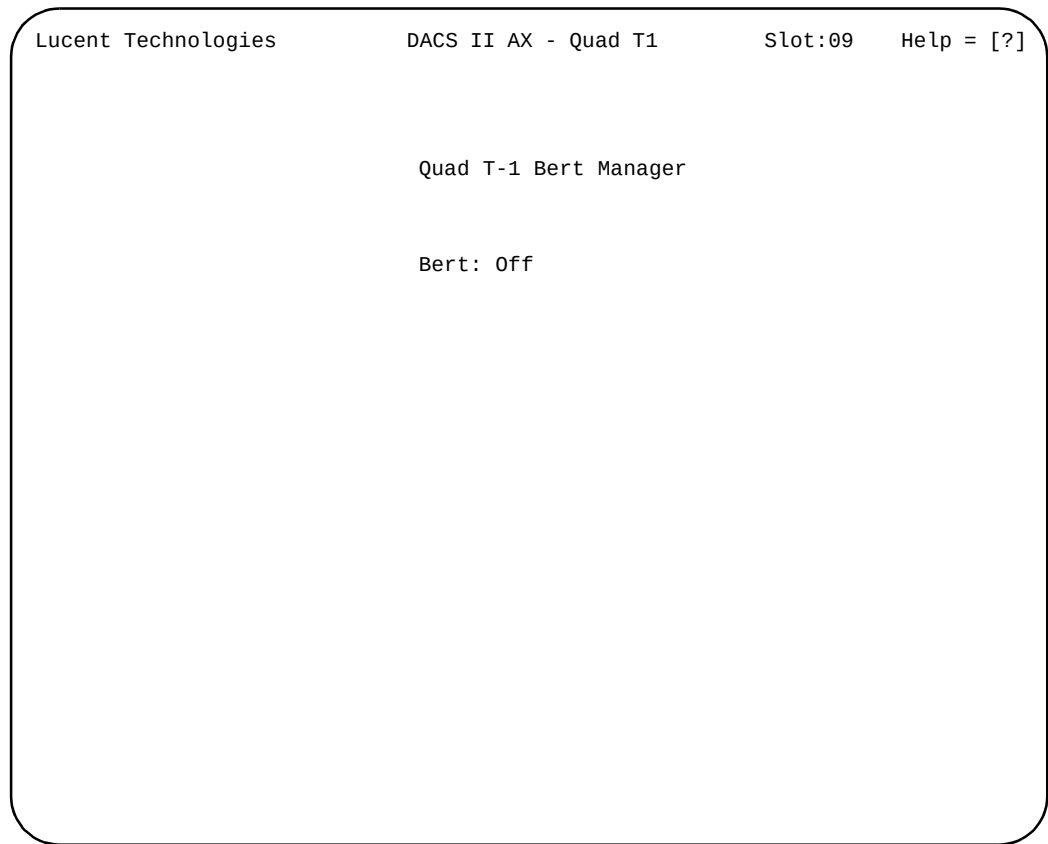


Figure 15-15. Quad DS-1 BERT Manager Menu

3. Press **<Enter>** to select the desired BERT pattern.
 - 2047 - The Test LED will light green with this selected pattern.
 - 3 of 24
 - All Ones
 - All 0's
 - QRSS
4. To save changes, press **X**.
5. When prompted "Send (chosen BERT pattern) Are you sure(Y/N)?" Press **Y**. The *Quad DS-1 Diagnostic Menu* appears.

6. Choose one of the following actions to:
 - Reset counts, press **R**.
 - Insert BERT errors, press **e**.
 - Save changes and exit to the previous menu, press **X**.
 7. When finished, proceed to the *DSL Port Management Menu* to monitor statistics.
-

Diagnostics Menu Field Descriptions

NI BERT: This is useful for testing the bit error rate of the communication circuit via the NI. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality.

Error seconds: This read-only count represents the number of errored seconds that occurred in a one second period while the Quad DS-1 module was in test.

Seconds in test: This read-only count represents the number of seconds the Quad DS-1 module was in test.

AIS: An unframed "all ones" condition has been detected.

Red Alarm (RED): A "loss of frame alignment" has occurred and synchronization has been lost.

Yellow Alarm (YEL): A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not receiving the DACS II AX signaling correctly. (The network is not in sync or a red alarm has occurred.)

Framing Errors (Ferr): One or more frame alignment bit errors have been detected. This does not mean that synchronization has been lost.

CRC6 Alarm: One or more CRC6 block errors have been detected. The D4 framing does not include CRC6; the DACS II AX Quad DS-1 module replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance.

BPV: Bipolar Violations have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.

LOS: This indicates a loss of signal detection. No signal is present on the RX pair to the DACS II AX Quad DS-1 module. (T-1 loop)

Frame Slip: Frame slip is indicated if slip has been detected in the receive path.

DSL Port Management Menu

The DSL Port Management Menu provides the capability to View Span Status, Set Clock, Change System Settings, change Loopbacks, and Name the Circuit ID number for each port. You can also View Performance Data, Performance History and the Alarm History for each port.

Procedure

To configure or view parameters for the xDSL Mini Module:

1. From the *Quad DS-1 Main Menu*, place your cursor on the *DSL Port Management* field and press **<Enter>**. The following menu appears:

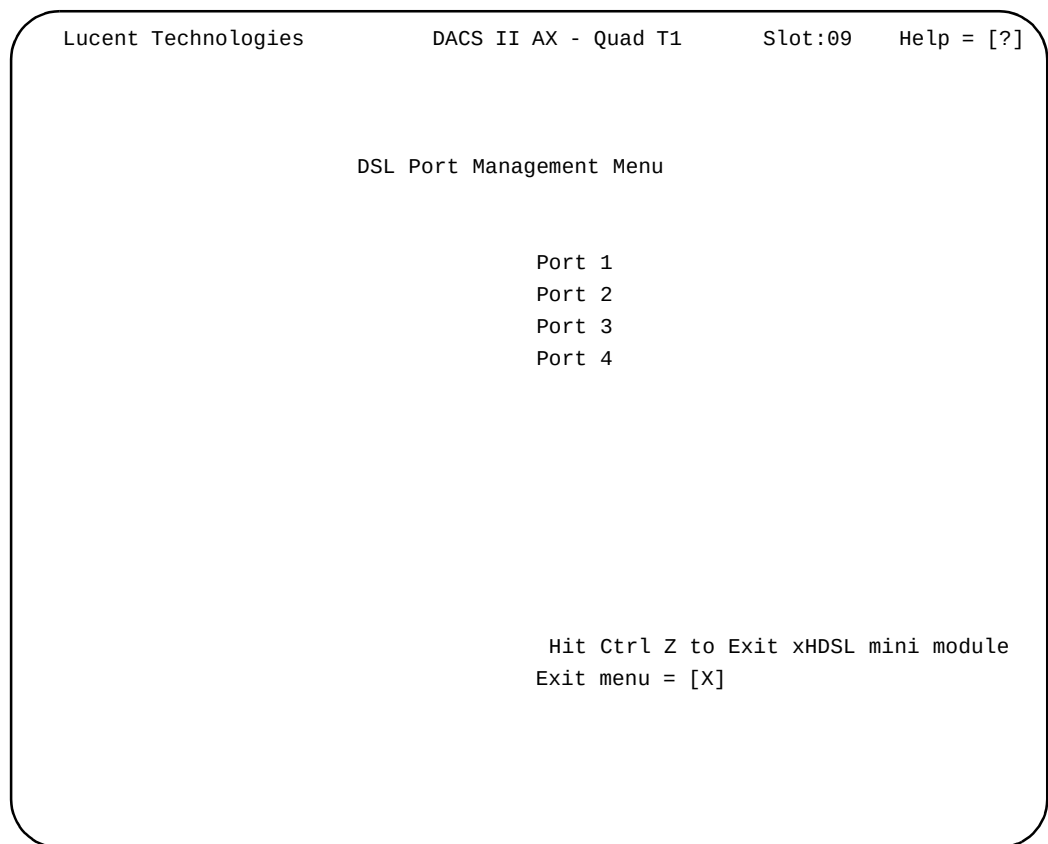


Figure 15-16. DSL Port Management Menu

2. At the *DSL Port Management Menu*, place your cursor on one of the four ports and press **<Enter>**. A message appears prompting you to **"HIT SPACE BARS."**

3. Press the **<Spacebar>** twice to access the next menu, which is the *Maintenance Terminal Main Menu*. There are eight lettered submenus on this menu that allow you to view or configure various parameters for the xDSL mini module.

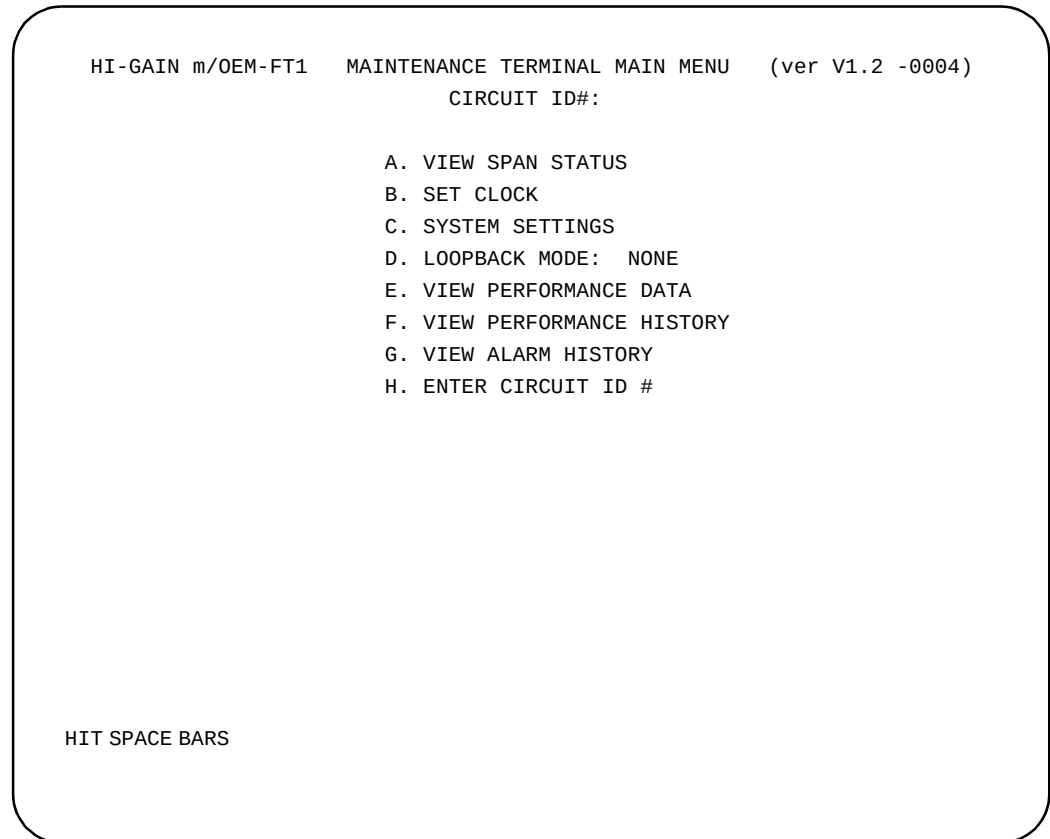


Figure 15-17. Maintenance Terminal Main Menu

Command Keys

When you select one of the submenus (A-H) from the Maintenance Terminal Main Menu, a list of commands appear near the bottom of the screen. The most common are listed below. Additional commands are listed on submenus.

Table 15-1. Maintenance Terminal Main Menu Commands

Action	Command Key
Exit screen	E
Clear the read-only error counters	C
Update the screen	U
Return to the DSL Port Management Menu	Ctrl Z
Return to the Node Summary Menu	Ctrl C

View Span Status Screen

1. Press **A** from the *Maintenance Terminal Main Menu* and the *View Span Status* menu appears. On this menu you can observe the condition or status of the copper pair that goes from the local unit to the remote unit. These conditions may be observed over a 24-hour period.

```

                                SPAN STATUS
                                ( HLU/ver1.2-0004: HRU/ver0.0-0000)

TIME: 00:50:17
DATE: 07/13/97                CIRCUIT ID#:

ALARMS:   LAIS LOSW
LOOPBACK: OFF

                                HLU                HRU
                                HDSL                HDSL
                                cur/min/max          cur/min/max

MARGIN:                N/A                N/A    dB
PULSE ATTN:            N/A                N/A    dB
PPM OFFSET:            N/A                N/A    ppm
24 HOUR ES:            00000              00000  seconds
24 HOUR UAS:            03017              00000  seconds

                                DS1 STATUS

                                HLU                HRU

24 HOUR BPV Seconds:    00001              00000
24 HOUR UAS Count:      00000              00000
Frame type:             ESF                ESF
Code type:              AMI                AMI

                                (E)xit (C)lear (U)pdate

```

Figure 15-18. View Span Status Screen

2. Press **C** to clear or **U** to update.
3. Press **E** to exit. The *Maintenance Terminal Menu* appears.

Span Status Field Descriptions

The following alarms lists the values and describes the conditions that could appear in the Span Status menu fields.

Alarms:

- **LLOS** - Local Loss of Signal. Signal is absent at the local DS1 input port.
- **RLOS** - Remote Loss of Signal. Signal is absent at the remote DS1 input port.
- **LOSW 1** - Loss of Sync Word. HDSL loop 1 has lost synchronization.
- **LOSW 2** - Loss of Sync Word. HDSL loop 2 has lost synchronization.
- **H1ES** - HDSL loop 1 Errored Second. The number of HDSL ES detected HDSL input port of the master or slave on the current span has exceeded the user-defined threshold.
- **H2ES** - HDSL loop 2 Errored Second. The number of HDSL ES detected HDSL input port of the master or slave on the current span has exceeded the user-defined threshold.
- **DS1 (FOR T1/FT1)** - DS1 BPV Error. The number of BVP ES detected on the DS1 input of the HLU or HRU has exceeded the user-defined threshold.
- **G703 (FOR E1)** - G703 BPV Error. The number of BVP ES detected on the G703 input of the HLU or HRU has exceeded the user-defined threshold.
- **LAIS** - Local Alarm Indication Signal. The local unit is transmitting an AIS bit pattern (all 1 bits).
- **RAIS** - Remote Alarm Indication Signal. The remote unit is transmitting an AIS bit pattern (all 1 bits).
- **MAL1** - Margin Alarm. The margin on HDSL loop 1 of the current span has dropped below the user-defined threshold.
- **MAL2** - Margin Alarm. The margin on HDSL loop 2 of the current span has dropped below the user-defined threshold.
- **CHREV** - Channels Reversed. The HDSL loops are reversed at the HDSL input ports.
- **NONE** - No Alarm condition detected.

Loopbacks:

- **NREM** - Network Remote Loopback. Loopback at the slave unit toward the network.
- **NLOC** - Network Local Loopback. Loopback at the master unit toward the network.
- **CLOC** - Customer Local Loopback. Loopback at the slave unit toward the customer.
- **CREM** - Customer Remote Loopback. Loopback at the master unit toward the customer.
- **NONE** - Loopbacks are not enabled.

Margin: The margin appears in the format xx/yy/zz. If the loop is not in sync, N/A appears in the margin field.

xx is the current margin updated in real-time.

yy is the minimum value since last cleared.

zz is the maximum value since last cleared.

Pulse ATTN: Displays the attenuation of the HDSL 2B I Q pulse from the distant end. The normal range is from 1 - 32 dB.

PPM OFFSET: Displays the relative offset of the crystal oscillator in the master unit from the crystal oscillator in the master unit from the crystal oscillator in the slave unit. Any value between -64 and +64 is adequate. Values outside this range indicate out-of tolerance components or excessive temperature drift in critical components.

24-HOUR ES: Displays the number of seconds that contained at least one HDSL CRC error during the current 24-hour period.

24-HOUR BVP Seconds: Displays the number of seconds at least one BVP was detected at the HLU or HRU DS1 input port.

24-HOUR UAS Count: Displays the number of seconds the HLU or HRU DS1 signal was absent (125 or more consecutive zeros).

Frame type: DS1 frame format at (SF, ESF or unframed) the unit is receiving.

Code type: The encoding type (AMI, B8ZS) that the unit is transmitting.

Set Clock Menu

1. Press **B** from the *Maintenance Terminal Menu* and the *Set Clock* menu appears.

```

                                SET CLOCK

TIME: 19:13:13
DATE: 10/07/97
CIRCUIT ID#:

Format: HH:MM
        MM/DD/YY

NEW TIME:
```

Figure 15-19. Set Clock Menu

2. Set the time by typing HH:MM:SS, where HH=hours, MM=minutes, and SS=seconds. Setting the seconds is optional. Press **<Enter>** to confirm the time selection.
3. Set the date by typing MM/DD/YY: where MM=month, DD=day and YY=the last two digits of the year. Press **<Enter>** to confirm the date selection. The *Maintenance Terminal Menu* appears.
4. If the time and date are already set accurately, then press **<Enter>** twice to return to the *Maintenance Terminal Menu*.

System Settings Menu

1. Press **C** from the *Maintenance Terminal Main Menu* and the *System Settings* menu appears. This screen displays system parameters.

```

SYSTEM SETTINGS

TIME: 00:52:12
DATE: 07/13/97          CIRCUIT ID#:

SMART-JACK (L)B:        ENABLE
(S)PECIAL LPBK:         GNLB
(Z)BTISI:               OFF
ES ALARM TH(R)ES:       NONE
LOOPBACK (T)IMEOUT:     60
(A)LARM:                ENABLE
(D)S1 LINE CODE:        AUTO
(F)RAMING:              AUTO
AIS ON (H)DSL ALRM:     ENABLE
AIS ON S(M)JK/NREM:     ENABLE
MAR(G)IN ALM THRES:     4
DSO (B)LOCKING: xx - Blocked Channels
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
                                xx xx xx xx xx xx xx xx xx xx xx xx xx
                                (E)xit
Enter the letter in parenthesis (X) to change any setting

```

Figure 15-20. System Settings Menu

2. To change a setting, type the letter shown in parentheses. This action will cause the screen to refresh and reflects the new information.
3. After all parameters have been set, press **E** to exit, and **C** to confirm your entries. The new parameters are now activated. The *Maintenance Terminal Menu* appears.

NOTE:

The System Settings menu is void of letters in parenthesis and nonconfigured if the port is set for Slave in the Quad DS-1 configuration menu.

System Settings Field Descriptions

The following lists the fields and the corresponding values that can be selected in the System Settings Menu.

SMART-JACK (L)B:

- *ENABLED* - System recognizes all Smart-Jack loopback commands.
- *DISABLED* - System ignores all Smart-Jack loopback commands.

(S)PECIAL LPBK:

- *GNLB* - Generic in band loopback. Enables response to the generic 3/4 in 7 in-band loopback.
- *A1LB* - Enables response to the T1/E1.4/92 addressable repeater in-band loopback codes.

The Addressable Repeater Loopback commands (*A2LB* - *A5LB0*) provide the module with sophisticated maintenance and troubleshooting tools. The following loopbacks have been enhanced to handle the specific requirements of the customers noted in brackets:

- *A2LB* - [Southwestern Bell] Enables response to the Teltrend addressable repeater in-band loopback codes.
- *A3LB* - [NYNEX] Enables response to the Wescom addressable repeater in-band loopback codes.
- *A4LB* - [NYNEX] Enables response to the Wescom Mod 1 addressable repeater in-band loopback codes.
- *A5LB* - [Southern New England Tel (SNET)] Enables response to the Teltrend Mod 1 addressable repeater in-band loopback codes.

(Z)BTSl:

- *On* - ESF frame operates in the ZBTSl mode.
- *Off* - ESF frame operates in the normal (non-ZBTSl) mode.

ES ALARM TH(R)ES:

- *17* - Sets an errored second threshold value of 17 seconds for generating HDsl alarms (H1ES or H2ES) or BiPolar Violation Alarms (DS1) over a 24-hour period.
- *170* - Sets an errored second threshold value of 170 seconds for generating HDsl alarms (H1ES or H2ES) or BiPolar Violation Alarms (DS1) over a 24-hour period.
- *NONE* - Disable generation of errored second alarms.

LOOPBACK (T)IMEOUT:

- *NONE* - Disables automatic time-out cancellation of all loopbacks.
- *20* - Selects a 20 minute automatic time-out cancellation of all loopbacks.
- *60* - Selects a 60 minute automatic time-out cancellation of all loopbacks.
- *120* - Selects a 120 minute automatic time-out cancellation of all loopbacks.

(A)LARM:

- *DISABLE* - Disables external notification of alarm on alarm interface signal.
- *ENABLE* - Enables external indication of alarm condition.

(D)S1 LINE CODE:

- *AUTO* (T1 and FT1) - The master and slave units independently monitor their incoming DS1 bit streams for the B8ZS pattern. If either unit detects this pattern, it enters its B8ZS mode. It reverts back to the AMI mode if no B8ZS patterns are received for five seconds. This parameter is only valid when an HLU or an HRU is in the circuit or when a T1 or FT1 Mini OEM Module is in extended mode.
- *B8ZS* - Binary Eight Zero Substitution. Both the master and slave units enter the B8ZS mode.
- *AMI* - Alternative Mark Inversion. Both the master and slave units enter the AMI mode.

(F)RAMING:

- *AUTO* (T1 and FT1) - The system operates in an auto-framing mode, continuously searching the input T1 bit stream for a valid SF or ESF frame pattern. Using the auto mode for unframed application may cause the detection of pseudo-valid frame sequences, affecting data integrity.
- *UNFR* - Unframed. This mode disables the auto framing process and forces the system to function in Transparent mode.

AIS ON (H)DSL ALRM:

- *ENABLED*
- *DISABLED*

AIS ON S(M)JK/NREM:

- *ENABLED*
- *DISABLED*

MAR(G)IN ALM THRES: (text field) Specifies the HDSL margin alarm threshold value. The threshold must be in the range of 0 - 15 dB. Below this value an alarm occurs. The default value is 4 dB. Setting the threshold value to 0 turns the margin alarm off.

DS0 (B)LOCKING: (text field) Specifies the DS0 channels to be blocked. Separate each channel with a space when entering more than one. You can block DS0 channels 01-24.

Loopback Menu

1. Press **D** from the *Maintenance Terminal Main Menu* and the *Loopback Mode* menu appears. From this menu you can enable/disable loopbacks; set the network loop for the local or remote site; or set the customer loop for the local or remote locations.

```

                                LOOPBACK MENU

TIME: 04:47:22
DATE: 09/28/98
CIRCUIT ID#:

A. DISABLE LOOPBACKS
B. NETWORK LOOP HLU      (NLOC)
C. NETWORK LOOP HRU      (NREM)
G. CUSTOMER LOOP HLU      (CREM)
H. CUSTOMER LOOP HRU      (CLOC)

(E)xit

```

Figure 15-21. Loopback Menu

2. Select a loopback mode by entering the corresponding letter. Please Wait..... appears on the screen. The *Maintenance Terminal Main Menu* appears. Table 15-2 describes the loop selections.



NOTE:

The Loop Mode on the Maintenance Terminal Main Menu displays the loopback the user has chosen.

Table 15-2. Quad DS-1 with xDSL Loops

Loop selections	Description
NLOC - Network Loop HLU	Enables a loopback at the master unit toward the network.
NREM - Network Loop HRU	Enables a loopback at the slave unit toward the network.
CREM - Customer Loop HLU	Enables a loopback at the master unit toward the customer.
CLOC Customer Loop HRU	Enables a loopback at the slave unit toward the customer.
Disable Loopbacks	Disables all loopbacks.

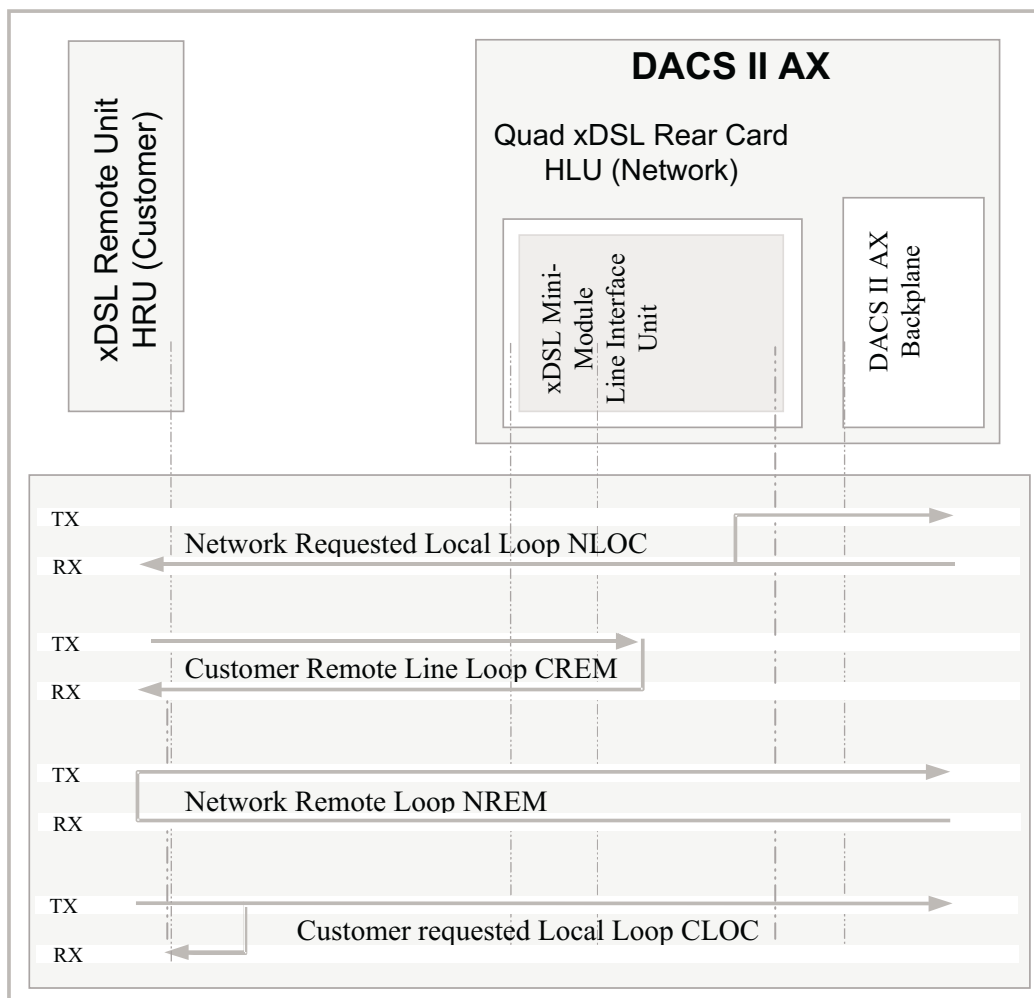


Figure 15-22. Quad DS-1 with xDSL Loops

View Performance Data Menu

1. Press **E** from the *Maintenance Terminal Main Menu* and the *View Performance Data* menu appears. This menu shows the errored and unavailable seconds for both HDSL loops and each DS-1 input for 15-minute intervals.

Date: 09/28/98	PERFORMANCE DATA			
CIRCUIT ID#:				
	ERRORED SECONDS/UNAVAILABLE SECONDS			
	DS1		HDSL	
	HLU	HRU	HLU	HRU
19:30	000/000	000/000	000/900	000/000
19:45	000/000	000/000	000/900	000/000
20:00	000/000	000/000	000/900	000/000
20:15	000/000	000/000	000/900	000/000
20:30	000/000	000/000	000/900	000/000
20:45	000/000	000/000	000/900	000/000
21:00	000/000	000/000	000/900	000/000
21:15	000/000	000/000	000/900	000/000
21:30	000/000	000/000	000/900	000/000
21:45	000/000	000/000	000/900	000/000
22:00	000/000	000/000	000/900	000/000
22:15	000/000	000/000	000/900	000/000
22:30	000/000	000/000	000/900	000/000
22:45	000/000	000/000	000/900	000/000
23:00	000/000	000/000	000/900	000/000
23:15	000/000	000/000	000/900	000/000
(E)xit (P)revious (N)ext				

Figure 15-23. View Performance Data Menu

The format for the data is xxx/yyy where:

xxx is the number of errored seconds that occurred during a fifteen minute period.

yyy is the number of seconds during a fifteen minute period when the link or signal was deemed unavailable.

2. The previous option **P** shows the performance data for the previous four hours. The next option **N** shows the performance data for the next four hours.
3. Press **E** to exit. The *Maintenance Terminal Main Menu* appears.

**NOTE:**

To clear or update the performance data go to the View Span Status screen (A on the Maintenance Terminal Main Menu).

Performance History Menu

1. Press **F** from the *Maintenance Terminal Main Menu* and the *View Performance History* menu appears. This menu shows the errored and unavailable seconds for a 24-hour period. HDSL loops and DS-1 input are listed for the current and previous seven days.

Time: 19:23:49
7 DAY HISTORY

CIRCUIT ID#:

ERRORED SECONDS/UNAVAILABLE SECONDS

	DS1		HDSL	
	HLU	HRU	HLU	HRU
09/30	00000/00000	00000/00000	00000/00000	00000/00000
10/01	00000/00000	00000/00000	00000/00000	00000/00000
10/02	00000/00000	00000/00000	00000/00000	00000/00000
10/03	00000/00000	00000/00000	00000/00000	00000/00000
10/04	00000/00000	00000/00000	00000/00000	00000/00000
10/05	00000/00000	00000/00000	00000/00000	00000/00000
10/06	00000/00000	00000/00000	00000/86398	00000/00000
current	00000/00000	00000/00000	00000/70200	00000/00000

(E)xit

Figure 15-24. View Performance History Menu

2. Press **E** to exit. The *Maintenance Terminal Main Menu* appears.



NOTE:

To clear or update the performance data go to the View Span Status screen (A on the Maintenance Terminal Main Menu).

Alarm History Menu

1. Press **G** from the *Maintenance Terminal Main Menu* and the *Alarm History* menu appears. This screen contains the time and date stamp of the first and last occurrence of each alarm. The maximum nonoverflowing count on this screen is 999.

ALARM HISTORY

TIME: 01:09:31
DATE: 07/13/97
CIRCUIT ID#:

Type	First	Last	Current	Count
LOS, DS1-HLU			OK	000
LOS, DS1-HRU			OK	000
LOSW, HDSL	07/13/97-01:11	07/13/97-01:11	ALARM	001
ES, HDSL			OK	000
MARGIN LP			OK	000

LAST CLEARED: 07/13/97-01:11

(E)xit (C)lear (U)pdate

Figure 15-25. View Alarm History Menu

2. Press **C** to clear the counts. Press **U** to update.
3. Press **E** to exit. The *Maintenance Terminal Main Menu* appears.

Alarm History Field Descriptions

The following text lists the values and describes the conditions that could appear in the Alarm History menu fields.

Type:

- **LOS** - Loss of DS1 or G703 input signal
- **LOSW** - Loss of sync word for each HDSL link.
- **ES** - Errored seconds exceeded threshold.
- **Margin** - HDSL margin threshold exceeded.

First: Displays the first occurrence of each alarm.

Last: Displays the Last occurrence of each alarm.

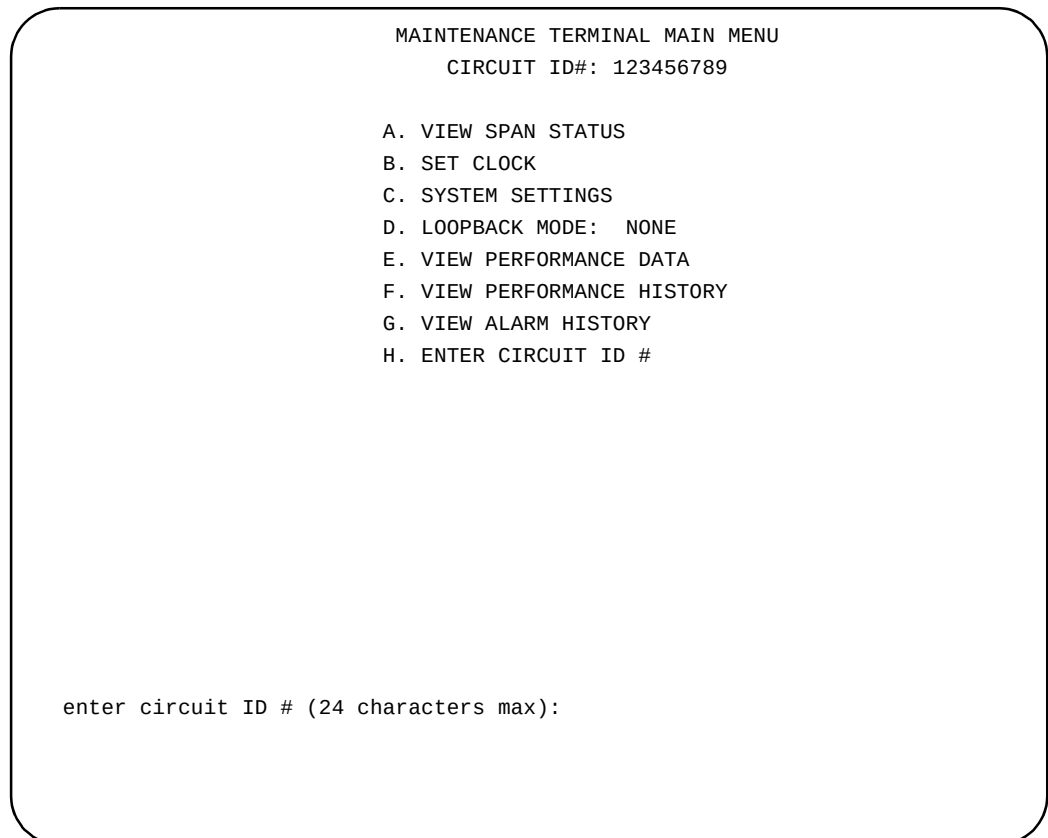
Current: Displays the current alarm status.

Count: Displays the number of times each alarm has occurred.

Last Cleared: Displays the last time and date that the alarm history was cleared.

Circuit ID# Menu

1. Press **H** from the *Maintenance Terminal Main Menu* to assign a Circuit ID#. A Circuit ID# is an identifier of up to 24 alphanumeric characters. The Circuit ID# is displayed at the top of each menu to identify each unit.



MAINTENANCE TERMINAL MAIN MENU
CIRCUIT ID#: 123456789

A. VIEW SPAN STATUS
B. SET CLOCK
C. SYSTEM SETTINGS
D. LOOPBACK MODE: NONE
E. VIEW PERFORMANCE DATA
F. VIEW PERFORMANCE HISTORY
G. VIEW ALARM HISTORY
H. ENTER CIRCUIT ID #

enter circuit ID # (24 characters max):

Figure 15-26. Enter Circuit ID #

2. Enter a Circuit ID# and press **<Enter>**.
3. Press **C** to Confirm. The *Maintenance Terminal Main Menu* appears.
This entry is stored in NVRAM and remains even after a loss of power. The Circuit ID # is not available at the remote location of the maintenance port.

Utilities Menu

**WARNING:**

The fields shown in this menu should not be accessed or configured unless you are established as a high level user; they are only for debugging purposes. It is strongly suggested that you do not use Utilities unless prompted to do so by a Lucent Technologies technical support representative.

Procedure

To access the Utilities:

1. From the *Quad DS-1 Main Menu*, place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

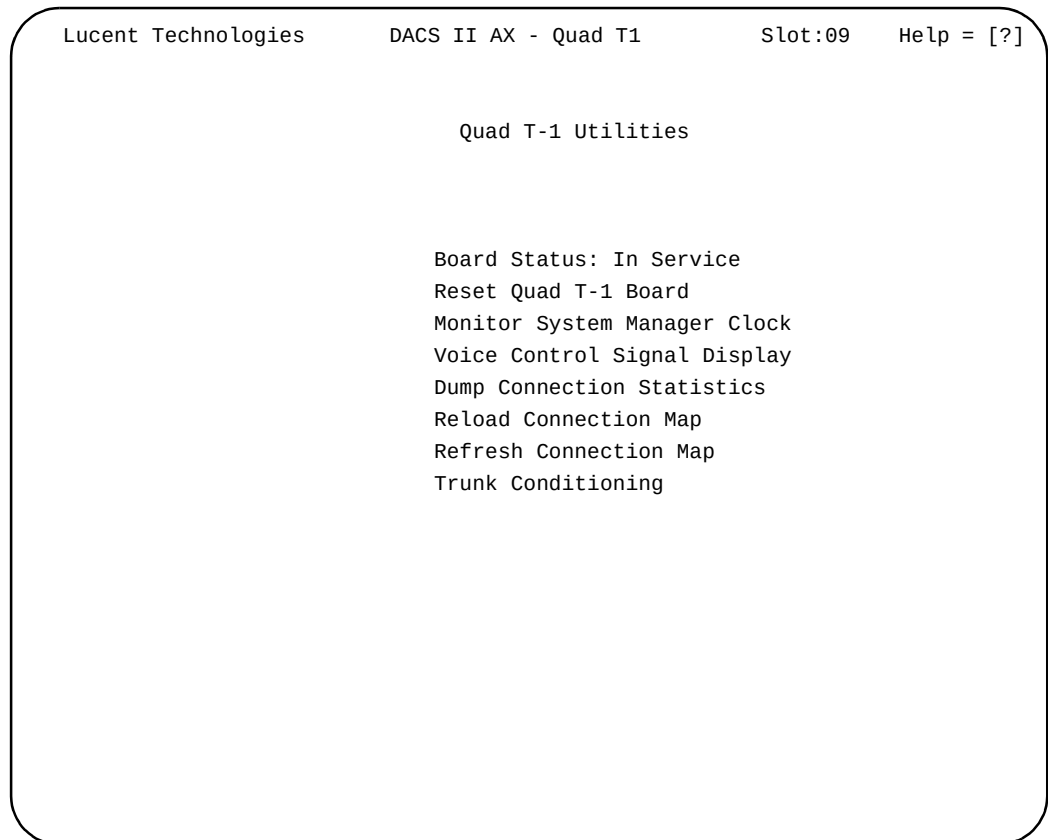


Figure 15-27. Quad DS-1 Utilities Menu

Procedure

To set the Board Status:

The Board Status screen allows the Administrator to put a device in service or out of service.

1. Place your cursor on the *Board Status: In Service* field and press **<Enter>**.
The following screen appears:

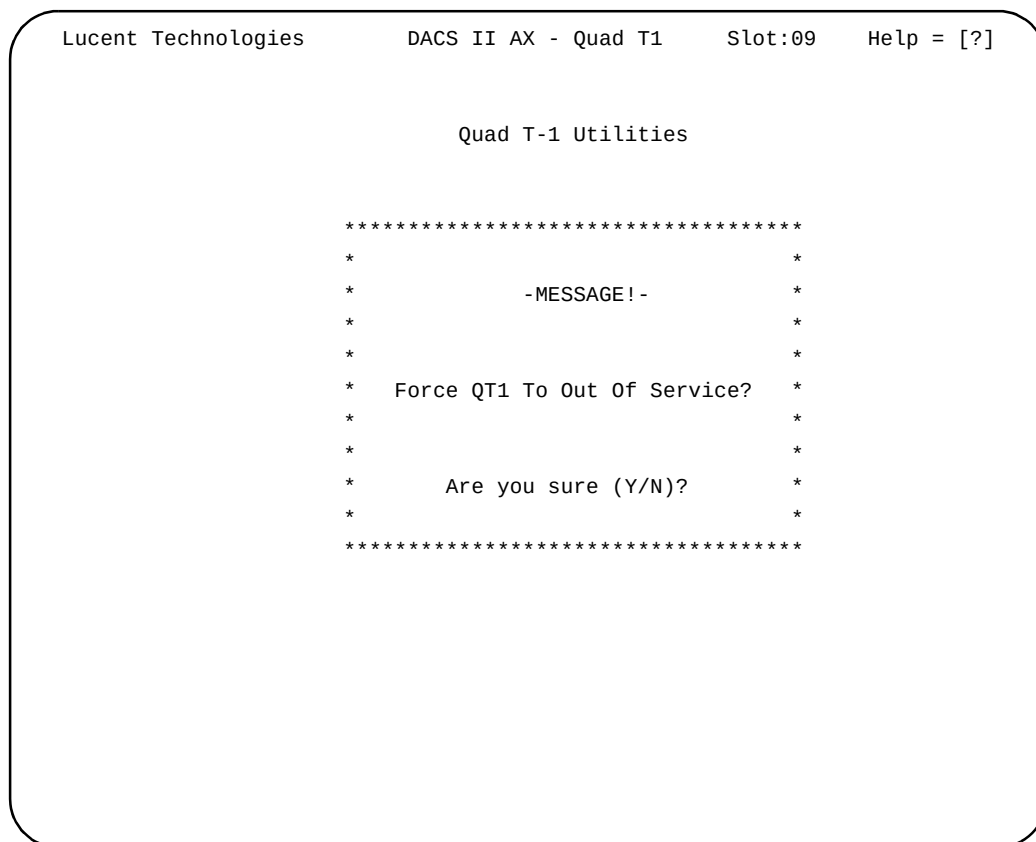


Figure 15-28. Board Status Screen

2. Press **Y** to force Quad DS-1 *Out of Service* or press **N** to return to the *Utilities Menu*.

**NOTE:**

The ERROR LED turns red when the Quad DS-1 module is set to Out of Service.

Procedure

To change the Board Status to In Service:

1. From the *Quad DS-1 Utilities Menu*, select the *Board Status - Out of Service* field and press **<Enter>**. The following screen appears:

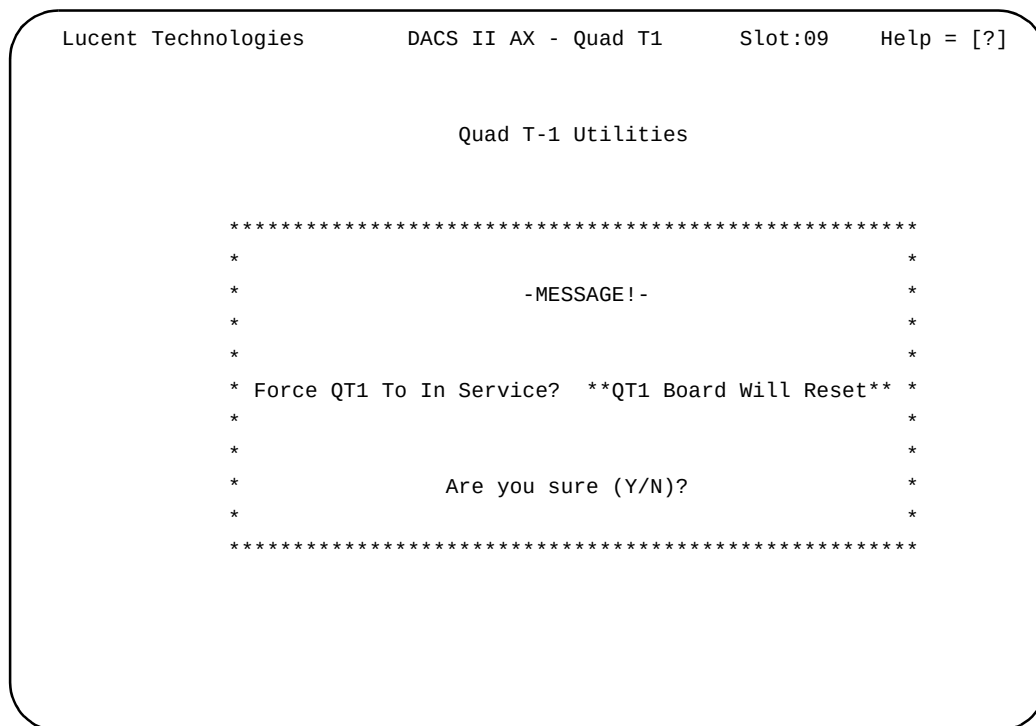


Figure 15-29. Change Board Status Screen

2. Press **Y** to reset Board Status to *In Service*. The following message appears: "Reset this Quad DS-1 Board? Are you sure (Y/N)?" Press **Y** and the next message appears: "Alert! Please wait while we establish communications with the system manager! Press any key to continue."
3. Press **N** to leave the Board Status as *Out of Service*.

**NOTE:**

It can take up to 20 seconds for the Board Status to change to In Service. When the status changes to In Service, the red ERROR LED goes out and you are returned to the Node Summary Menu. The Quad DS-1 module's state may cycle through a combination of "On-line", "Standby", and "Out of Service", and finally "On-line". This is a normal occurrence when the device resets.

Procedure

To reset the Board:

The Reset utility causes the Quad DS-1 module to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

1. From the *Quad DS-1 Utilities Menu*, place your cursor on the *Reset Quad DS-1 Board* field and press **<Enter>**. The following screen appears:

```
Lucent Technologies  DACS II AX Quad T-1 Module  Slot: 09  Help = [?]  
  
                          Quad T-1 Utilities  
  
*****  
*                                                                    *  
*                      -MESSAGE! -                                *  
*                                                                    *  
*                                                                    *  
*      Reset This Quad T-1 Board?                                *  
*                                                                    *  
*                                                                    *  
*      Are you sure (Y/N)?                                        *  
*                                                                    *  
*****
```

Figure 15-30. Reset Quad DS-1 Board Screen

2. Press **N** to cancel reset.
3. Press **Y** to reset device and the next screen appears with the following message: "Alert! Please wait while we establish communications with the system manager! Press any key to continue." After a few seconds you are returned to the *Node Summary Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, the Quad DS-1 module's state may cycle through a combination of "On-line", "Standby", and "Out of Service", and finally "On-line". This is a normal occurrence when the device resets.

Procedure

To access the Monitor System Manager Clock:

The Monitor System Manager Clock is a view-only screen that displays the status of vital system timing and the backplane integrity of all slots to indicate if the device is on the bus.

1. From the *Quad DS-1 Utilities Menu*, place your cursor on the *Monitor System Manager Clock* field and press **<Enter>**. The following screen appears:

```

Lucent Technologies          DACS II AX - Quad T1          Slot:09    Help = [?]

                                Monitor Backplane Integrity

Slot #      Slot #      Slot #      Pattern      Patt.      Status
-----      Address      Received      Address      Rcv      (Ignore for QHS)
Slot #1      0x00205007      01      0x00205008      00      ... OK ...
Slot #2      0x00205009      02      0x0020500a      00      ... OK ...
Slot #3      0x0020500b      03      0x0020500c      03
Slot #4      0x0020500d      03      0x0020500e      03
Slot #5      0x0020500f      03      0x00205010      03
Slot #6      0x00205011      03      0x00205012      03
Slot #7      0x00205013      07      0x00205014      00      ... OK ...
Slot #8      0x00205015      03      0x00205016      03
Slot #9      0x00205017      09      0x00205018      00      ... OK ...
Slot #10     0x00205019      03      0x0020501a      03
Slot #11     0x0020501b      0b      0x0020501c      00      ... OK ...

Lost System Clock Count.: 1
Lost Frame Sync Count...: 1      Invalid Signal Ram Locations:0
OnBusBadClock Count: 0      Total Scanner Sweeps:410
OffBusGoodClock Ctr: 0      Total Signal Dirty Sweeps:0

[R]eset clock counter      [C]lear ram counters
  
```

Figure 15-31. Monitor Backplane Integrity Screen

2. To reset the clock counts press **R**.
 3. To clear the RAM counts press **C**.
 4. To return to the *Utilities Menu* press **X**.
-

Monitor Backplane Integrity Field Descriptions

Slot #: Displays the slot number in the backplane. The DACS II AX-4 will have 4 slots displayed, while the DACS II AX-11 will have 11 slots displayed.

Slot # Address: Displays the hexadecimal address of the slot in the backplane.

Slot # Received: Displays the received slot number (hexadecimal).

Pattern Address: Displays the hexadecimal address of the pattern.

Pattern Received: A pattern is being received that indicates the status of the backplane connection. A received pattern of 00 causes "OK" status to be indicated in the *Status* field.

Status (ignore for QHS): Shows the status of the slot's connection to the backplane.

Access Voice Control Signal Display

To access the Voice Control Signal Display:

The Voice Control Signal Display is a view-only screen that displays the control signals from the network (i.e., From Framer) and from the bus (i.e., To Framer).

1. From the *Quad DS-1 Utilities Menu*, place your cursor on the *Voice Control Signal Display* field and press **<Enter>**. The following screen appears:

Lucent Technologies

DACS II AX - Quad T1

Slot:09

Help = [?]

PCM Signalling Display Menu

Port #1		From	To			From	To			
		Framer	Framer			Framer	Framer			
	Write	-----		Read		Write	-----		Read	
DS0	BTS	ABCD	ABCD	BTS		DS0	BTS	ABCD	ABCD	BTS
=====										
1	42	ABCD	ABCD	43		13	**	No Connection		**
2	43	ABCD	ABCD	42<-		14	**	No Connection		**
3	**	No Connection		**		15	**	No Connection		**
4	**	No Connection		**		16	**	No Connection		**
5	**	No Connection		**		17	**	No Connection		**
6	**	No Connection		**		18	**	No Connection		**
7	**	No Connection		**		19	**	No Connection		**
8	**	No Connection		**		20	**	No Connection		**
9	**	No Connection		**		21	**	No Connection		**
10	**	No Connection		**		22	**	No Connection		**
11	**	No Connection		**		23	**	No Connection		**
12	**	No Connection		**		24	**	No Connection		**

I/O Address Data Trans. I/O Address Data Monitor DS0: 02

F-Framer: 00207141 6f 1 T-Bus: 00204029 1f

T-Framer: 00207121 0f 1 F-Bus: 0020502b 0f

[N]ext port [C]lear transitions

Figure 15-32. Voice Control Signal Display

2. To monitor a DS0, press **<Enter>** until the DS0 you want appears. An arrow will appear next to your selection.
3. To move from Port 1 to Port 2, 3 or 4 press **N**. To clear transitions press **C**.
4. To return to the *Utilities Menu* press **X**.

Voice Control Signal Field Descriptions

Port #: Displays the port number on the device.

From Framer: Control signals coming from the NI (network).

To Framer: Control signals going towards the NI (network).

Write BTS: Write Backplane Timeslot.

Read BTS: Read Backplane Timeslot.

DS0: A timeslot.

ABCD: Control signals.

I/O Address: The NI Framer address.

Data: The data received from the NI.

Trans: The control signal transitions (changes) from the NI.

Monitor DS0: Select the DS0 you want to display and monitor.

Commands

[N]ext port: Displays information on the next port.

[C]lear Transitions: Clears the control signal changes counter.

Dump Connection Statistics

To access the Dump Connection Statistics:

The Dump Connection Statistics is a view-only screen that displays the number of connections being used by the Quad DS-1 module.

1. From the *Quad DS-1 Utilities Menu*, place your cursor on the *Dump Connection Statistics* field and press **<Enter>**. The following screen appears:

Lucent Technologies					
DACS II AX - Quad T1					
Slot:09					
Help = [?]					
Display All Connection Statistics...					
	Port 1	Port 2	Port 3	Port 4	Total
Total Signalling TS:	0	0	24	24	48
Total Src Voice TS..	0	0	24	24	48
Total Dest Voice TS:	0	0	24	24	48
Total Src Data TS..	24	24	0	0	48
Total Dest Data TS..	24	24	0	0	48
Total Data TS.....:	48				
Total Voice TS.....:	48				

Total TS Used.....:	96				
E[x]it					

Figure 15-33. Dump Connection Statistics Screen

2. To return to the *Utilities Menu* press **X**.

Dump Connection Statistics Field Descriptions

Port #: Displays the port number on the device.

Total Signalling TS: The total number of voice connections on the port.

Total Src Voice TS: The total number of source voice connections on the port.

Total Dest Voice TS: The total number of destination voice connections on the port.

Total Data TS: The total number of data connections used on the port.

Total Voice TS: The total number of voice connections used on the port.

Total TS Used: The total number of connections used on all ports.

Access Trunk Conditioning

The Trunk Conditioning is a view-only screen that displays the alarm status of the trunk. If the trunk condition status is ON, then it is in an alarm condition. If the trunk is in an alarm condition, and the Quad DS-1 is running data, a Hex 1A code will be sent to the bus (i.e., the other side of the connection). If the trunk is in an alarm condition, and the Quad DS-1 is running voice, an All Ones code will be sent to the bus.

To access the Trunk Conditioning:

1. From the *Quad DS-1 Utilities Menu*, place your cursor on the *Trunk Conditioning* field and press **<Enter>**.

The following screen appears:

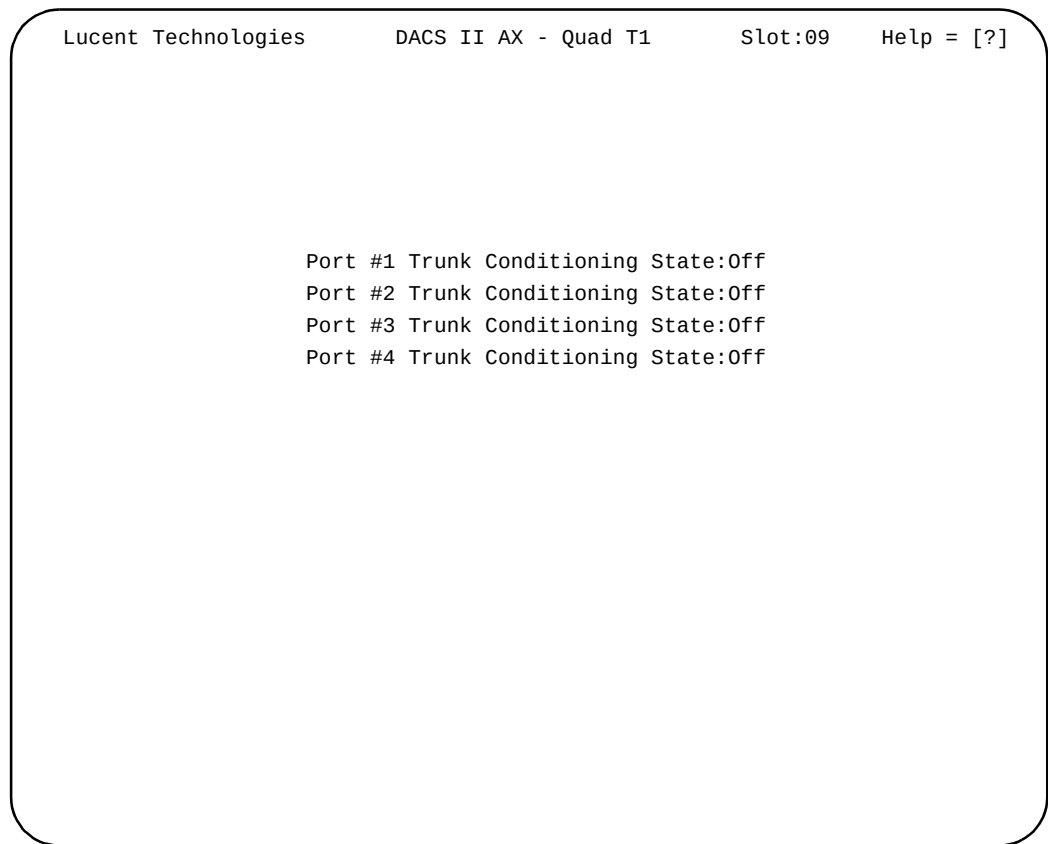


Figure 15-34. Trunk Conditioning

2. To return to the *Utilities Menu* press **X**.

Reload and Refresh the Connection Map Menu

The Reload Connection Map Menu and the Refresh Connection Map Menu options do not invoke submenus. To re-establish an existing connection, position your cursor on either of the fields, and press <Enter>. The action is transparent to the user.

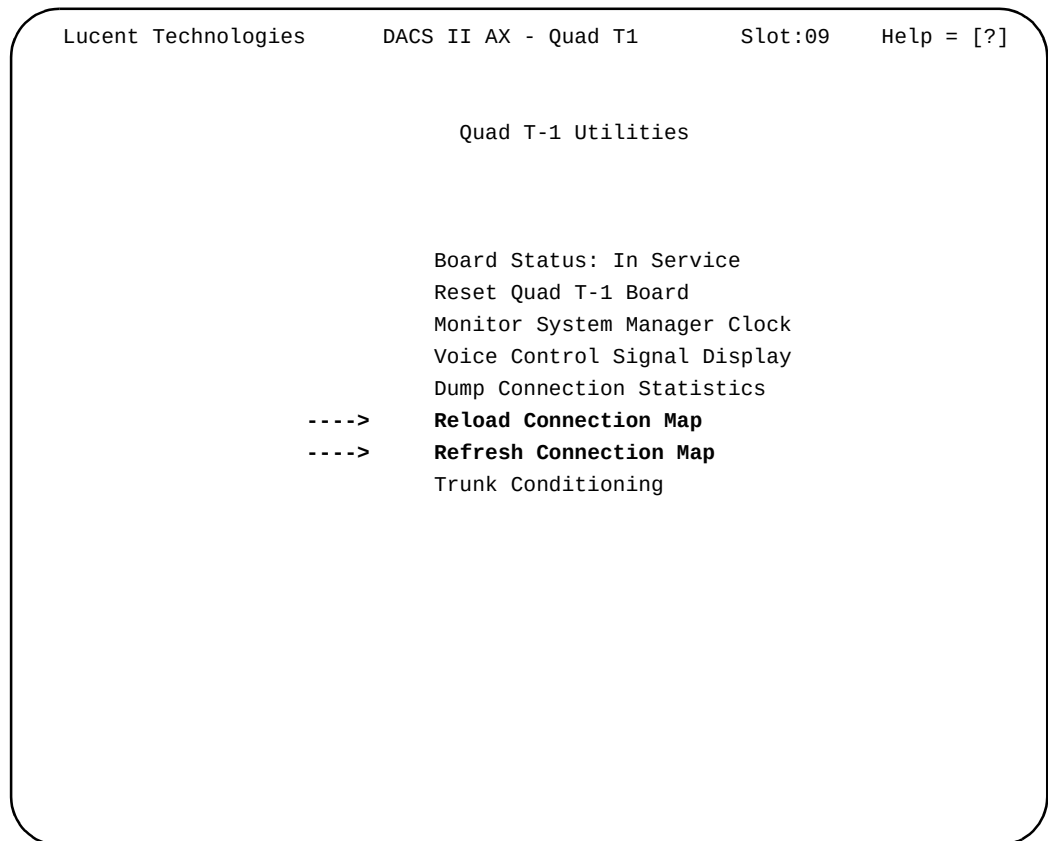


Figure 15-35. Reload and Refresh Connection Map Fields

A Reload Connection Map action happens when an application module requests the SMC II to resend a connection map.

A Refresh Connection Map action happens when an application module refreshes its existing connection map.

About Menu

The Quad DS-1 About Menu is a view only screen that displays the Version, Release Date, Checksum, Voice Signalling Version and RAM Access.

Procedure

To display Identification Information:

1. From the *Quad DS-1 Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following screen appears:

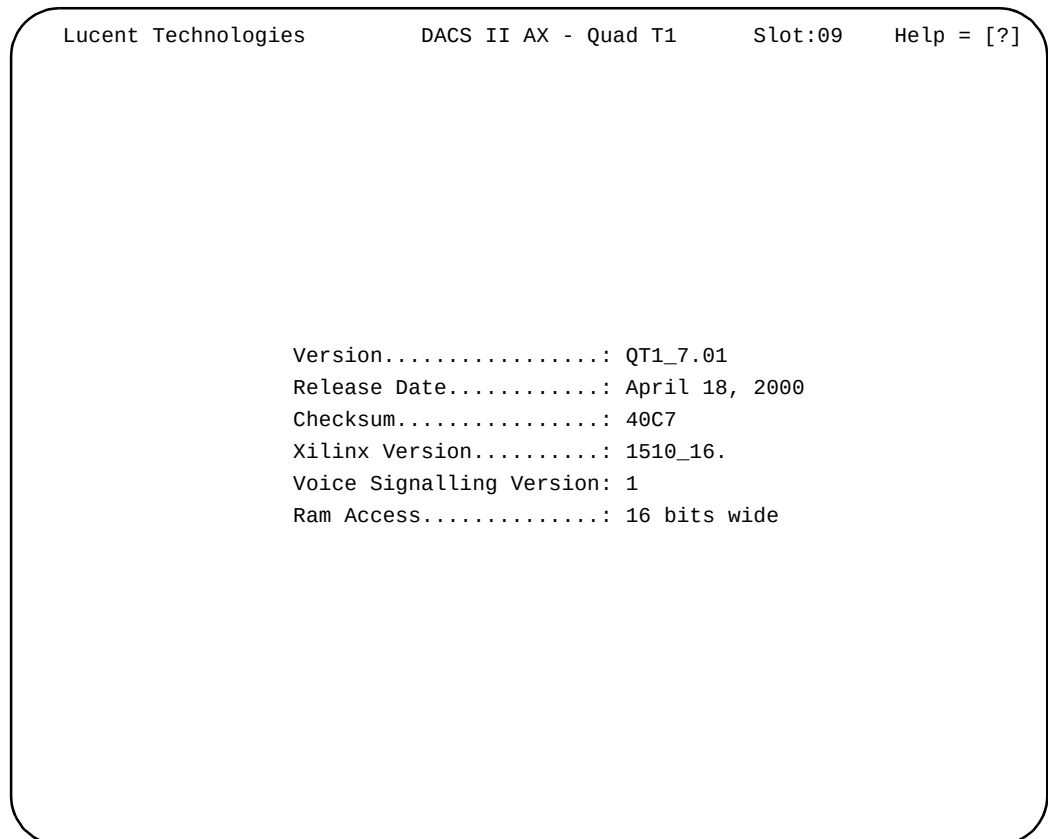


Figure 15-36. Quad DS-1 with xDSL About Screen

About Menu Field Descriptions

Version: Displays the software version currently residing in the Quad DS-1's flash memory.

Release Date: Displays the date of module software release.

Checksum: Displays the sum of all bytes in the Quad DS-1's flash memory at power up. Also used to identify software version.

XILINX Version: Displays the hardware version of downloadable, programmable devices.

Voice Signaling Version: Displays the revision level of software used in the commands bits for voice signaling.

RAM Access: The size of the memory bytes.

Specifications

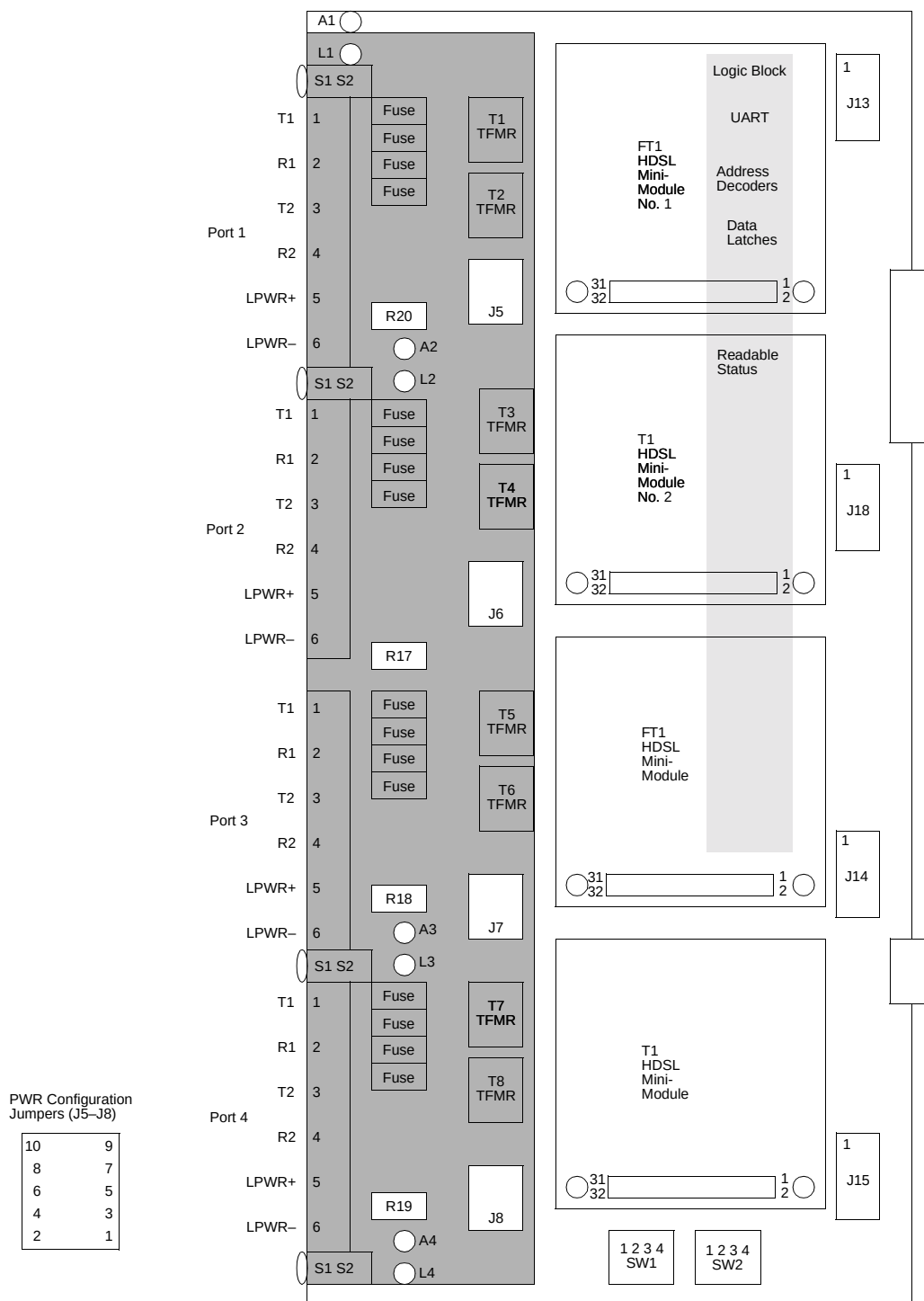
The following section contains Specification tables, a diagram of the HDSL module, HDSL interface and Configuration tables, Line Grounding and PCB Rev 0 Resistor Jumper tables, Indicator and DIP Switch tables for the Quad DS-1 with xDSL.

Table 15-3. Quad DS-1 with xDSL Module Specifications

Loop Technology	Modulation type: 2B1Q Mode: Full duplex, echo cancellation Number of Pairs: 2 for T-1/E-1; 1 for FT-1
HDSL Bit Rate	T-1: 784 kbps/pair E-1: 1040 kbps/pair FT-1: 784 kbps (1 pair)
Status Indicators	Loop 1 & 2 synchronization HDSL alarm Loopback Data Interface: T-1/FT-1 (1.544 Mbps); E-1 (2.048 Mbps) Host Processor Communications Interface: Asynchronous 2-wire serial Input/Output Levels: CMOS levels
Environment	Operating temp: -40 ⁰ C to +85 ⁰ C (-140 ⁰ F to +185 ⁰ F)
Physical Dimensions	2.5" W x 2.0" L x 0.38" H 6.35 cm W x 5.08 cm L x 0.95 cm H 32-pin connector to host board

HDSL Module

The following figure is the HDSL module.



HDSL Interface

Table 15-4. Pin Assignments

Pin 1	Data path to the HDSL Mini-Module
Pin 2	CPU Data from On-Board UART that is going to HDSL
Pin 3	+5V
Pin 4	Data from HDSL Mini Module to UART
Pin 5	Ground
Pin 6	Not Used
Pin 7	Not Used

Locally-Powered HDSL Configuration

If the remote is locally-powered, configure the port as shown below:

- Port 1 = J5
- Port 2 = J6
- Port 3 = J7
- Port 4 = J8

Table 15-5. Locally-Powered HDSL Configuration

Mini Module	1 & 2 (bottom position)	3 & 4	5 & 6	7 & 8	Not Used (top position)
T1				X	
FT1				X	

Since the local end is powered by the network's HDSL base card, make sure you remove all jumpers if the remote master is powering the line. Otherwise, install jumper 7 & 8.

Line Grounding

For on board lightning protection using the on-board solid state surge suppressors, be sure to attach bezel screws and insure the Zero Ohm resistors are intact on the main printed circuit board, at the following indicated locations:

Table 15-6. Line Grounding

Port #	Short 1 & 2
1	R20
2	R17
3	R18
4	R19

**PCB Rev. 0
Resistor Jumper**

The following table should be used if the hardware undergoes a major change.

Table 15-7. PCB Rev. 0 Ohm Resistor Jumper

PCB Rev	R33	R32	R31
0 (released rev)			
1			X
2		X	

Indicators**Table 15-8. Indicators**

DS1	Module 1 Alarm
DS2	Module 1 Loop
DS3 (rear bezel left side)	Module 1 Sync 1
DS3 (rear bezel right side)	Module 1 Sync 2
DS8	Module 2 Alarm
DS7	Module 2 Loop
DS4 (rear bezel left side)	Module 2 Sync 1
DS4 (rear bezel right side)	Module 2 Sync 2

Table 15-8. Indicators

DS10	Module 3 Alarm
DS9	Module 3 Loop
DS5 (rear bezel left side)	Module 3 Sync 1
DS5 (rear bezel right side)	Module 3 Sync 2
DS12	Module 4 Alarm
DS11	Module 4 Loop
DS6 (rear bezel left side)	Module 4 Sync 1
DS6 (rear bezel right side)	Module 4 Sync 2

DIP Switch Settings

Table 15-9. DIP Switch Settings

SW1-1	SW1-2	Module 1 type at J9 for Port 1
ON	ON	Module not installed
ON	OFF	FT1
OFF	ON	T1
OFF	OFF	Undefined
SW1-3	SW1-4	Module 2 type at J10 for Port 2
ON	ON	Module not installed
ON	OFF	FT1
OFF	ON	T1
OFF	OFF	Undefined
SW2-1	SW2-2	Module 3 type at J11 for Port 3
ON	ON	Module not installed
ON	OFF	FT1

Table 15-9. DIP Switch Settings

OFF	ON	T1
OFF	OFF	Undefined
SW2-3	SW2-4	Module 4 type at J12 for Port 4
ON	ON	Module not installed
ON	OFF	FT1
OFF	ON	T1
OFF	OFF	Undefined

Contents

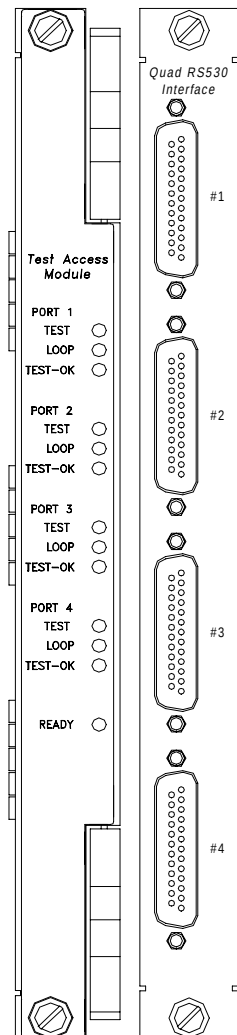
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■ Regulatory Information	<u>16-4</u>
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Physical Description



The Test Access Module (TAM) is an intrusive test device when you are testing split source or split destination. The TAM is a non-intrusive test device when you are monitoring the source or destination. It provides four independent test ports to send DDS Latching Loopback codes at 56 and 64 Kbps. It can also execute and/or monitor test patterns at 48 Kbps to 2.048 Mbps. Each of the four ports have network bus connections that function simultaneously and independently of each other. The TAM application module requires the Quad High Speed Interface Module to which test equipment can be attached.

There are four sets of LEDs, one set for each port, and a READY LED located on the TAM application module.

- **TEST** - green indicates a test is being performed on the port.
- **LOOP** - yellow indicates a loopback condition has occurred on the port.
- **TEST-OK** - when the port is generating any test pattern a green light indicates the test was ok. When the port is receiving a 2047 test pattern a green light indicates the test was ok.
- **READY** - green indicates the module is powered up and on-line.

The Quad High Speed Interface Module provides the electrical interface for four high speed ports. The electrical interface for each port can be configured independently for RS-232, V.35 or RS-422 at the system console. Each of the ports has a DB25 female connector to terminate the I/O cable from the attached device. The connectors are wired according to EIA-530 for a DCE device. Cables are available for adaptation from the Quad High Speed rear interface DB25 female connector to RS-232, V.35 or RS-422 connectors as required. Operational mode of the Quad High Speed is fixed as DCE emulation.

Thumb screws are provided at the top and bottom of the bezels to secure the module in the chassis and to make an electrical connection to frame ground for FCC emission compliance. The electrical connection to frame ground also protects the module from static discharge.

➡ **NOTE:**
The N + 1 Protection Switch does not supply redundancy for the Test Access module set.

Figure 16-1. Test Access Application/Interface Module Set

Regulatory Information

North America

The Test Access Module is designed to comply with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the Interface Module must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus is designed to meet all requirements of the Canadian Interference-Causing Equipment Regulations.

Product Safety

This equipment is designed to meet the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Europe

This equipment is designed to conform with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

following the provisions of the EMC directive 89/336/EEC, and the Low voltage directive 73/23/EEC.

Before You Begin

- This chapter is written for ADMINISTRATOR-level users.
 - A slot must first be configured for the module type and the TAM module must be resident in a slot in the equipment nest. A Quad RS530 High Speed interface module must also be resident in the same numbered slot as the TAM application module. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4 of this manual.
 - A connection map must first be configured in order to execute and/or monitor test connections via the TAM board. Refer to Chapter 5 of this manual to activate and configure connections maps.
 - For cabling and interface requirements, see Appendix B.
-

Slot Configuration

To configure a slot for the Test Access Module:

1. From the *DACS II AX Main Menu*, place your cursor on the *System Configuration* field and press **<Enter>**, the following menu appears:

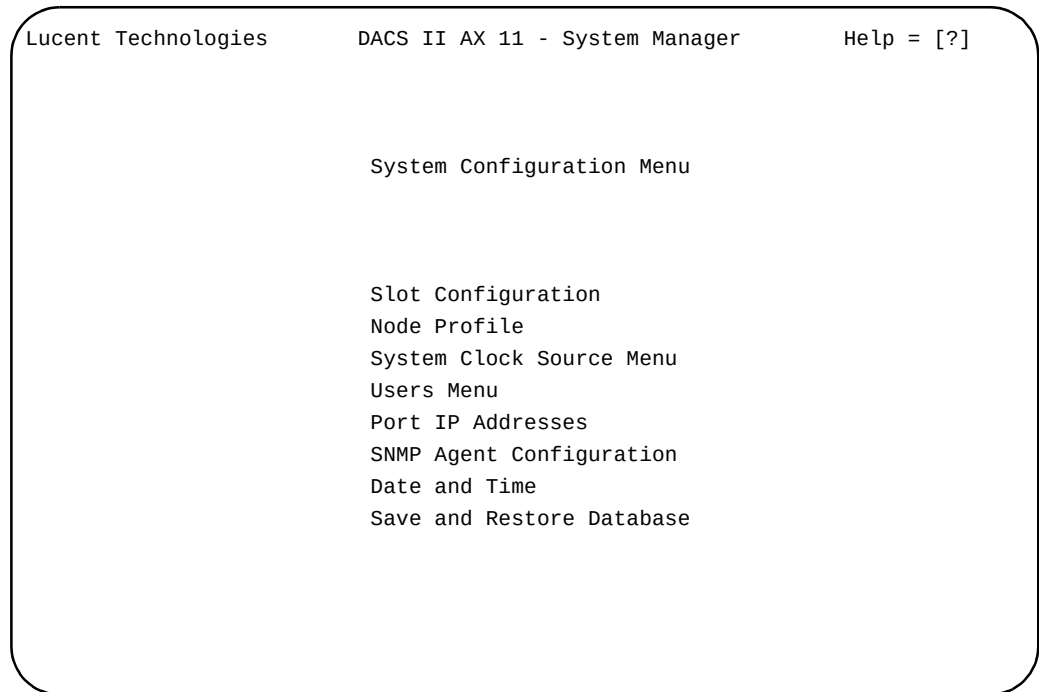


Figure 16-2. System Configuration Menu

1. Press **<Enter>** at the *Slot Configuration* field. The *Slot Configuration* menu appears displaying slots numbered from 1 to 4 (DACS II AX-4) or 1 to 11 (DACS II AX-11).

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
----	-----	-----	-----
1	Octal T1/E1	slot 1	Enable
2	Octal High Speed	slot 2	Disable
3	Octal Voice	slot 3	Disable
4	Octal T1/E1	slot 4	Enable
5	Octal Voice	slot 5	Disable
6	Octal Voice	slot 6	Disable
7	Octal T1/E1	slot 7	Enable
8	Octal Voice	slot 8	Disable
9	Quad T1	Slot 9	Disable
10	Test Access	Slot 10	Disable
11	QUAD OCU	Slot 11	Disable

N+1 Redundancy: Enable
N+1 Redundancy Switchover: Automatic
N+1 Redundancy Restore: Manual

Change Card = [Enter key] [D]elete Card

Figure 16-3. Slot Configuration Menu

1. Place your cursor on the desired slot number, where your Test Access Module will reside, and press **<Enter>**. The *Slot Configuration* submenu appears.

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
Slot Configuration  
  
Slot name: Slot 10  
Card type: Test Access  
Redundancy: Disable
```

Figure 16-4. Slot Configuration Submenu

2. At the *Slot Configuration* submenu, place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number and press **<Enter>** again.
3. Move your cursor to the *Card Type* field and press **<Enter>** key until “*Test Access*” is displayed.
4. Press **X** to save your configuration and return to the previous menu.



NOTE:

The same procedure applies when replacing an existing card in a slot.

**Delete Slot
Configuration**

If you opt to delete a card, remove the card first. Press **D** (*Slot Configuration Menu*) and a message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel.

**NOTE:**

If you do not remove the card prior to pressing D, the following message appears: "-ALERT!- Can not delete a device that is present."

**Configure
Connection Map
for TAM**

To configure Connection Maps for the Test Access Module:

A connection map must first be configured in order to execute and/or monitor test connections via the TAM board. After testing or monitoring the connections, you must restore/reset the connections to their original configuration.

The speed is set when adding a connection in the Add New Connection Menu. The Test id and the location of the TAM board (TESTER slot.port field) are set in the Test Connection Menu.

When asked for a choice of voice or data in the Add New Connection Menu and the listen option, you must choose data. The TAM only executes and/or monitors test data patterns at 48 Kbps to 2.048 Mbps.

Refer to Chapter 5 for information on cross-connect maps and setting up a test for a cross-connection.

Test Access Main Menu

Access Test Access Main Menu To access the Test Access Main Menu:

1. From the *DACS II AX Main Menu*, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
Standby SMC not present          N+1 Redundancy State: Enabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#   Configured Type   Device State   Alarm
-----
01      + Octal T1/E1     Standby       None
02      Quad High Speed   Online        None
03      Octal Voice       Online        None
04      + Octal T1/E1     Online        None
05      Octal Voice       Online        None
06      Octal Voice       Online        None
07      Octal T1/E1       Online        None
08      Octal Voice       Online        None
09      Quad T1           Online        None
10      Test Access       Online        None
11      Quad OCU          Online        None
SMCA    System Manager A  Online        None
SMCB    System Manager B  Standby       None
PSX     ProtectionSwitch  Online        None

[C]lear error counts  [S]lot Cfg      [E]xpose      [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver [R]estore

```

Figure 16-5. Node Summary Menu

2. Place your cursor on the slot number where the Test Access module is located and press **<Enter>**. The *Test Access Main Menu* appears.

On the Node Summary Menu, the Configured Type must display "Test Access" and the Device State must display "On-line". If the Device State is "Off-line", an alert message is generated.

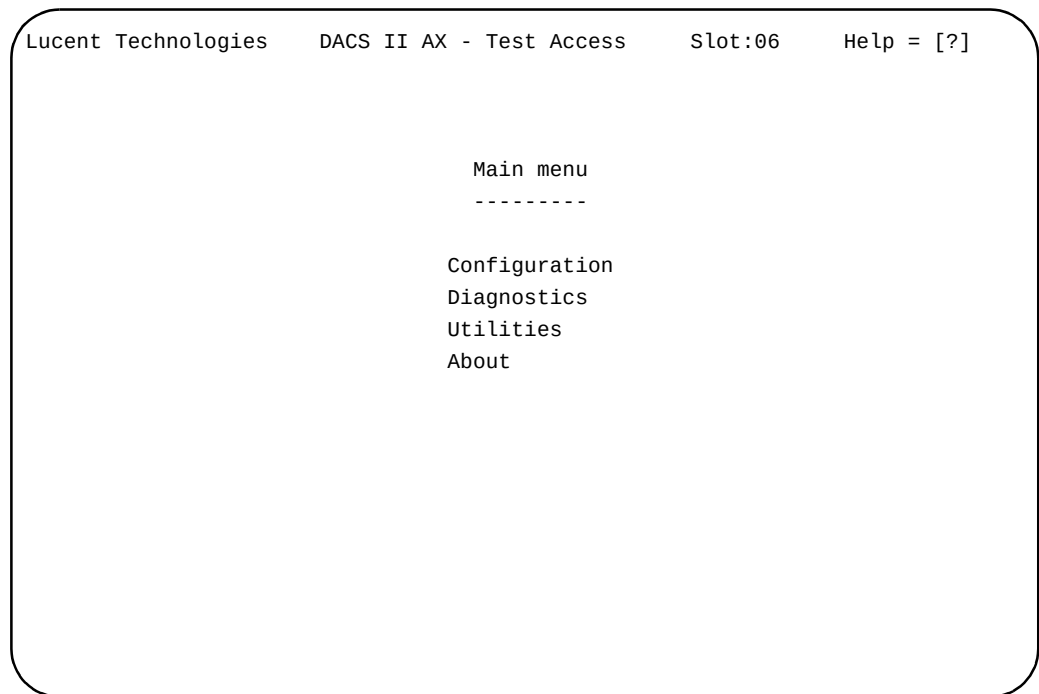


Figure 16-6. TAM Main Menu

From the TAM Main Menu you can configure the module, run diagnostic tests, access utilities, and display module identification (software revision levels).

Configuration Menu

The Test Access Module Configuration Menu provides access to the Port Configuration submenu. From here, you can configure the ports. When a Test Access card is replaced, the old configuration is preserved.

Configure TAM Ports

To configure TAM parameters:

1. From the *TAM Main Menu* place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

Lucent Technologies		DACS II AX - Test Access		Slot:10		Help = [?]	
Configuration menu							
Port 1		Port 2		Port 3		Port 4	
Name.....	port name	port name	port name	port name	port name	port name	port name
Speed.....	0	0	0	0	0	0	0
Timing....	Internal	Internal	Internal	Internal	Internal	Internal	Internal
DCD out...	Forced On	Forced On	Forced On	Forced On	Forced On	Forced On	Forced On
DSR out...	Forced On	Forced On	Forced On	Forced On	Forced On	Forced On	Forced On
Data.....	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Clock.....	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Interface:	V.35	V.35	V.35	V.35	V.35	V.35	V.35
V.54 loop:	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled

Figure 16-7. TAM Configuration Menu

2. Configure all parameters for each port. Move your cursor to the field to be configured and press **<Enter>** to toggle between the field's options. Refer to the Configuration Field Descriptions at the end of this section.

3. Press **X** to save changes. The following screen appears:

Lucent Technologies DACS II AX - Test Access Slot:10 Help = [?]

Configuration menu

Port 1	Port 2	Port 3	Port 4
Name.....: Port One	*****		port name
Speed.....: 56000	*	*	0
Timing....: Internal	*	-MESSAGE!-	Internal
DCD out...: Forced On	*	*	Forced On
DSR out...: Forced On	*	*	Forced On
Data.....: Normal	*	Update configuration?	Normal
Clock.....: Normal	*	*	Normal
Interface: RS232	*	*	V.35
V.54 loop: Disabled	*	Are you sure (Y/N)?	Disabled
	*	*	

Figure 16-8. Update Configuration Menu

4. Press **Y** to save changes or press **N** to cancel changes. Either selection returns to the *TAM Main Menu*.

TAM Configuration Menu Field Descriptions

Name: (*text field*) This is a user-defined field. Any name up to 15 characters in length can be entered to identify each port on the TAM. Some users find it beneficial to use circuit numbers to name the ports.

Speed: The TAM operates at a speed of 48 Kbps and multiples of 56/64 Kbps up to 2.048 Mbps. This field is set up in the *Connection Maps Manager Menu* via the *Active Map Menu*. Refer to Chapter 5 of this manual.



NOTE:

Latching loopback sequences can only be performed at 56/64 Kbps.

Timing: The tester interface timing is set to *Internal* and can not be changed. Test equipment attached to the TAM I/O port must accept clocks from the TAM.

DCD Out: (*option field*) The TAM card presents a DCE interface to the attached test equipment. Data Carrier Detect (DCD) can be *forced off* or *forced on*. *Switched* and *Track RTS* are options, however, they are not relevant for test equipment.

DSR Out: (*option field*) Data Set Ready (DSR) can be *forced off* or *forced on*. *Track DTR* is an option but is not relevant for test equipment.

Data: (*option field*) The options are *Normal* or *Inverted*.

Clock: (*option field*) The options are *Normal* or *Inverted*. Initially choose *Normal*. If frequent errors occur at the port, try *Inverted* and check performance.

Normally, the down-going clock edge is in the middle of each bit. When one device sends a clock signal for the data of another device, that data arrives skewed from the clock due to the round trip delay, if the cable is lengthy. When the delay is such that the originating clock's down-going edge is on the edge of the bit returned, the option *Inverted* will correct this condition inside the module. We do not recommended the use of long cables to perform tests.

Interface: (*option field*) The interface options are *V.35*, *RS530/422* and *RS232*.

V.54 Loop: (*option field*) The options are *Enabled* or *Disabled*. Choose *Disabled* because the TAM card does not respond to an incoming V.54 loop.

Diagnostics Menu

The Diagnostics Menu provides access to run local loops and built in BERT options. It also provides access to run 11 latching loopback options only at 56/64 Kbps.

View Diagnostics

To view Diagnostics:

1. From the *TAM Main Menu* place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

Lucent Technologies
DACS II AX - Test Access
Slot:06
Help = [?]

Diagnostic menu

Name:	port name	port name	port name	port name
Local Loop.....:	Off	Off	Off	Off
Remote Loop.....:	Off	Off	Off	Off
BERT.....:	Off	Off	Off	Off
Seconds in test:	0	0	0	0
Local err-secs.:	0	0	0	0
Remote err-secs.:	0	0	0	0
RTS/DCD.....:	Off/Off	Off/Off	Off/Off	Off/Off
DTR/DSR.....:	Off/Off	Off/Off	Off/Off	Off/Off

[C]lear counts
Insert [E]rrors

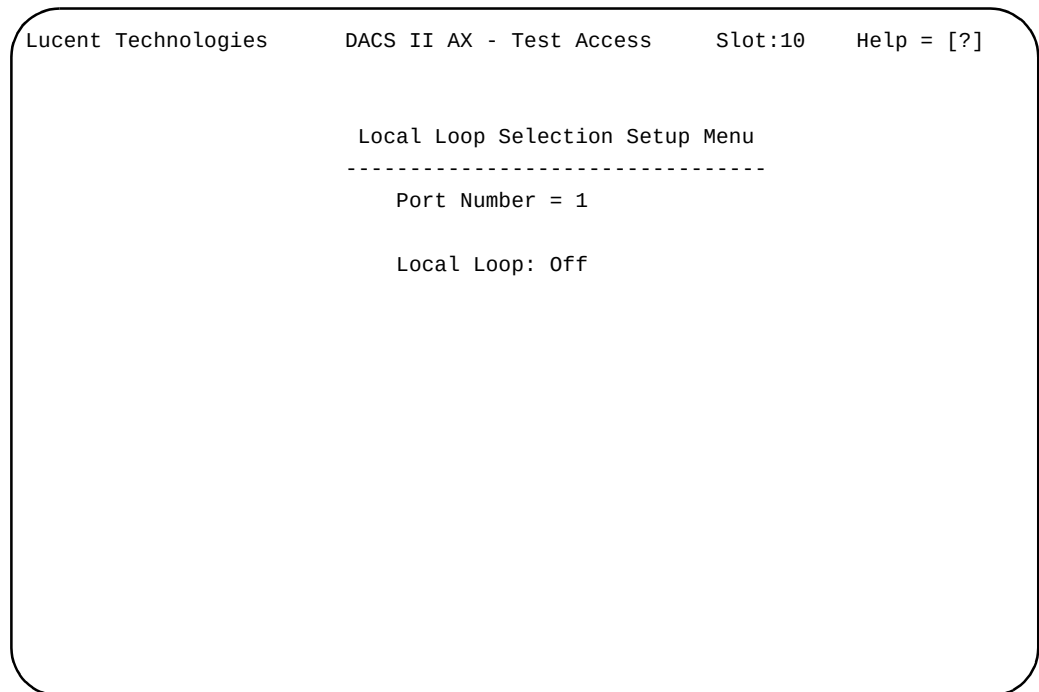
Figure 16-9. Diagnostics Menu

The *Diagnostics Menu* allows you to set Local Loops, Remote Loops and BERT options for each port.

Set Local Loop

To set local loop:

1. From the *Diagnostics Menu*, place your cursor on the *Local Loop* field and press **<Enter>**, the following menu appears:



The screenshot shows a terminal window with a header bar containing 'Lucent Technologies', 'DACS II AX - Test Access', 'Slot:10', and 'Help = [?]'. The main content area displays the 'Local Loop Selection Setup Menu' with a dashed line separator. Below the separator, it shows 'Port Number = 1' and 'Local Loop: Off'.

```
Lucent Technologies    DACS II AX - Test Access    Slot:10    Help = [?]  
  
Local Loop Selection Setup Menu  
-----  
Port Number = 1  
  
Local Loop: Off
```

Figure 16-10. Local Loop Selection Setup Menu

2. Toggle the *Local Loop* field by pressing the **<Enter>** key. Refer to the Diagnostics Field Descriptions at the end of this section for Local Loop descriptions.

1. Press **X** to save changes. The following screen appears:

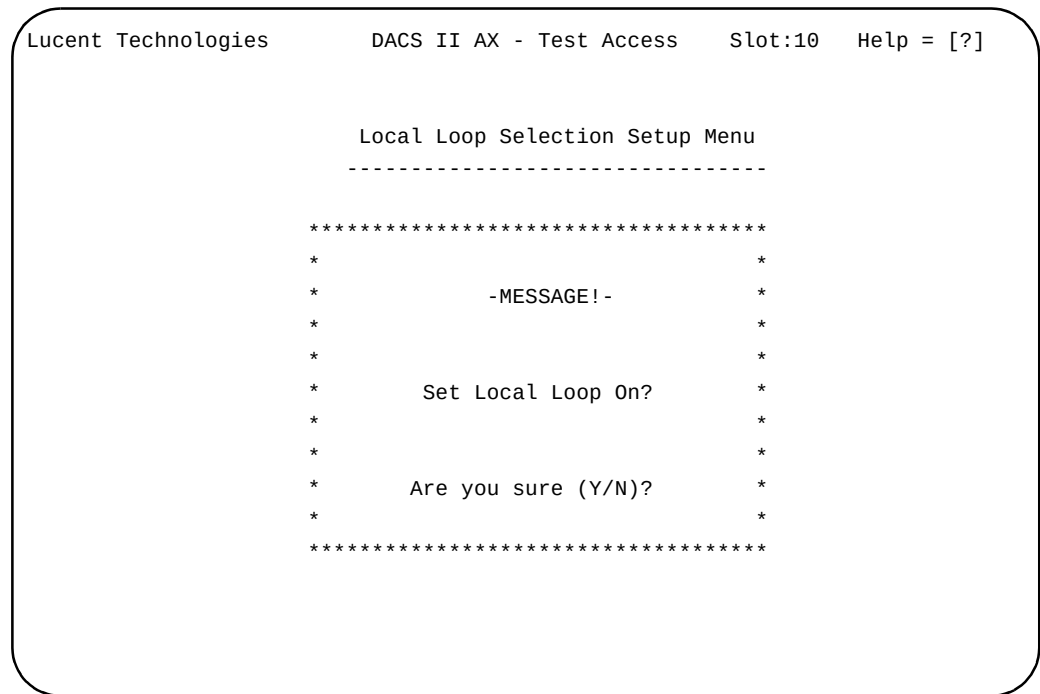


Figure 16-11. Set Local Loop Menu

2. Press **Y** to save changes or press **N** to cancel changes. Either selection returns to the *Diagnostics Menu*.

Set Remote Loop

To set remote loop:

1. From the *Diagnostics Menu*, place your cursor on the *Remote Loop* field and press **<Enter>**, the following menu appears:

```
Lucent Technologies      DACS II AX - Test Access      Slot:10      Help = [?]  
  
                        Remote Loop Selection Setup Menu  
                        -----  
Port Number = 1                      Current Loop State = Off  
  
Remote Loop Cmd.....: Off  
Identical DataPorts.....: 1
```

Figure 16-12. Remote Loop Selection Setup Menu

2. Toggle the *Remote Loop* field by pressing the **<Enter>** key. Refer to the Diagnostics Field Descriptions at the end of this section for Remote Loop descriptions.
3. Place the cursor on the *Identical Data Ports* field. Press the **<Enter>** key to increase the number of dataports, or the **** key to decrease the number of data ports.

4. Press **X** to save changes. The following screen appears when you choose the following options: *Off*, *Latching loop off* and *V.54 Loop Off*.

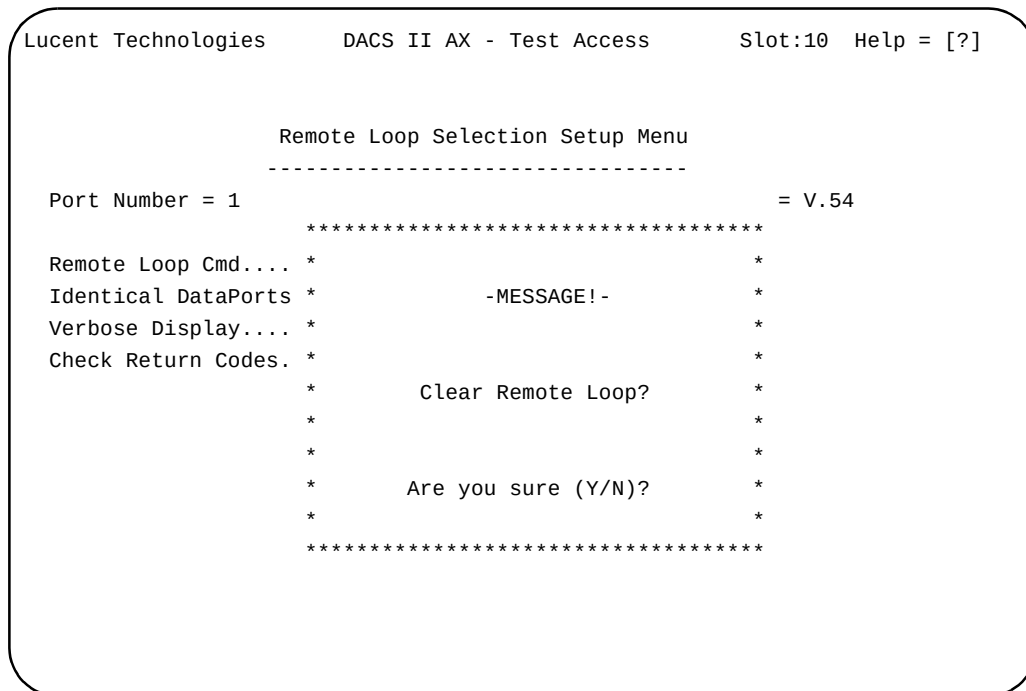


Figure 16-13. Clear Remote Loop Menu

5. Press **Y** to save changes or press **N** to cancel changes.
6. Note any information displayed on the screen and then press any key to return to the *Diagnostics Menu*.

7. For the 11 remaining Remote Loop options, press **X** to save changes and the following screen appears

```
Lucent Technologies      DACS II AX - Test Access      Slot:10      Help = [?]  
  
Remote Loop Selection Setup Menu  
-----  
Port Number = 1                                     = Off  
*****  
Remote Loop Cmd.... *                               *  
Identical DataPorts *           -MESSAGE!-          *  
Verbose Display.... *                               *  
Check Return Codes. *                               *  
*                               *  
*           Set up Remote Loop?                       *  
*                               *  
*                               *  
*           Are you sure (Y/N)?                         *  
*                               *  
*****
```

Figure 16-14. Set Up Remote Loop Menu

8. Press **Y** to save changes or press **N** to cancel changes.
9. Note any information displayed on the screen and then press any key to return to the *Diagnostics Menu*.

Set up BERT

To set up a BERT:

1. From the *Diagnostics Menu*, place your cursor on the *BERT* field and press **<Enter>**, the following menu appears:

```
Lucent Technologies      DACS II AX - Test Access      Slot:10  Help = [?]  
  
      Bit Error Test(BERT) Selection Menu  
      -----  
      Port Number = 1  
  
      Bit Error Test: Off
```

Figure 16-15. Bit Error Test (BERT) Selection Menu

2. Toggle through the BERT options by pressing the **<Enter>** key to move forward or the **** key to move back. Refer to the Diagnostics Field Descriptions at the end of this section for BERT descriptions.

3. Press **X** to save changes. The following screen appears:

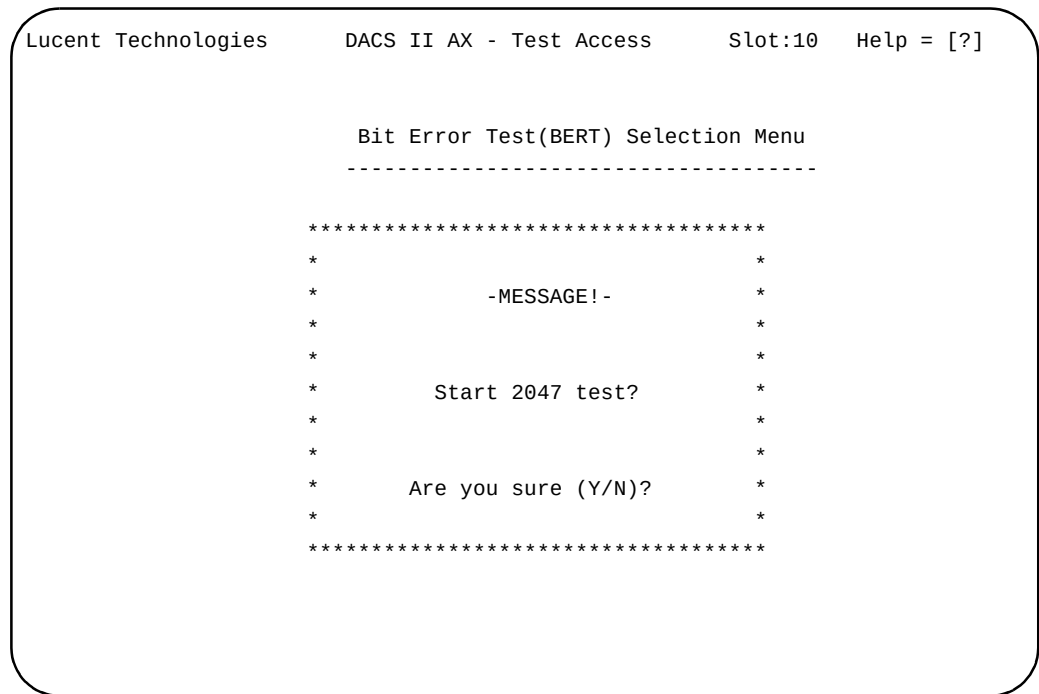


Figure 16-16. Start BERT Test Menu

4. Press **Y** to save changes or press **N** to cancel changes. Either selection returns to the *Diagnostics Menu*.

Diagnostics Field Descriptions

Name: This field displays the name of each port on the TAM.

CONTROLS

Local Loop: (*option field*) When set to *ON*, this parameter causes a bi-directional local loop at the Test Access Module where the command was entered. If you turn the local loop *ON*, the front panel yellow *LOOP* LED will illuminate and local testing can be performed by external test equipment or by the DACS II AX's internal BERT. Only data is looped back. Clocks and control signals are not looped back.



NOTE:

The following latching loopback sequences can be performed only at 56/64 Kbps and with the Test id field of the Test Connection screen set as Split Src or Split Dest.

Remote Loop: (*option field*) Remote Loop controls a remote loopback in a point-to-point circuit. There are several options you can choose from when you select remote loop. They are as follows:

- **Off:** Unloops the previously looped device.
- **Latching loop off:** Unloops any device in latching loopback.
- **V.54 loop off:** Unloops any device in V.54 Loopback.
- **V.54:** Places V.54 responsive device in loopback.
- **Latching CSU:** Punches through repeaters if present and places the CSU in latching loopback.
- **Latching OCU:** Places the OCU in latching loopback.
- **Latching DSU:** Places the DSU in latching loopback.
- **Latching Smart Jack NEI:** Places smart jack in latching loopback.
- **Latching Repeater #1:** Latches the first repeater or smart jack on the loop.
- **Latching Repeater #2:** Latches the second repeater or smart jack after punching through the first.
- **Latching DS0 Data Port Drop Side:** Places the DS0 data port drop side in latching loopback.
- **Latching DS0 Data Port Line Side:** Places the DS0 data port line side in latching loopback.

- **Latching Loop Side Interface:** Places the latching loopback interface in latching loopback.
- **Execute Punch Through Sequence:** Punches through looped repeaters without checking returned codes.

Identical Dataports: (*option field*) The choices are 0 to 125. Number of dataports preceding the data port to be placed in latching loopback. Identical data port number information must be supplied by your local carrier.

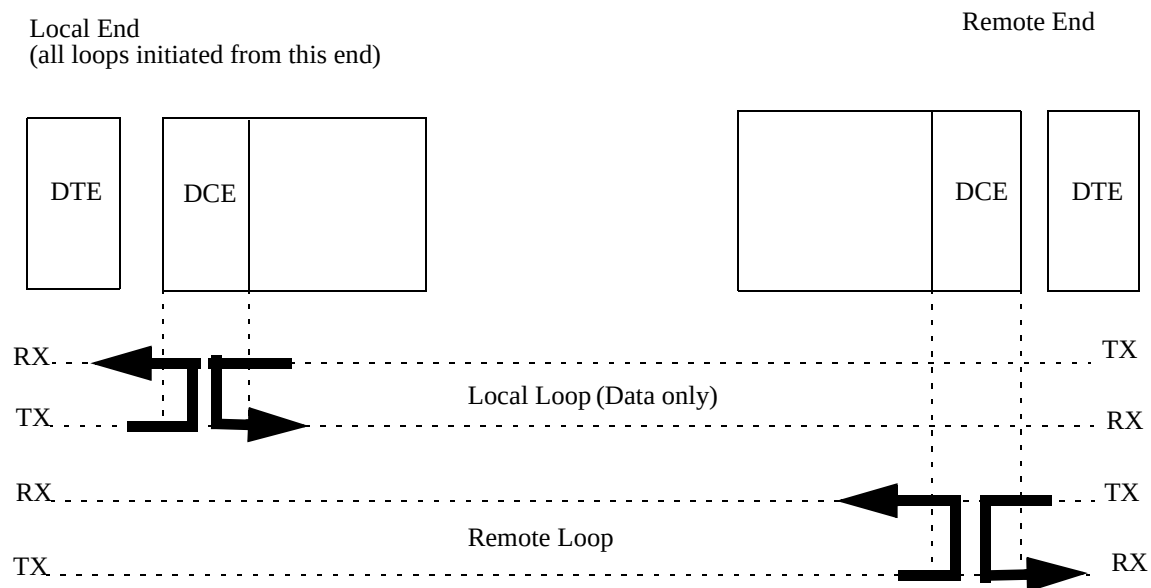


Figure 16-17. Test Access Loops

BERT: (*option field*) This is useful for testing for errors on the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine line quality. The option will either be 2047, All 1's, All 0's or Off.

INDICATORS

Seconds in Test: This read-only count represents the number of seconds the data module was in test.

Local Error Seconds: This read-only count represents the number of local errored seconds that occurred in a one second period while the data module was in test.

Remote Error Seconds: This read-only count represents the number of remote errored seconds that occurred in a one second period while the data module was in test.

RTS: If this indicator is *ON*, TAM is detecting a "Request to Send" signal over its serial port interface.

DCD: If this indicator is *ON*, TAM is detecting a "Data Carrier Detect" signal over its serial port interface.

DTR: If this indicator is *ON*, TAM is detecting a "Data Terminal Ready" signal over its serial port interface.

DSR: If this indicator is *ON*, TAM is detecting a "Data Set Ready" signal over its serial port interface.

COMMANDS:

[C]lear Counters: Clears all counters for the selected port.

Insert [E]rror: Inserts BERT errors.

Utilities Menu

The Utilities Menu provides access to a submenu from which you can reset the TAM card.

Access TAM Utilities

To access the TAM utilities:

1. From the *TAM Main Menu* place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears

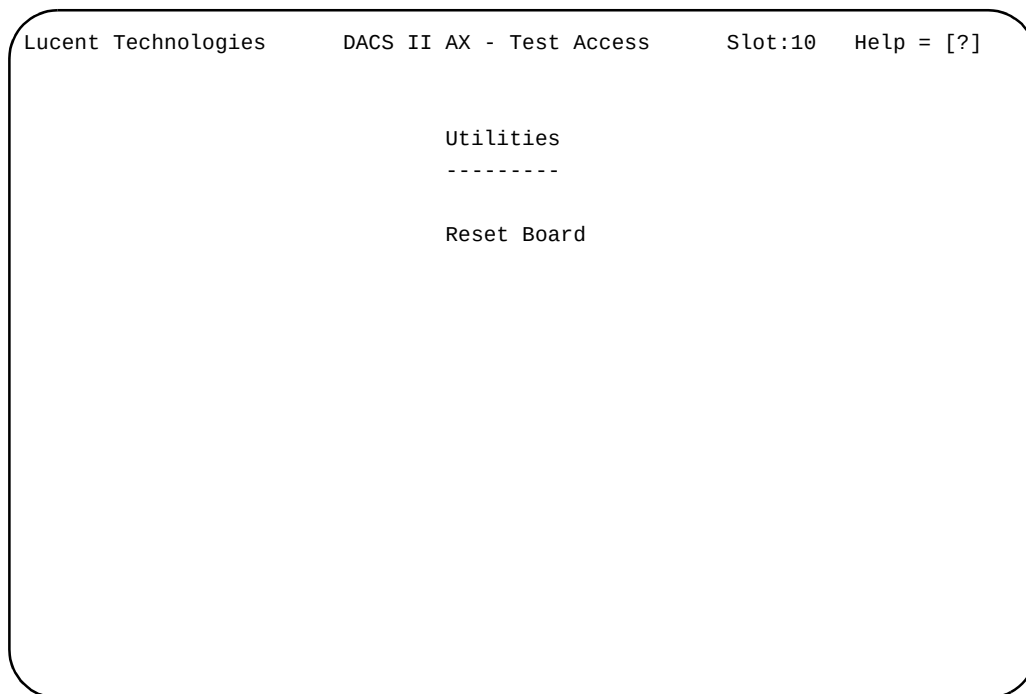


Figure 16-18. TAM Utilities Menu

From the *Utilities Menu*, you can reset the Test Access Module.

Reset Board

**WARNING:**

Resetting the module will cause a loss of data.

To reset the TAM board:

The reset utility causes the TAM card to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

1. From the *TAM Utilities Menu*, place your cursor on the *Reset Board* field and press **<Enter>**. The following screen appears:

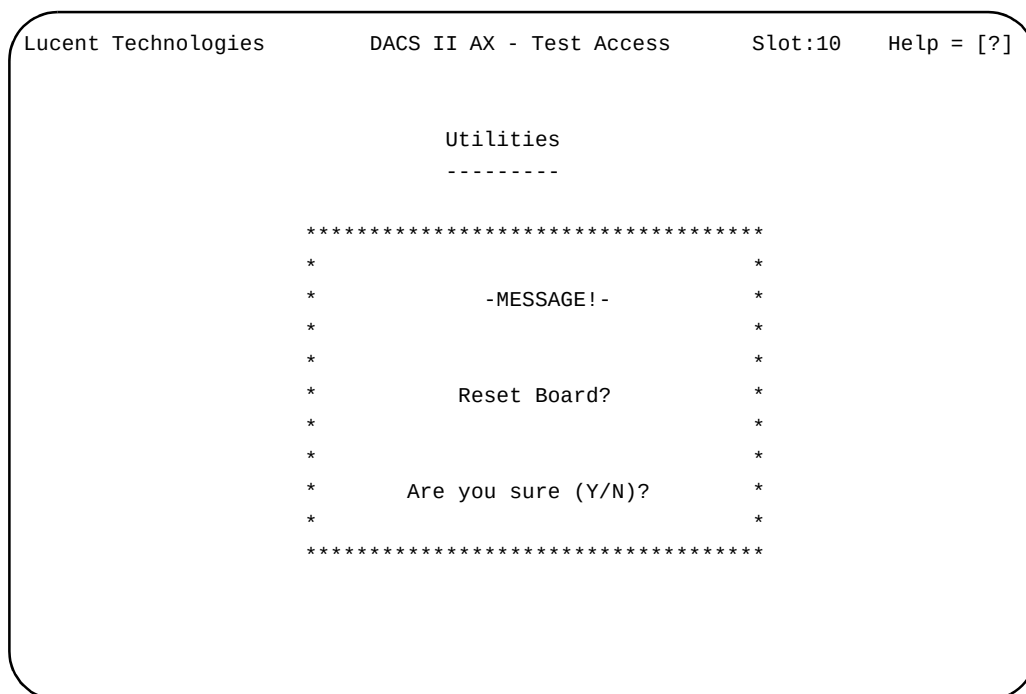


Figure 16-19. Reset Board Screen

2. Press **N** to cancel reset.
3. Press **Y** to reset the board and the next screen appears with the following message: "Alert! Please wait while we establish communications with the system manager! Press any key to continue." After a few seconds you are returned to the *Node Summary Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, the TAM's state may cycle through a combination of "On-line", "Standby", and "Out of Service" and finally "On-line". this is a normal occurrence when the device resets.

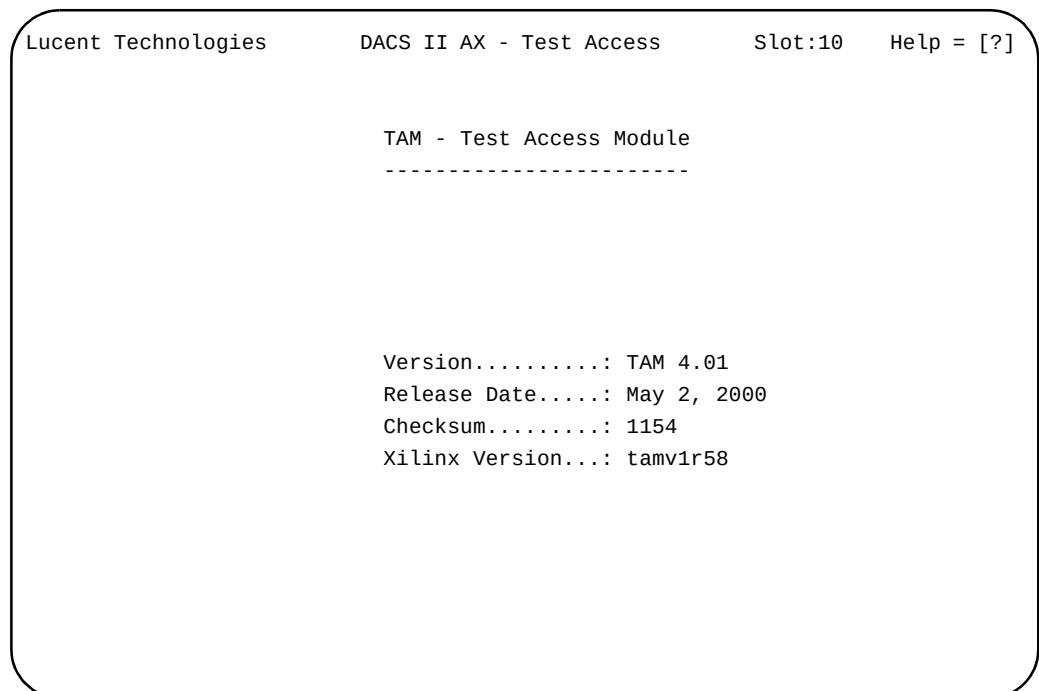
About Menu

The About Menu displays information about the software release and version, and details about the interface module.

Display Identification Information

To display identification information:

1. From the *TAM Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following screen appears:

A screenshot of a terminal window showing the 'TAM - Test Access Module' screen. The window has a title bar with 'Lucent Technologies', 'DACS II AX - Test Access', 'Slot:10', and 'Help = [?]'. The main content area displays the title 'TAM - Test Access Module' followed by a dashed line. Below this, it lists version and release information: 'Version.....: TAM 4.01', 'Release Date.....: May 2, 2000', 'Checksum.....: 1154', and 'Xilinx Version...: tamv1r58'.

```
Lucent Technologies      DACS II AX - Test Access      Slot:10      Help = [?]  
  
TAM - Test Access Module  
-----  
  
Version.....: TAM 4.01  
Release Date.....: May 2, 2000  
Checksum.....: 1154  
Xilinx Version...: tamv1r58
```

Figure 16-20. TAM About Screen

About Field Descriptions

Version: Displays the software version currently residing in the TAM's flash memory.

Release Date: Displays the date of module software release.

Checksum: Displays the sum of all bytes in the TAM's flash memory at power up.

XILINX Version: Displays the hardware version of downloadable, programmable devices.

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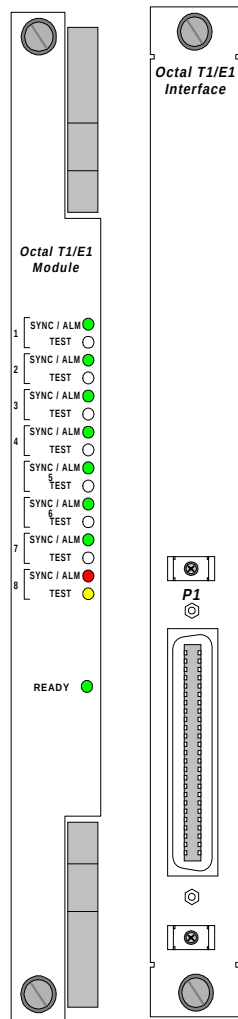
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Introduction

The Octal T1/E1 Module supports up to eight T1 or E1 circuits on a single module. Any port can be configured for either E1 or T1 on the same module. Standard T1 or E1 modes of operation are supported along with extensive diagnostic and testing capabilities. The Octal T1/E1 Module assembly occupies a single backplane slot in the DACS II AX chassis. N+1 Redundancy for this module is available when it is installed in a DACS II AX-11 chassis and configured with the N+1 Protection Switch.

Physical Description



The Octal T1/E1 module set has an Application Module that contains backplane, switching, and framing logic, and an Interface Module which provides electrical interface connection via a 50-pin RJ-48M connector.

There are eight sets of LEDs on the Application Module - one set for each port, and a READY LED.

- **SYNC/ALM** - If this LED is green, it indicates the link is synchronized and functioning properly. If the LED is red, it indicates an error condition exists on the link.
- **TEST** - If this LED is yellow, it indicates diagnostics (BERT or loop) are being performed on the link.
- **READY** - If this LED is green, it indicates power is up.

Thumb screws are provided at the top and bottom of the bezels to secure the modules in the chassis and to make an electrical connection to frame ground for FCC emission compliance. The electrical connection to frame ground also protects the modules from static discharge.



NOTE:

N+1 Redundancy for this module is available when it is utilized in a DACS II AX-11 chassis configured with the N+1 Protection Switch.

Figure 17-1. Octal T1/E1 Application/Interface Module Set

Regulatory Information

North America

The Octal T1/E1 Module complies with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. The drain wire must be attached to one of the two ground lugs available on the rear bezel. The drain wire connection must be kept as short as possible. In addition, the rear card must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

FCC Customer Information

This equipment complies with Part 68 of the FCC rules. On the back or side of this equipment is a label that contains, among other information, the FCC certification number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

For single and two-line connections to the telephone network, the plug and jack used with this equipment must comply with FCC Part 68 rules. See Installation Instructions for details.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes to its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice so you can make the necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact Technical Support. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Type of Interface	1.544 Mbps Digital Channel
Facility Interface	04DU9-BN for SF D4 AMI format without line power
	04DU9-DN for SF D4 B8ZS format without line power
	04DU9-1KN for ANSI ESF AMI format without line power
	04DU9-1SN for ANSI ESF B8ZS format without line power
Service Code	6.0N. Does not provide billing and encoded analog protection. Octal T1/E1 interface card units use an integrated CSU. Affidavit to service provider may be required.
Jack Arrangement	RJ48M
Ringer Equivalence	N/A

Industry Canada Statement

NOTICE: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee that 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. 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 coordinated by a representative 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 utility, 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.

NOTICE: The **Ringer Equivalence Number** (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Product Safety

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Europe

This equipment is in conformity with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

CTR 12/A1

following the provisions of the EMC Directive 89/336/EEC, the Low Voltage Directive 73/23/EEC, and the TTE Directive 91/263/EEC.

Before You Begin

- This chapter is for ADMINISTRATOR-level users.
 - In order to view the menus associated with the Octal T1/E1 Module, a slot must be configured for the module type and the Octal T1/E1 Module must be resident in a slot in the equipment chassis. An Octal T1/E1 Interface Module must also be resident in the same numbered slot as the Octal T1/E1 Application Module. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4.
 - Screens are shown for a DACS II AX with the SMC II module. Although the Octal T1/E1 Module is also supported by SMC I, there will be some screen differences, mainly involving the Slot Configuration Menu, Slot Configuration Submenu, and Node Summary Menu, as well as anything to do with N+1 Redundancy.
 - For cabling and interface requirements, see Appendix B.
-

Cable Tie Mounts

Cable tie mounts are located above and below the RJ-48M connector on the Octal T1/E1 rear interface module (Figure 17-2). Tie-wraps are provided to securely hold the plug in the RJ-48M connector.

The cable tie mount *above* the connector is used to attach a tie-wrap around an interface cable that feeds down from the N+1 Protection Switch (DACS II AX-11 units only). The cable tie mount *below* the connector is used to attach a tie-wrap around a standard interface cable that feeds from below the DACS II AX. Additionally, the opposite side of the plug should be fastened to the matching stand-off using the screw attached to the plug.

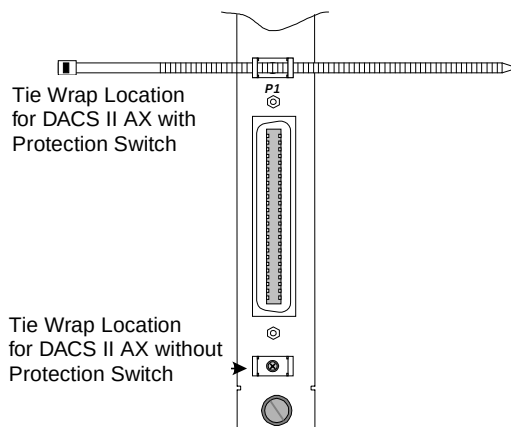


Figure 17-2. Tie-Wrap Attachment Locations

Slot Configuration

To configure a slot for the Octal T1/E1 Module:

1. From the *DACS II AX Main Menu*, scroll down to the *System Configuration* field and press **<Enter>**. The following menu appears:

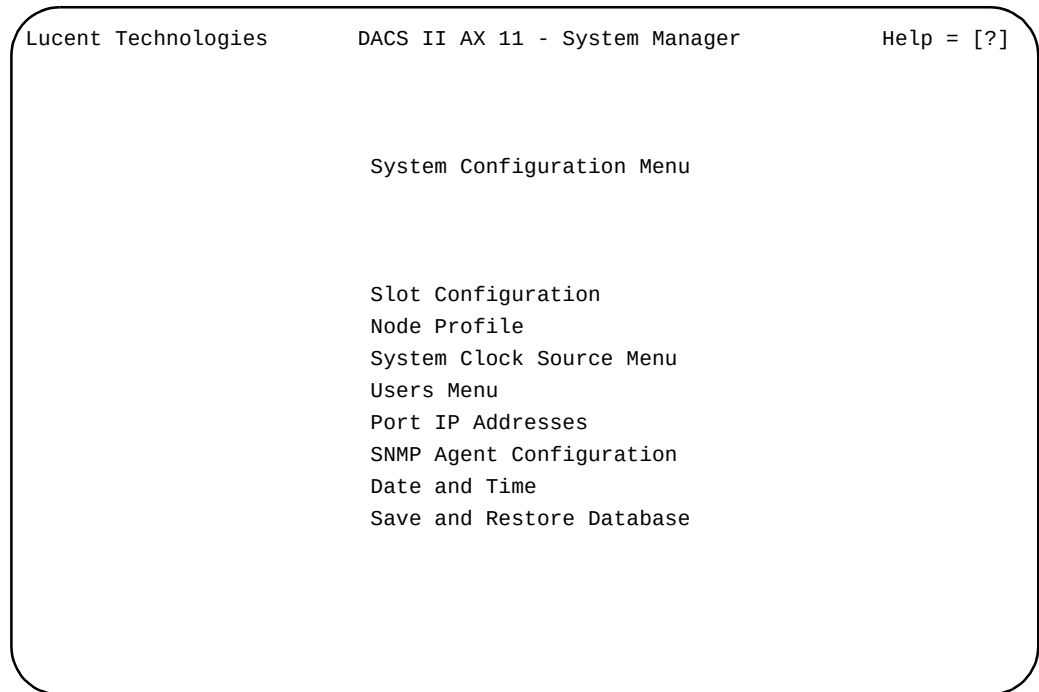


Figure 17-3. System Configuration Menu

2. Then place your cursor on the *Slot Configuration* field and press **<Enter>**. The following menu appears, displaying slots numbered from 1 to 4 (DACS II AX-4) or from 1 to 11 (DACS II AX-11):

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1	Standby Lnk	Enable
2	Octal T1/E1	Data Loop 1	Enable
3	Octal T1/E1	Data Loop 2	Enable
4	Octal T1/E1	Data Loop 3	Enable
5	Octal T1/E1	Data Loop 4	Enable
6	Octal T1/E1	Data Loop 5	Enable
7	Quad T1	T1	Disable
8	Quad OCU	OCU	Disable
9	Router	Router	Disable
10	T3	T3 Link	Enable
11	T3	T3 Standby	Enable

N+1 Redundancy: Enable
N+1 Redundancy Switchover: Automatic
N+1 Redundancy Restore: Manual

Change Card = [Enter key] [D]elete Card

Figure 17-4. Slot Configuration Menu**NOTE:**

The N+1 Redundancy fields in the Slot Configuration Menu are not displayed if you are using a DACS II AX-4.

3. Move your cursor to the slot number where the Octal T1/E1 module will reside, and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX 11 - System Manager Help = [?]

Slot Configuration

Slot name: slot 1
Card type: Octal T1/E1
Redundancy: Enable

Figure 17-5. Slot Configuration Submenu

4. Place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number of up to 11 characters and press **<Enter>** again.
5. Move your cursor to the *Card Type* field and press the **<Enter>** key until "Octal T1/E1" is displayed.
6. For DACS II AX-11 units with the N+1 Protection Switch, move your cursor to the *Redundancy* field to *Enable* or *Disable* redundancy as desired (not configurable for DACS II AX-4).
7. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.
8. The same procedure applies when replacing an existing card in a slot. If you opt to delete a card, remove the card first. Then press **D** (Slot Configuration Menu) and a message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel.



NOTE:

The same procedure applies when replacing an existing card in a slot.

**Deleting a Slot
Configuration**

If you decide to delete a card, remove the card first. Then press **D** (Slot Configuration Menu) and a message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel. If you do not remove the card prior to pressing D, the following message appears: "-ALERT!- Can not delete a device that is present."

Main Menu

Access Main Menu To access the Main Menu:

1. From the *DACS II AX Main Menu*, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
Standby SMC not present      N+1 Redundancy State: Enabled
Audio Alarm.....: Enabled

                                Node Summary Menu

Slot#  Configured Type  Device State  Alarm
-----
01     + Octal T1/E1    Standby      None
02     + Octal T1/E1    Online       *None
03     + Octal T1/E1    Online       *None
04     Quad High Speed  Online       None
05     Octal Voice      Online       None
06     Octal Voice      Online       None
07     Quad T1          Online       None
08     Test Access      Online       None
09     + T3              Online       None      Clock Src
10     + T3              Online       None
11     + T3              Standby      None
SMCA    System Manager A Online       None
SMCB    System Manager B Not Present  None
PSX     ProtectionSwitch Online       None

[C]lear error counts  [S]lot Cfg      [E]xpose  [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver  [R]estore

```

Figure 17-6. Node Summary Menu

2. Then place your cursor on the slot number where the Octal T1/E1 module is located and press **<Enter>**. The *Main Menu* appears.



NOTE:

On the Node Summary Menu, the Configured Type must display “Octal T1/E1” and the Device State must display “On-line” or “Standby” in order to access the Octal T1/E1 Module Main Menu. If the Device State is “Off-line”, an alert message is generated. You should not configure the standby card.

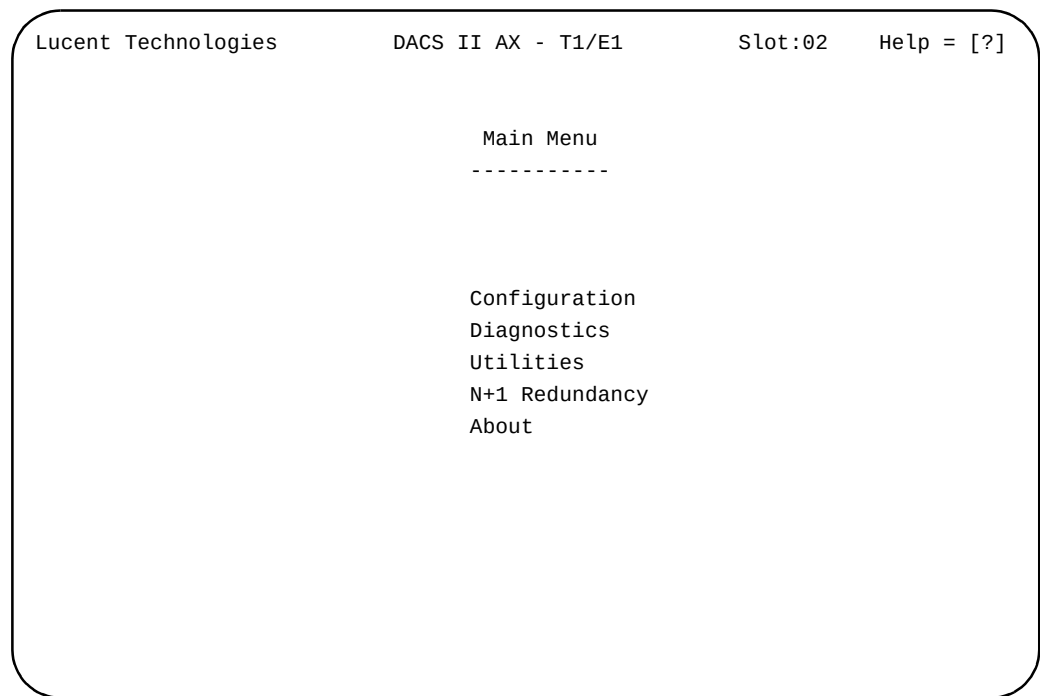


Figure 17-7. Octal T1/E1 Main Menu

From the Octal T1/E1 *Main Menu* you can configure the module, run diagnostic tests, access utilities, view N+1 Redundancy status (DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware Configuration Menu

The Configuration Menu provides access to a submenu from which each of the eight T1 or E1 links can be configured.

⇒ NOTE:
The Octal T1/E1 configuration files are stored on the System Manager Card. When an Octal T1/E1 card is replaced, the old configuration is preserved.

**Configure T1/E1
Links**

To configure the T1/E1 Links:

From the *Main Menu*, place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies      DACS II AX - T1/E1      Slot:02      Help = [?]

                                Links Configuration
                                -----
Link Name      Framing      FDL      LH/LBO      Network  Yel  Idle
              Loop      Alarm  Code
-----
01 Number One      T1 ESF B8ZS      54016      0.0db      Disable  No   Busy
02 Naples          E1              S-Haul      Enable  Yes  Idle
03 Philadelphia    T1 ESF AMI 62411 54016      15.0db     Disable  No   Busy
04 Circuit Number  Out Of Service
05 Circuit Number  Out Of Service
06 Circuit Number  Out Of Service
07 Circuit Number  Out Of Service
08 Circuit Number  Out Of Service

LH - long haul      LBO - line build out[T1 only]      FDL - facility data link
  
```

Figure 17-8. Links Configuration Menu

To change a parameter for an individual link, move your cursor to the applicable link number field and press **<Enter>**. The following menu appears:

```
Lucent Technologies      DACS II AX - T1/E1      Slot:02      Help = [?]  
  
                        Link Configuration  
                        -----  
  
Link Nbr.....: 1  
Name.....: Number One  
Status.....: In Service  
Recover Time..: 3 seconds  
Clear T1/E1...: Disabled  
LineType.....: T1 ESF B8ZS  
Network Loop..: Disabled  
Yellow alarm..: No  
Unused DS0's..: Busy  
ESF format....: 54016  
LBO.....: 0.0db <> Long Haul
```

Figure 17-9. Link Configuration Entry Submenu

3. Use the field descriptions on the following pages to configure the links. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *Links Configuration* submenu.
4. Configure another link, or when all links are configured, press **X** to return to the *Configuration Menu*.

Link Configuration Field Descriptions

The following fields appear on the Octal T1/E1 Link Configuration menu (Figure 17-8).

Link Nbr (Link Number): Displays the link number selected from the *Links Configuration* menu, from 1 - 8.

Name: (*text field*) This is a user-defined field. Any name up to 20 alphanumeric characters long can be entered to identify each link on the Octal T1/E1 Module. You may find it beneficial to use circuit numbers to name the links.

Status: (*option field*) This field determines the status of the link. The status will either be *In Service* or *Out of Service*.

- In Service - an operational link that shows a valid configuration has been set up. When the link is Active or In Service you can run diagnostics.
- Out of Service - a mechanism to avoid getting alarms. Out of Service also causes the link to be Inactive and you cannot run Diagnostics.

Recover Time: (*option field*) This field is used to specify how quickly Red/Yellow alarms are cleared following the recovery of the given T1 facility (e.g., valid signal and framing present). Select either 3, 10, or 15 seconds.

Clear T1/E1: (*option field*) "Clear" refers to a condition where the module passes data through without reformatting it in any way (essentially, the module acts the same as a wire). Selecting *Framed* allows alarms and statistics to be displayed, while *Unframed* passes data without keeping track of alarms and statistics except for LOS and BPV. *Disabled* turns off Clear mode.



NOTE:

When using Clear T1 mode, make the connection ensuring that 25 DS0s have connections mapped (see Chapter 5 for details on connection mapping). This is necessary because of the way Clear T1 mode operates, taking the framing bits from the first 24 DS0s and sending them all out through the 25th DS0.

Line Type: (*option field*) This field determines the type of framing used on the line. When *Clear T1/E1* is set to *Framed* or *Disabled*, the available line types are as follows:

- E1
- E1-CRC
- E1-CAS
- E1 CAS-CRC
- T1-ESF B8ZS
- T1-ESF AMI 62411
- T1 D4 B8ZS
- T1 D4 AMI 62411



NOTE:

The L-Haul and S-Haul line interface options are available with E1 line types, and the LBO (Line Build Out) option field is available with T1 line types.



NOTE:

When *Clear T1/E1* is set to *Unframed*, the available line types will be T1 AMI, T1 B8ZS, or E1.

Network Loop: (*option field*) This entry determines the module's ability to respond to loop diagnostic commands received from the network supplier. *Enabled* allows the network supplier to put the Octal T1/E1 module in a loopback state, while *Disabled* does not allow this to happen.

Yellow Alarm: (*option field*) *Yes* causes the module to discard data and send a "yellow alarm" if it is in a "red alarm" condition after a three second period. *Yes* must be chosen if the network supplier is a common carrier, such as a telephone company.

Unused DS0s: (*option field*) This entry is used to select the state of unused DS0s as either *Busy* (All Ones) or *Idle* (0).

ESF Format: (*option field*) This entry describes the types of ESF network commands to which the Octal T1/E1 module responds, and is not applicable to D4 networks. This information must be obtained from the network supplier. Choose between *54016* (AT&T Technical Reference 54016) and *T1.403* (ANSI specification T1.403).

Long Haul: (*E1 option field*) *L-Haul* (Long Haul) is the physical interface selection for long connection to E1 equipment, while *S-Haul* (Short Haul) is the physical interface selection for co-located E1 equipment.

**NOTE:**

The Long Haul and Short Haul line interface options are available only with E1 line types. Long Haul/Short Haul designations for E1 are defined by authentication of signal presented to the receiving circuitry, not by cable length. Short Haul is defined as 0 to -6db, and Long Haul as 0 to -34db. This loss is related to cable type and cable length.

LBO (Line Build Out): (T1 option field) this field sets the line attenuation level, and should be set to 0 dB (no attenuation) unless the network supplier specifically requests otherwise. 0.0db through 22.5db = long haul; 0-133 Ft. through 655 Ft. = short haul. The available settings are:

- 0.0db <> Long Haul
- 7.5db <> Long Haul
- 15.0db <> Long Haul
- 22.5db <> Long Haul
- 0-133 Ft. <> Short Haul
- 133-266 Ft. <> Short Haul
- 266-399 Ft. <> Short Haul
- 399-533 Ft. <> Short Haul
- 533-655 Ft. <> Short Haul

**NOTE:**

The LBO (Line Build Out) option field is available only with T1 line types.

Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks and built-in BERT. It also provides access to several screens which are used to display link statistics.

There are multiple loopback options. Each of the eight T1/E1 links can be independently looped back. Loopbacks can occur towards the line or towards the backplane. Loop types are shown in Figure 17-14.

The built-in BERT tests can be used along with loopbacks to test and determine the status of the Octal T1/E1 links. They may also be used in conjunction with diagnostic facilities on other DACS II AX cards to qualify operation of the backplane connections.

Set Up Diagnostic Tests

To set up Diagnostic Tests:

From the *Main Menu*, place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

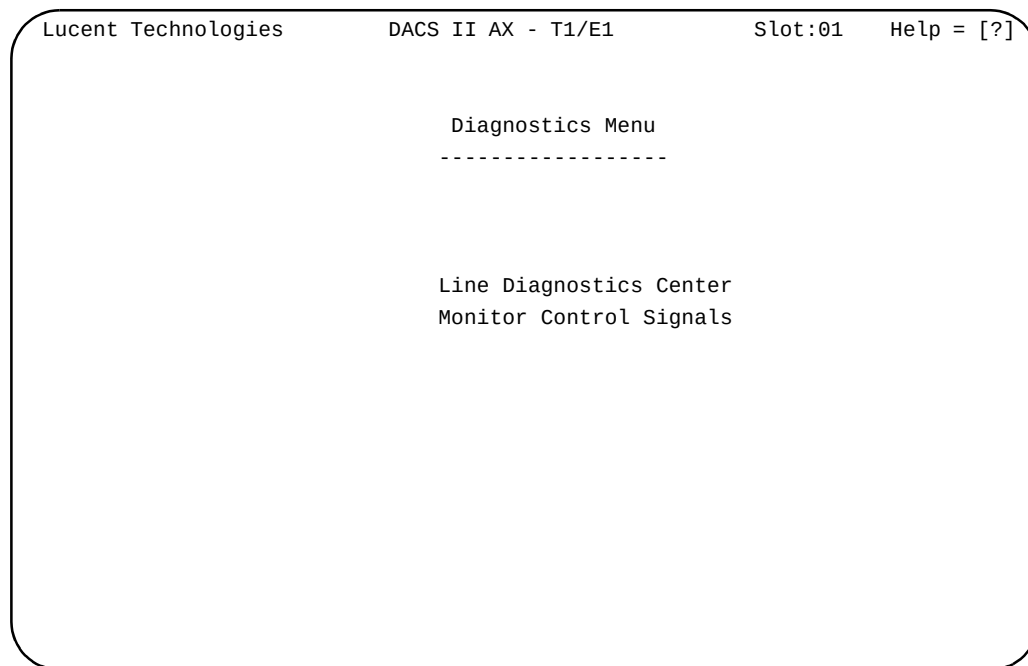


Figure 17-10. Diagnostic Menu

From the *Diagnostics Menu*, place your cursor on the *Line Diagnostics Center* field and press **<Enter>**. The following submenu appears:

```

Lucent Technologies          DACS II AX - T1/E1          Slot:01    Help = [?]

                                Diagnostics Manager
                                -----
Link Name      State      Errored Link      Bkpln      Test      Local
                Seconds Loop      Loop      Bert      Duration Errors
-----
Number One     *ERROR*    2893    Off      Off      Off      0      0
Naples         OK         6       Off      Off      Off      0      0
Philadelph    OK         0       Off      Off      Off      0      0
Circuit Num    Inactive   0       Off      Off      Off      0      0
Circuit Num    Inactive   0       Off      Off      Off      0      0
Circuit Num    Inactive   0       Off      Off      Off      0      0
Circuit Num    Inactive   0       Off      Off      Off      0      0
Circuit Num    Inactive   0       Off      Off      Off      0      0

[B]ert  [L]oop  [E]xpose  [C]lear Error Counters
ESF [S]tatistics ESF [R]egisters    [G].826

----- Hit key 1 thru 9 to insert an error -----
[1]CAS Multiframe    [2]Multiframe          [3]PRBS      [4]FBit
[5]Frame Alignment   [6]Line Code Violation [7]Bit Slip   [8]CRC  [9] All

```

Figure 17-11. Diagnostics Manager Submenu

Diagnostics Manager Field Descriptions

The following fields appear on the Diagnostics Manager menu (Figure 17-11).

Link Name: This field displays the link name entered from the *Configuration Menu*.

State: This field displays the link's current status as *OK* (in service), *Inactive* (out of service) or **ERROR** if there is more than one error.

Errored Seconds: The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This is normally an indication that something went wrong on the line. This field displays the number of errored seconds that have occurred since the last counter reset.

Link Loop: Reflects the status of all the loopbacks associated with the link.

Backplane Loop: Loops a data connection from the backplane to the link. A backplane loop will provide complete port testing to the backplane and back to the T1/E1 line under test. Only cross-connected DS0s are looped on the backplane. Note that a user connection must already be in place prior to invoking this loopback.

Bert: When BERT is enabled, indicates the selected pseudo-random pattern.

Test Duration: Once the BERT test is started, the length of the test is measured.

Local Errors: Displays the number of errors that occurred during the test.

Begin Diagnostic Test

To begin a diagnostic test:

The following diagnostic tests can be run on the module and links. These tests can be run by pressing one of the following *hot keys*:

- **[B] = Bert:** Displays pseudo-random test patterns.
- **[L] = Loop:** Allows you to set different loopbacks.
- **Keys [1] through [9]:** Used to insert errors from the NI side, which should be detected on the remote side. If the remote side is line looped, the inserted errors should be seen on the local side, under Local Errors or Errored Seconds.

Detailed procedures are provided on the following pages.

Display Statistics and Link Status

To display Statistics and Link Status:

The following *hot keys* can be used to display statistics and link status:

- **[E] = Expose:** Displays the status of the line.
- **[C] = Clear Error Counters:** Clears all errored second and BERT counters.
- **[S] = ESF Statistics:** The ESF Statistics Menu displays current and 24-hour statistics for the specific ESF link.
- **[R] = ESF Registers:** The ESF Registers Display gives the same information as the ESF Statistics Menu but it is broken down by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period.
- **[G] = G.826 Statistics:** Displays the statistics of the performance of the link for the duration or set interval of time the link is up and running.

Detailed procedures for viewing statistics are provided following the diagnostic procedures.

Bit Error Rate Tests (BERT)

BERT is useful for testing the bit error rate of the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine transmission line quality. If a pattern match cannot be found, Errored Seconds counts are incremented to record the time during which a pattern lock in the receive path could not be established. For troubleshooting purposes, combining BERT with diagnostic loops is very useful in isolating problems within a circuit. The *BERT Select* submenu has a list of several test patterns that you can choose.

Procedure

To perform a Bit Error Rate Test (BERT):

Place your cursor on an *Active* link in the *Diagnostics Manager* submenu and press **B**. The following submenu appears:

```

Lucent Technologies      DACS II AX - Octal T1/E1      Slot:02      Help = [?]

                                BERT Select
                                -----
                                Link Number...: 3
                                Link Name....: windsor
                                Current BERT.: Off
                                New BERT.....: Off

Available Bit Error Tests (BERTs)
-----
[0] ff                                [0] All-zeros (0x00)
[1] All-Ones (0xFF)
[2] Unframed 2047                    [B] Framed 2047
[3] Unframed 2^15                    [C] Framed 2^15
[4] Unframed 2^20                    [D] Framed 2^20
[5] Unframed 2^23                    [E] Framed 2^23
[6] Unframed 2^11 - 7 0's limits     [F] Framed 2^11 - 7 0's limits
[7] Unframed 2^15 - 7 0's limits     [G] Framed 2^15 - 7 0's limits
[8] Unframed QRSS                    [H] Framed QRSS
[9] Unframed 2^23 - 14 0's limits    [I] Framed 2^23 - 14 0's limits
  
```

Figure 17-12. Diagnostics BERT Select Submenu

**NOTE:**

Diagnostic Loops should be enabled before enabling BERT.

5. To select a BERT pattern, place the cursor on the *New BERT* field and either press **<Enter>** to cycle through the choices OR press the specific key indicated on the bottom of the menu. The selectable patterns and their corresponding keys are as follows:

- **[O]**ff
- **[1]** All-Ones (0xFF)
- **[2]** Unframed 2047
- **[3]** Unframed 2¹⁵
- **[4]** Unframed 2²⁰
- **[5]** Unframed 2²³
- **[6]** Unframed 2¹¹ - 7 0's limits
- **[7]** Unframed 2¹⁵ - 7 0's limits
- **[8]** Unframed QRSS
- **[9]** Unframed 2²³ - 14 0's limits
- **[0]** All-zeros (0x00)
- **[B]** Framed 2047
- **[C]** Framed 2¹⁵
- **[D]** Framed 2²⁰
- **[E]** Framed 2²³
- **[F]** Framed 2¹¹ - 7 0's limits
- **[G]** Framed 2¹⁵ - 7 0's limits
- **[H]** Framed QRSS
- **[I]** Framed 2²³ - 14 0's limits

Press **X** to start the test. The following screen appears:

```

Lucent Technologies      DACS II AX - T1/E1      Slot:05      Help = [?]

                                BERT Select
                                -----
                                Link Number...: 1
                                Li
                                Cu *****
                                Ne *
                                *
                                *          -MESSAGE!-          *
                                Available Bit Error T *
                                ----- *
                                [0]ff *          Start New Test? *
                                [1] All-Ones (0xFF) *          *
                                [2] Unframed 2047 *          *
                                [3] Unframed 2^15 *          Are you sure (Y/N)? *
                                [4] Unframed 2^20 *          *
                                [5] Unframed 2^23 *****
                                [6] Unframed 2^11 - 7 *          0's limits
                                [7] Unframed 2^15 - 7 0's limits [G] Framed 2^15 - 7 0's limits
                                [8] Unframed QRSS [H] Framed QRSS
                                [9] Unframed 2^23 - 14 0's limits [I] Framed 2^23 - 14 0's limits

```

Figure 17-13. Start New Test Screen

6. Press **Y** to start a new test, or press **N** to cancel.

Stop BERT Test

To stop the BERT Test:

1. From the *Diagnostics Manager* submenu, press **B** and the *BERT Select* submenu appears.
2. With the cursor on the *New BERT* field, press the letter **O**.
3. Press **X**. The message, "*Stop Bit Error Test? Are you sure (Y/N)?*" appears. Press **Y** and the BERT test ends.

Diagnostic Loops

Diagnostic Loops include several types of Network Interface Loops (Local, Line, Analog, Remote, and Payload) as well as a Backplane Loop. Each of the 8 links can be independently looped back. Diagnostic Loops can be enabled from the *Loop Select* submenu. Diagnostic loops are shown in Figure 17-14.

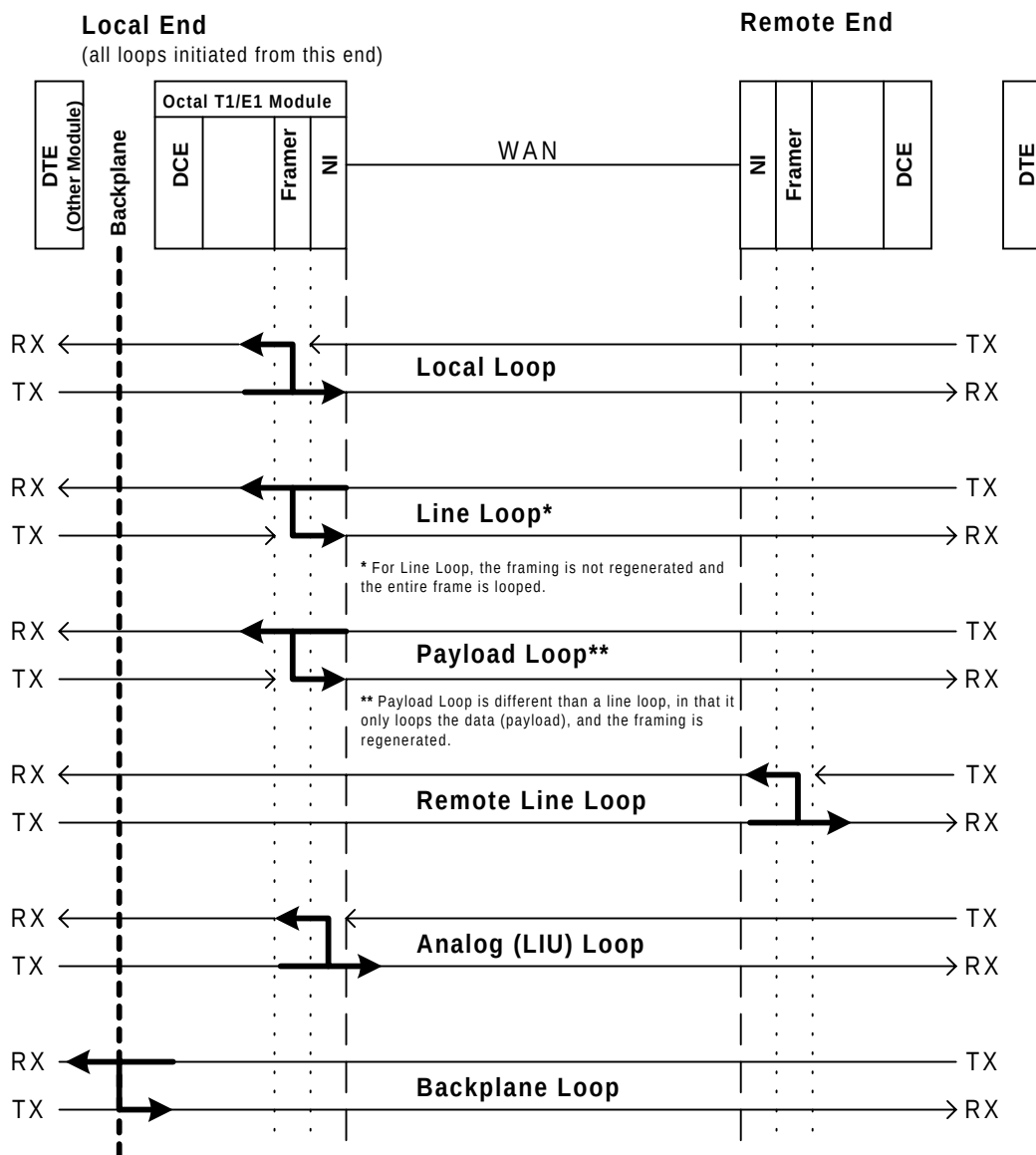


Figure 17-14. Octal T1/E1 Diagnostic Loops

Enable an NI Loop To enable a Network Interface Loop:

From the *Diagnostics Manager* submenu, place your cursor on an active link and press **L**. The following submenu appears:

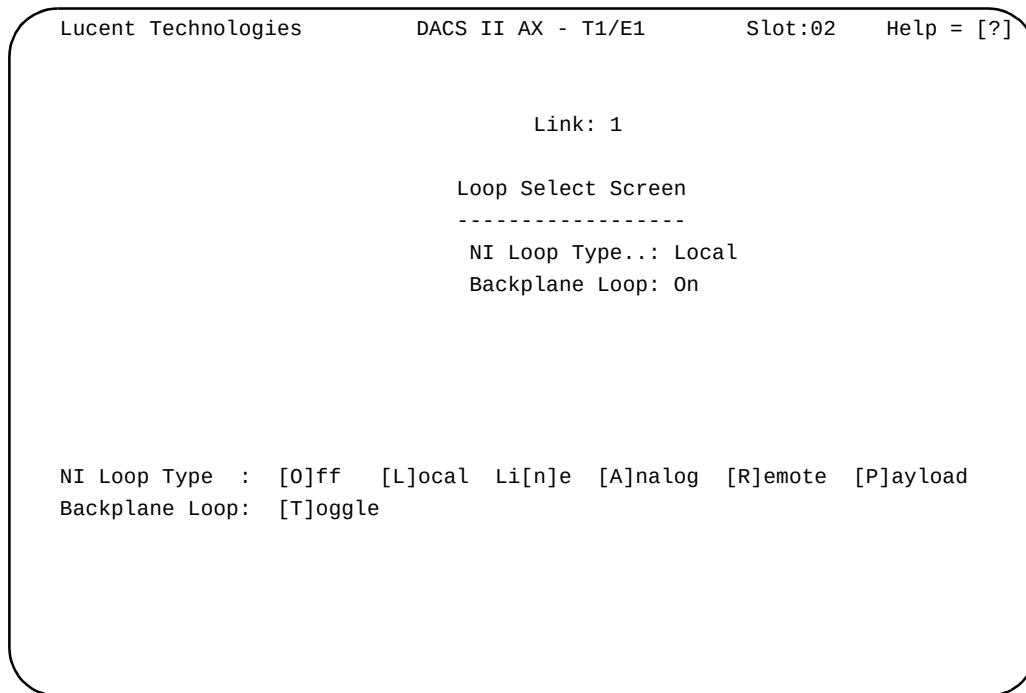


Figure 17-15. Loop Select Submenu

4. To select a specific loop, place the cursor on the *NI Loop* field and either press **<Enter>** to cycle through the choices OR press the specific hot key indicated on the bottom of the menu. The NI Loop hot keys are as follows:
 - **[L]** - for a local loop
 - **[N]** - for a line loop
 - **[A]** - for an analog (LIU) loop
 - **[R]** - for a remote line loop (**not applicable for E1**)
 - **[P]** - for a payload loop

The Backplane Loop is designed to check the integrity of the Backplane and allow testing through the Octal T1/E1 port from the remote side to the backplane and back to the tester. The backplane loop is shown on Figure 17-14.

Enable Backplane Loop

To enable a Backplane Loop:

1. Move your cursor to the *Backplane Loop* field and press **<Enter>** to toggle the backplane loop *On* or *Off*.

**NOTE:**

There must be a connection to another module or to the Octal T1/E1 Module itself mapped on the backplane in order for the backplane loop to function.

T1/E1 Link Status

Procedure

To access the Expose Screen and View the Status of the T1/E1 Link:

The Expose screen displays the real-time or current status of the T1/E1 link.

Place your cursor on any active link in the *Diagnostics Manager* submenu and press **E**. The following submenu appears:

```

Lucent Technologies          DACS II AX - T1/E1          Slot:01    Help = [?]

                                T1/E1 Link Status
                                -----
Link#: 1      Name: Number One
----- State  ErroredSec
Red Alarm    : On      8      Crc  Errors.....: 0
Yellow Alarm : Off     0      Bpv  Errors.....: 0
Loss Of Signal: On     8      Frame Bit Errors...: 0
AIS Indication: Off    0      Trunk Conditioning.: On
Out Of Frame  : On     8
SEF Indication: On     8
Transmit Slip : Off    0
Receive Slip  : Off    1

[C]lear Counters  ESF [S]tatistics  ESF [R]egisters  [G].826  Re[i]nitialize
----- Hit key 1 thru 9 to insert an error -----
[1]CAS Multiframe  [2]Multiframe          [3]PRBS      [4]FBit
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC  [9] All

```

Figure 17-16. Expose - T1/E1 Link Status Submenu

Some of the fields are context sensitive, (e.g., the CRC errors only appear for links that support CRC such as T1 ESF, E1-CRC, or E1-CRC-CAS).

An error-free link will display zeroes in all fields.

Keys **[1]** through **[9]**: Use keys 1 through 9 to insert errors from the NI side, which should be detected at the remote side. If the remote side is line looped, the inserted errors should be returned and counted in the link status screen on the local side.

ESF Statistics

The ESF Statistics display is a read-only screen. It allows you to view both current and 24 hour ESF Statistics. The Current Statistics column displays the counts for the current time interval (maximum 15 minutes). The 24 Hour Statistics column displays the counts for the preceding 24-hour period.

Display ESF Statistics

To display ESF Statistics:

Place your cursor on any active link in the *Diagnostics Manager* submenu and press **S**. The following screen appears:

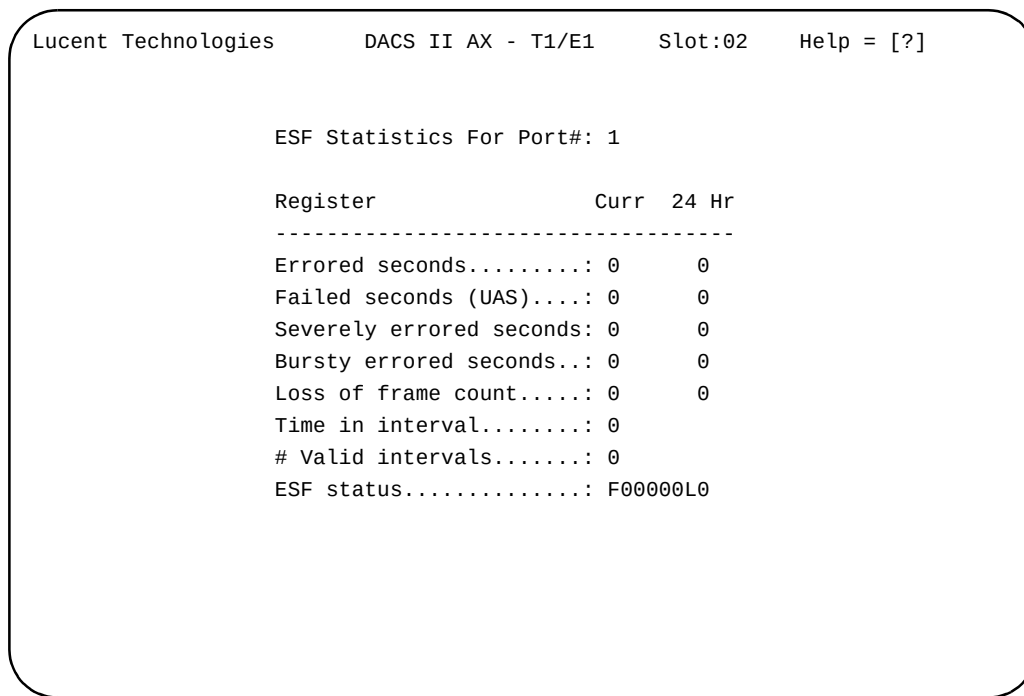


Figure 17-17. ESF Statistics Display

ESF Statistics Field Descriptions

These fields appear on the ESF Statistics menu (Figure 17-17).

Errored secs: The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field represents the number of errored seconds that have occurred.

Failed secs (UAS): Each second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field represents the number of failed seconds that have occurred.

Severely errored secs: A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field represents the number of severely errored seconds that have occurred.

Bursty errored secs: A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field represents the number of bursty errored seconds that have occurred.

Loss of frame count: A loss of frame occurs when either network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

Time in interval: A timer that tracks the number of seconds in one 15-minute interval.

of Valid intervals: A counter that tracks the total number of 15 minute intervals in a 24 hour period (up to 96).

ESF status: This field defines the status of the T1 line. The status is defined by an eight digit number that is described below:

FU0000LO

Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.

Digit #2 - "U" or "0" where "U" indicates an unavailable signal state.

Digit #3 through #6 and #8 are always "0."

Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.

ESF Registers

The *ESF Registers Display* is a read-only screen. It displays the same information as the *ESF Statistics Display*, but it is broken down by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

Display ESF Registers

To display the ESF Registers:

Place your cursor on any active link in the *Diagnostics Manager* submenu and press **R**. The following menu appears:

```

Lucent Technologies      DACS II AX - T1/E1      Slot:02      Help = [?]

                                ESF registers For Port#: 1
INT ES  FS  SES BES  INT ES  FS  SES BES  INT ES  FS  SES BES
-----
01. 000 000 000 000  17. 000 000 000 000  33. 000 000 000 000
02. 000 000 000 000  18. 000 000 000 000  34. 000 000 000 000
03. 000 000 000 000  19. 000 000 000 000  35. 000 000 000 000
04. 000 000 000 000  20. 000 000 000 000  36. 000 000 000 000
05. 000 000 000 000  21. 000 000 000 000  37. 000 000 000 000
06. 000 000 000 000  22. 000 000 000 000  38. 000 000 000 000
07. 000 000 000 000  23. 000 000 000 000  39. 000 000 000 000
08. 000 000 000 000  24. 000 000 000 000  40. 000 000 000 000
09. 000 000 000 000  25. 000 000 000 000  41. 000 000 000 000
10. 000 000 000 000  26. 000 000 000 000  42. 000 000 000 000
11. 000 000 000 000  27. 000 000 000 000  43. 000 000 000 000
12. 000 000 000 000  28. 000 000 000 000  44. 000 000 000 000
13. 000 000 000 000  29. 000 000 000 000  45. 000 000 000 000
14. 000 000 000 000  30. 000 000 000 000  46. 000 000 000 000
15. 000 000 000 000  31. 000 000 000 000  47. 000 000 000 000
16. 000 000 000 000  32. 000 000 000 000  48. 000 000 000 000

                                [N]ext Page
  
```

Figure 17-18. ESF Registers Display

2. Press **N** to view the next 48 intervals.

ESF Registers Field Descriptions

The following fields appear on the ESF Registers menu (Figure 17-18)

INT (Interval): The interval number for the ninety-six 15-minute intervals preceding the current interval, with 01 being the most recent.

ES (Errored Seconds): The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred since the last counter reset.

FS (Failed Seconds): Each one second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field displays the number of severely errored seconds that have occurred since the last counter reset.

SES (Severely Errored Seconds): A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.

BES (Bursty Errored Seconds): A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

G.826 Statistics

Display G.826 Statistics

To access the G.826 Statistics screen:

The *G.826 Statistics Display* is a read-only screen. It displays statistics reflecting the performance of the link for the duration of time the link is up and running.

Place your cursor on any *Active* link in the *Diagnostics Manager* submenu and press **G**. The following menu appears:

```
Lucent Technologies      DACS II AX - T1/E1      Slot:02      Help = [?]  
  
      G.826 Statistics  
      -----  
  
Link#: 1  
Total Time.....: 26  
Errored Seconds.....: 1  
Errored Free Seconds.....: 25  
Severely Errored Seconds.....: 0  
Consecutive Severely Errored Seconds: 0  
Consecutive Errored FreeSeconds.....: 25  
Background Errored Seconds.....: 0  
Errored Seconds Ratio.....: 0.0385  
Severely Errored Seconds Ratio.....: 0.0000  
Background Errored Seconds Ratio....: 0.0000  
  
[C]lear Counters
```

Figure 17-19. G.826 Statistics Display

3. The only action that can be accomplished on this screen is pressing **C** to clear the counters.

Descriptions for each field on this screen are supplied on the following pages.

G.826 Statistics Field Descriptions

The following fields appear on the G.826 Statistics display (Figure 17-19).

Refer to the ITU-T Standardized Specifications, dated 08/96, for a more detailed description of the G.826 statistics.

Total Time: Displays the amount of time (in seconds) that the link has been up and running.

Errored Seconds: A one-second period with one or more errored blocks or at least one defect is known as an errored second. This field displays the number of errored seconds that have occurred since the last counter reset.

Error Free Seconds: A one-second period of time during which the link was error-free. This field represents the number of error free seconds that have occurred.

Severely Errored Seconds: A subset of errored seconds, a one-second period in which more than 30% of the blocks contain errors is known as a severely errored second. This field displays the number of severely errored seconds that have occurred since the last counter reset.

Consecutive Severely Errored Seconds: A continuous occurrence of severely errored seconds, in one-second intervals, which contain >30% or more errored blocks. This field represents the number of consecutive severely errored seconds that have occurred since the last counter reset.

Consecutive Error Free Seconds: A display of consecutive one-second period intervals that did not have defects or errors on the link. This field displays the number of consecutive error free seconds that have occurred since the last counter reset.

Background Errored Seconds: A one second period with one or more errored blocks or at least one defect not occurring as part of the errored seconds. This field displays the number of background errored seconds that have occurred since the last counter reset.

Errored Seconds Ratio: Displays the ratio of errored seconds to total seconds in available time during a fixed measurement interval.

Severely Errored Seconds Ratio: Displays the ratio of severely errored seconds to total seconds in available time during a fixed measurement interval.

Background Errored Seconds Ratio: Displays the ratio of background block errors to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during severely errored seconds.

Reinitializing

The Reinitialize function is used to reset the framers to their default values. It will only reset the framers, not the entire module.

**NOTE:**

Re-initializing the framers will cause data to be momentarily corrupted.

Reinitialize the Framer

To re-initialize the Framer:

1. From the *T1/E1 Link Status* submenu, press I, and the framer re-initializes. The *T1/E1 Link Status* submenu continues to be displayed.
-

Inserting Errors

For diagnostic purposes, specific errors can be inserted and momentarily transmitted either directly to a remote unit or looped back to the Octal T1/E1 module.

Procedure

To insert Errors:

1. From the *T1/E1 Link Status* submenu, press the specific numeric key indicated on the bottom of the menu to insert a momentary error. The errors and their corresponding *hot keys* are as follows:
 - **[1]** CAS Multiframe
 - **[2]** Multiframe
 - **[3]** PRBS
 - **[4]** FBit
 - **[5]** Frame Alignment
 - **[6]** Line Code Violation
 - **[7]** Bit Slip
 - **[8]** CRC
 - **[9]** All
-

Monitor Control Signals

Procedure

To monitor Control Signals:

From the *Diagnostics Menu*, move your cursor to the *Monitor Control Signals* field and press **<Enter>**. The following menu appears:

Lucent Technologies

DACS II AX - T1/E1

Slot:01

Help = [?]

Link:01

PCM Signalling Display Menu

DS0	To Link	To Bus	DS0	To Link	To Bus
01	ABC_	ABCD	17	A_CD	ABCD
02	ABC_	ABCD	18	ABCD	ABCD
03	ABC_	ABCD	19	ABCD	ABCD
04	ABC_	ABCD	20	ABCD	ABCD
05	ABC_	ABCD	21	ABCD	ABCD
06	ABC_	ABCD	22	ABCD	ABCD
07	ABC_	ABCD	23	ABCD	ABCD
08	ABC_	ABCD	24	ABCD	ABCD
09	ABC_	ABCD	25	None	None
10	ABC_	ABCD	26	None	None
11	ABC_	ABCD	27	None	None
12	ABC_	ABCD	28	None	None
13	ABC_	ABCD	29	None	None
14	ABC_	ABCD	30	None	None
15	ABC_	ABCD	31	None	None
16	ABC_	ABCD	32	None	None

Figure 17-20. PCM Signalling Display Menu

2. This menu is read-only, the only operator action available is pressing **<Enter>** to view the status of a different link.

PCM Signalling Display Menu Field Descriptions

These fields appear on the PCM Signalling Display menu (Figure 17-20).

Link: Select the link for which to display control signals by pressing **<Enter>** to cycle through the choices.

DS0: Displays the DS0 (01-32) for which the control signals are being reported.

To Link: This field displays the control signals (*A*, *B*, *C*, or *D*) that are being sent towards the link.

To Bus: This field displays the control signals (*A*, *B*, *C*, or *D*) that are being sent towards the DACS II AX Backplane.

Utilities Menu

The Utilities Menu provides access to two submenus from which you can reset the Octal T1/E1 Module or set its status.

Access Utilities

To access the Utilities Menu:

From the *Main Menu*, place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

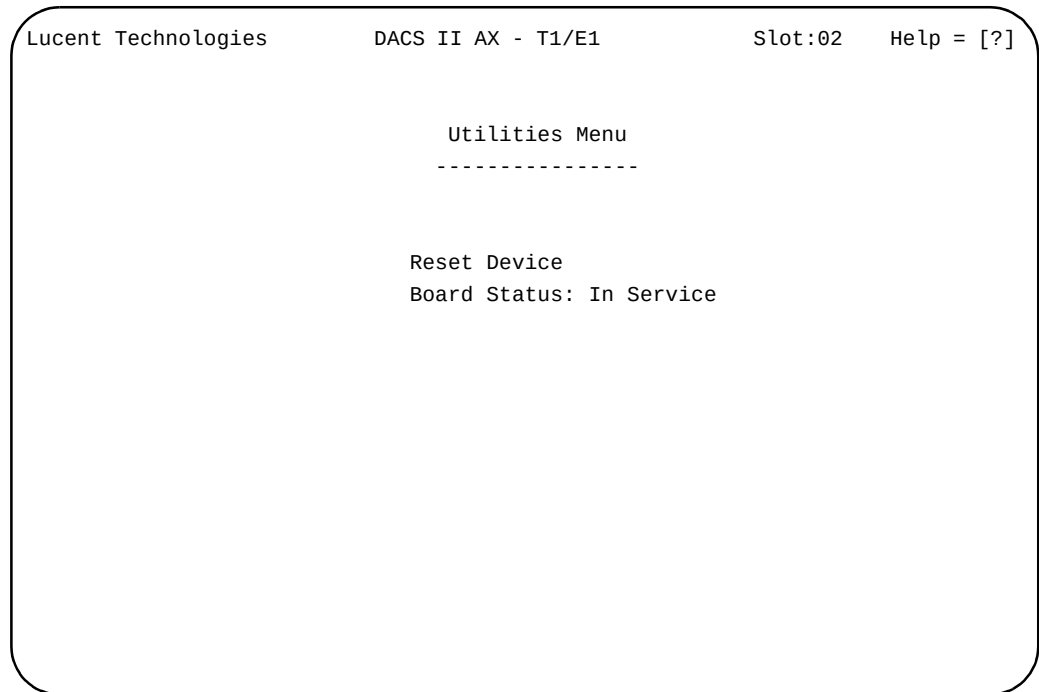


Figure 17-21. Utilities Menu

From the *Utilities Menu*, you can either reset the Octal T1/E1 Module or change its status to *In Service* or *Out of Service*.

Reset Octal T1/E1 Module

**WARNING:**

Resetting the module takes approximately 15 seconds, which will cause data to be momentarily corrupted.

To reset the Octal T1/E1 Module:

The Reset utility causes the Octal T1/E1 Module to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the System Manager Controller, connections will be restored.

From the *Utilities Menu*, place your cursor on the *Reset Device* field and press **<Enter>**. The following screen appears:

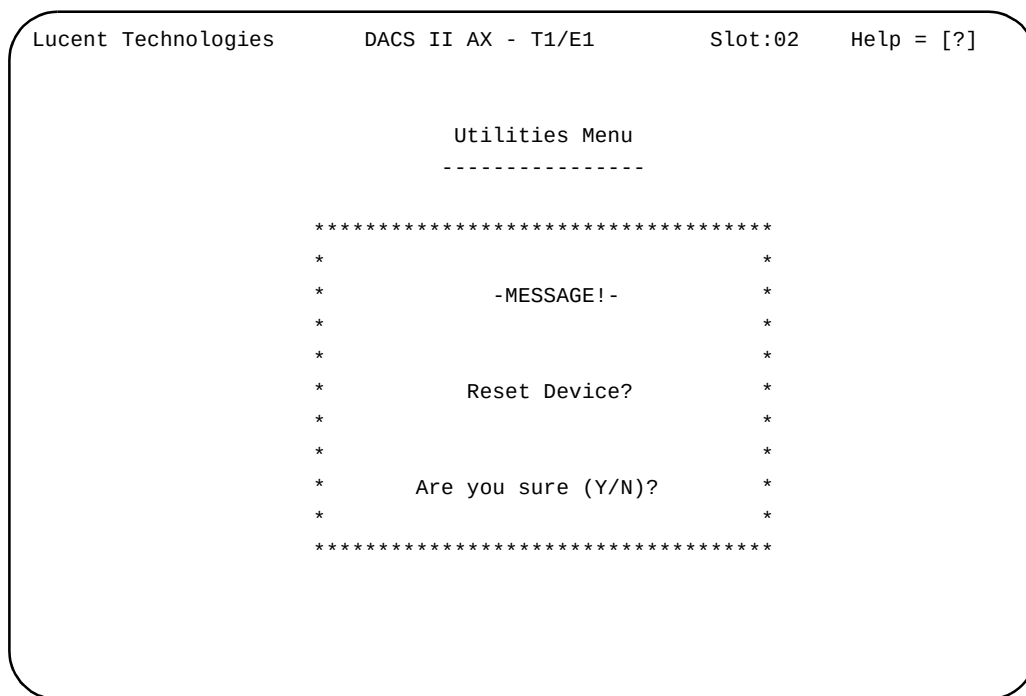


Figure 17-22. Reset Device Screen

3. Press **Y** to reset the board, and wait a approximately 15 seconds for the card to reset. The LEDs will cascade down the bezel, and you are returned to the *Node Summary Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, note that the Octal T1/E1 Module's state will cycle through a combination of "On-line," "Standby," "Out of Service," and finally "On-line." This is a normal occurrence when the device resets. Wait for the Device State on the menu to display "On-line" before you proceed.

**Put In-Service or
Out of Service**

To set the Board Status:

The Board Status field allows the administrator to put the Octal T1/E1 Module in service or out of service.

1. From the *Utilities Menu*, place your cursor on the *Device Service* field and press **<Enter>**.

If the board status was *In Service*, the following screen appears:

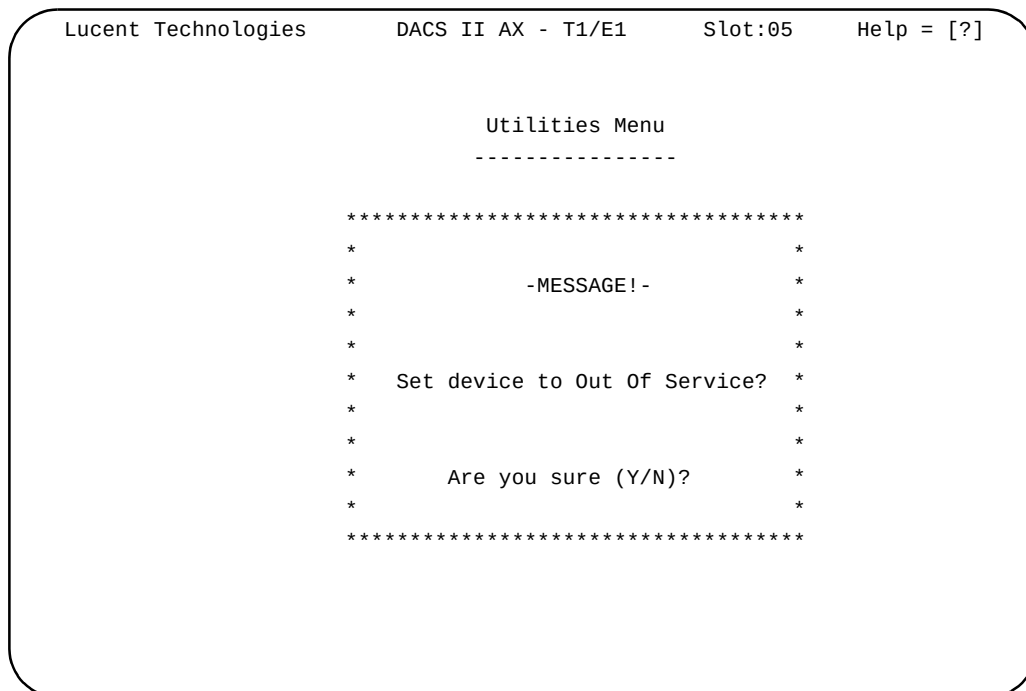


Figure 17-23. Board Status Out Of Service Screen

2. Press **Y** to change the board status to *Out Of Service*, or press **N** to return to the *Utilities Menu*.
3. If **Y** is selected, the board status will read *Out Of Service* in the *Utilities Menu*. All the LEDs will blink yellow.

If the board status was *Out of Service*, the following screen appears:

```

Lucent Technologies      DACS II AX - T1/E1      Slot:05      Help = [?]

                          Utilities Menu
                          -----

*****
*                                                                *
*                                                                *
*                      -MESSAGE!-                               *
*                                                                *
*                                                                *
* Set device to In Service?  **Device Will Reset**            *
*                                                                *
*                                                                *
*                      Are you sure (Y/N)?                      *
*                                                                *
*****

```

Figure 17-24. Reset In Service Screen

4. Press **Y** to change the board status to *In Service*, or press **N** to return to the *Utilities Menu*.
5. If **Y** is selected, it will take approximately 10-20 seconds for the card to change to *In Service*. The LEDs will cascade down the bezel, and you are returned to the Node Summary Menu.



NOTE:

Once you have been returned to the Node Summary Menu, note that the Octal T1/E1 Module's state will cycle through a combination of "On-line," "Standby," "Out of Service," and finally "On-line." This is a normal occurrence when the device resets. Wait for the Device State on the menu to display "On-line" before you proceed.

N+1 Redundancy Menu

The N+1 Redundancy Menu provides a means to check N+1 Redundancy Status. It is applicable to DACS II AX-11 units equipped with the N+1 Protection Switch.

Display Redundancy Information

To display N+1 Redundancy Information:

From the *Main Menu*, move your cursor to the *N+1 Redundancy* field and press **<Enter>**. The following menu appears:

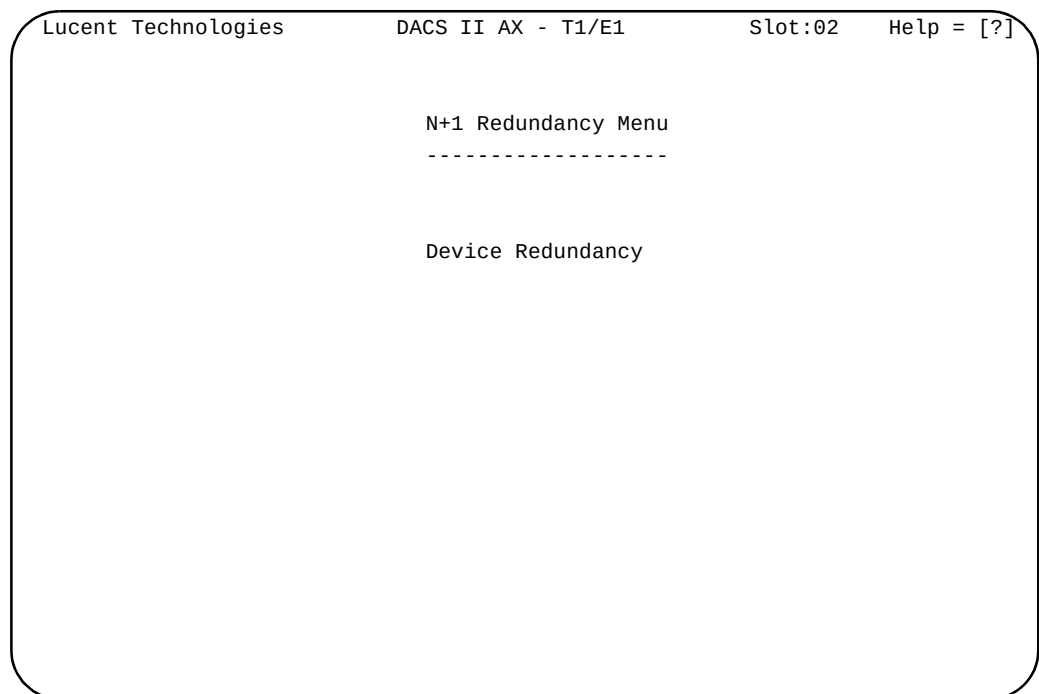


Figure 17-25. Octal T1/E1 Module N+1 Redundancy Menu

Then place your cursor on the *Device Redundancy* field and press **<Enter>**. The following display appears:

```
Lucent Technologies          DACS II AX - T1/E1          Slot:02    Help = [?]  
  
                          N+1 Redundancy Status Menu  
  
Redundancy...: Disabled  
Card Type...: Primary  
Device State: Online  
  
                          State      Change Count  
                          -----  
Frame Sync Pulse.....: OK          0  
System Clock.....: OK          0  
Backplane Timeslot Management: OK    0  
Communication with System Mgr: OK    0  
Rear Card.....: OK          0  
Framers.....: OK          0  
  
[C]lear counters
```

Figure 17-26. N+1 Redundancy Status Menu

The *N+1 Redundancy Status* menu is a read-only screen. The only action that can be accomplished here is pressing **C** to clear the counters. Descriptions for each field on this screen are supplied on the following page.

N+1 Redundancy Status Field Descriptions

These fields appear on the N + 1 Redundancy Status menu (Figure 17-26).

Redundancy: *Enabled* means that the Octal T1/E1 Module is a member of an N+1 Redundancy Group, while *Disabled* means that it is not a member of an N+1 Redundancy Group.

Card Type: Displays whether the Octal T1/E1 Module is configured as *Primary* or *Secondary*.

Device State: Displays the current state of the Octal T1/E1 Module as either *On-line*, *Off-line*, *Standby*, *Defective*, or *Bus Error*.

State: Displays the status of the following:

- **Frame Sync Pulse:** If the state is Missing, it indicates a loss of synchronization error.
- **System Clock:** If the state is Missing, it indicates a loss of system clock.
- **Backplane Timeslot Management:** If the state is Invalid, it indicates that the backplane is flooded with more timeslots than the card can handle.
- **Communication with System Mgr:** If the state is Lost, it indicates that the device has not received any messages from the System Manager Controller (SMC II) for more than one minute.



NOTE:

If the state reads "Lost", you most likely have problems with your Octal T1/E1 Module, not the SMC II.

- **Rear Card:** If the state is Missing, it indicates the rear card is not being detected. The device will reset after the rear card is detected again.
- **Framers:** If the state is Bad, it indicates either one of the framers is bad (hardware failure).

Change Count: Displays the number of state changes since the last time the counters were cleared.

About Menu

The About Menu displays version, release date, and checksum information for the Octal T1/E1 Module software, and version information for the Octal T1/E1 Module hardware.

Display Module Information

To display Module Identification Information:

From the *Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following display appears:

```
Lucent Technologies      DACS II AX - T1/E1      Slot:01      Help = [?]  
  
                          About  
                          -----  
  
Version.....: 02.02  
Release Date.....: April 17, 2000  
Checksum.....: 1F85  
Xilinx Version....: wb_xlx14  
Front Card Type...: Octal T1/E1  
Front Card Rev....: 0  
Rear Card Type....: Octal T1E1 120 OHM  
Rear Card Rev.....: 1
```

Figure 17-27. About Display

The *About* display is a read-only screen. Descriptions for each field on this screen are supplied on the following page.

About Field Descriptions

The following fields appear on the Octal T1/E1 module About menu (Figure 17-27).

Version: Displays the software version currently residing in the Octal T1/E1 Module's flash memory.

Release Date: Displays the date of module software release.

Checksum: Displays the sum of all bytes in the Octal T1/E1 Module's flash memory at power up. Also used to identify software version.

XILINX Version: Displays the hardware version of downloadable, programmable devices.

Front Card Type: Displays the type of Application Module in the system.

Front Card Rev: Displays the Application Module's hardware revision level.

Rear Card Type: Displays the type of Interface Module in the system.

Rear Card Rev: Displays the Interface Module's hardware revision level.

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Physical Description

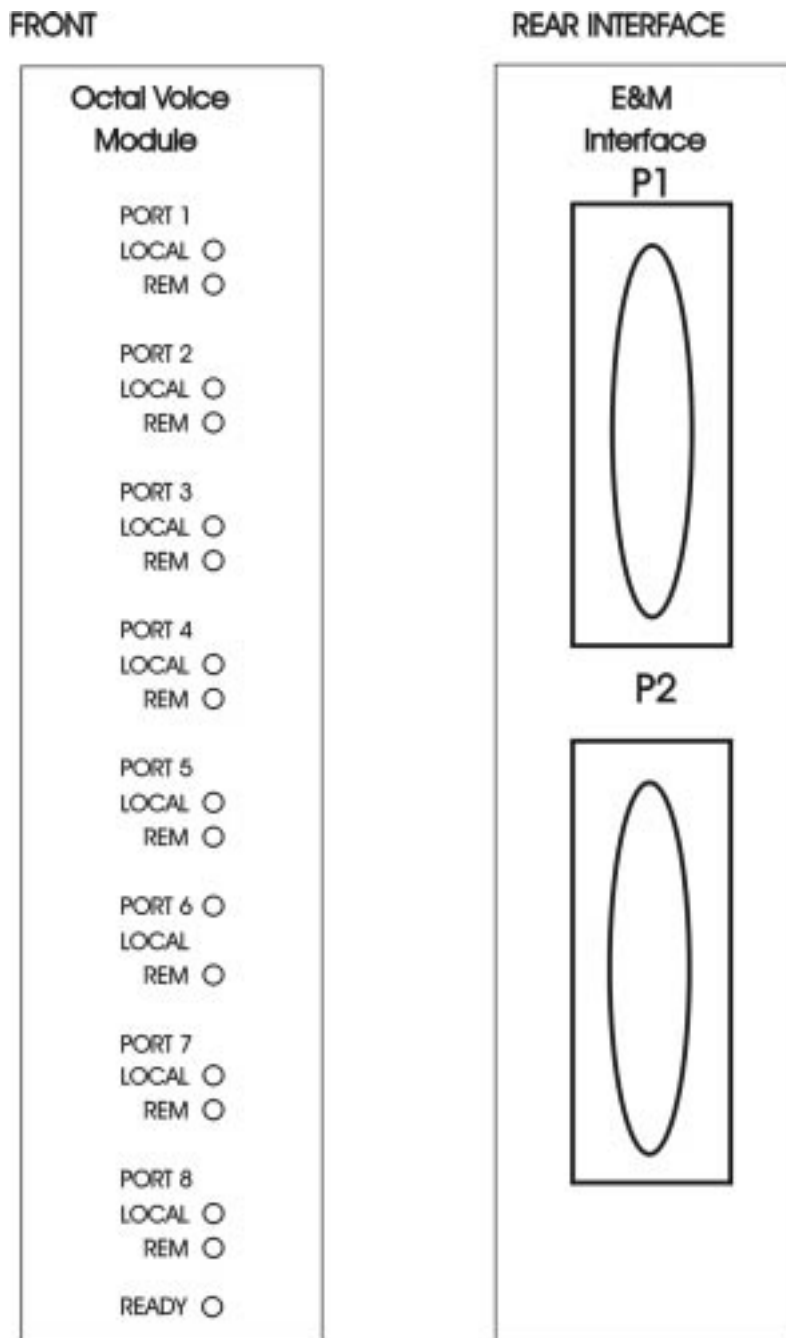


Figure 18-1. Octal Voice Application/Interface Module Set

Rear Interface

Three rear card interface modules are available for use with the Octal Voice Module. A -48V must be supplied to the DACS II AX chassis for any voice application to function. The rear card type is detected at system power up. The user can configure the rear card to E&M, FXO or FXS.

The default configuration for the rear card is FXO. The only instance a user can configure the rear card type setting is if the configured rear card type is different than the actual rear card type detected. The DACS II AX system will reset if the rear card is valid. The system will go offline if the configured rear card type is different from the actual rear card type detected.

- **Octal 4 Wire E&M** - provides eight 4 wire interfaces via two 50-pin Telco type connectors. Leads supported include Tip, Ring, Tip1, Ring1, E, M, SB, and SG. Applications include 2/4 Wire to analog data applications, and 2/4 Wire E&M voice trunks.
- **Octal 2 Wire FXO/DPT** - provides eight Foreign Exchange Office (FXO) or Dial Pulse Termination (DPT) voice interfaces via a 50-pin Telco type connector. The Octal 2W/FXO/DPT can sink and detect ringing or sink and detect forward or reverse battery current dependent on configuration. The 2W/FXO/DPT can be employed to extend dial tone to a remote PBX or for support of Direct Inward Dialing (DID).
- **Octal 2 Wire FXS** - provides eight Foreign Exchange Station (FXS) voice interfaces via a 50-pin Telco type connector. The Octal 2W/FXS supports distinctive ringing, and can utilize loop start, private line auto ring (PLAR) or ground start connections to conventional analog telephone devices. Ring generation is integral to the 2W/FXS.

Table 18-1. FXO/FXS Pinouts - P1 Connector

Channel								
Signal	1	2	3	4	5	6	7	
Ring	26	29	32	35	38	41	44	47
Tip	1	4	7	10	13	16	19	22

LED Display

Octal Voice Front Card: There are eight sets of LEDs, one set for each port, and a READY LED.

- **LOC** - green LED indicates hook status received from the backplane.
- **REM** - green LED indicates hook status received from the trunk.
- **READY** - green LED indicates status of module.

During initialization, Port 1's LOC(ation) and REM(ote) LEDs toggle ON and OFF to indicate Xilinx load in progress. Once the files are loaded, LOC and REM LEDs turn OFF. If an Off-hook condition is detected, the LEDs will turn on.

The LOC and REM LEDs of all 8 ports flash to indicate system software download is in progress.

If there is only one SMC card in the system, and it is removed and then plugged back in, all of the cards will reset.

The READY LED indicates the voice card status; it will flash if there is a missing or invalid rear card in the system.

If the system is off-line or Off the Buss, the READY LED flashes.

**Off-line
Conditions**

The system is off-line when the following conditions occur:

- Card Out of Service (All LEDs flash)
- No Connection Map received
- Invalid Rear Card present
- SMC Clock Failure
- Missing Frame SYNC signal
- too many Time Slots Active
- Hardware write to Backplane Memory inhibited

**NOTE:**

The N + 1 Protection Switch does not supply redundancy for the Octal Voice module set.

Before You Begin

- This chapter is for ADMINISTRATOR-level users.
 - In order to view the menus associated with the Octal Voice module, a slot must first be configured for the module type and the Octal Voice card must be in a slot in the equipment chassis.
-

Slot Configuration

Procedure - Configure Slot

To configure a slot for the Octal Voice Card:

1. From the DACS II AX Main Menu, scroll down to the *System Configuration* field and press **<Enter>**.
2. Press **<Enter>** at the *Slot Configuration* field. The Slot Configuration menu appears.
3. Place your cursor on the desired slot #, where your Octal Voice module will reside, and press **<Enter>**. The Slot Configuration submenu appears.
4. At the Slot Configuration submenu, place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number and press **<Enter>** again.
5. Next, press the down arrow key to the *Card Type* field and scroll through the card types by pressing the **<Enter>** key.
6. Select the Octal Voice card type.
7. Press **X** to save your configuration and return to the previous menu.

**NOTE:**

The same procedure applies when replacing an existing card in a slot.

Delete Slot Configuration

To delete a card, press **D** and a message appears stating, "All existing connections for this slot will be deleted." Press Y(es) to confirm the action or N(o) to discontinue.

Octal Voice Main Menu

The Octal Voice Main Menu is accessed from the Node Summary. The Node Summary Menu must display Octal Voice for *Configured Type*, and the *Device State* must display Online or Standby in order to access the Octal Voice Module Main Menu. If the *Device State* is Offline, an alert message is generated.

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
Databases: InSync           N+1 Redundancy State: Disabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#  Configured Type  Device State  Alarm
-----
01     + Octal T1/E1    Standby      None
02     Octal High Speed Online        None
03     + Octal T1/E1    Online       None    Clock Src
04     + Octal T1/E1    Online       None
05     + Octal T1/E1    Online       None
06     + Octal T1/E1    Online       None
07     + Octal T1/E1    Online       None
08     + Octal T1/E1    Online       None
09     Octal Voice      Online       None
11     + T3             Online       None
11     + T3             Standby     None
SMCA   System Manager A Standby     None
SMCB   System Manager B Online      None
PSX    ProtectionSwitch Not present  None

[C]lear error counts  [S]lot Cfg    [E]xpose  [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver  [R]estore

```

Figure 18-2. Node Summary Menu

To go to the Octal Voice Main Menu, move the cursor to a slot that contains an Octal Voice Module and press **<Enter>**.

From the Octal Voice Main Menu you can configure the module, run diagnostics, access utilities, and display module identification (software revision levels).

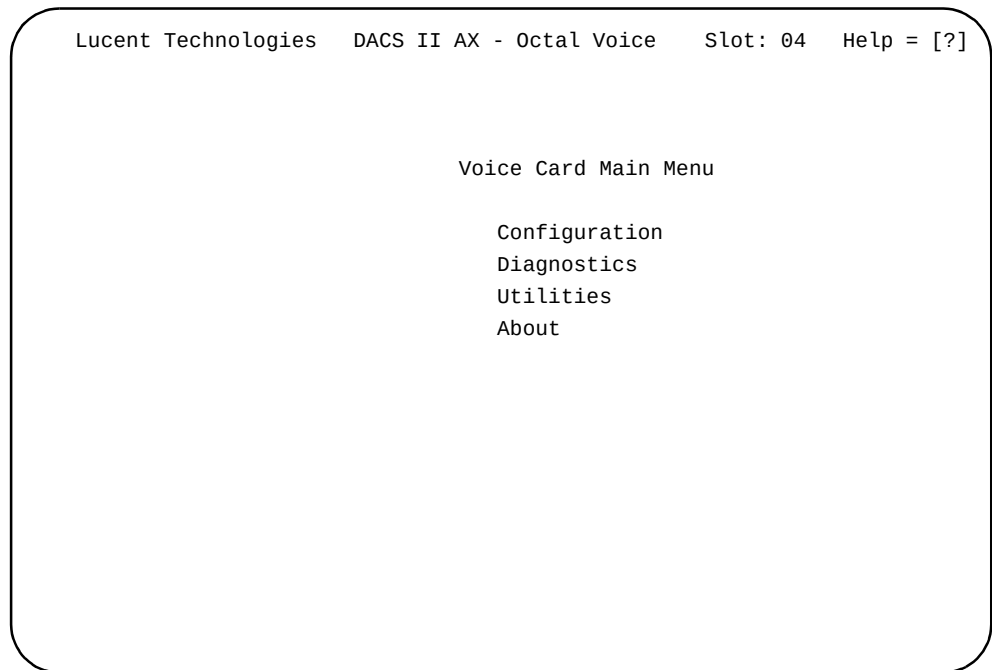


Figure 18-3. Octal Voice Card Main Menu

Configuration

The Configuration menu allows the user to change the voice card settings to suit their application needs. Once the card is set up, its configuration should be saved in order to allow the system to restore the settings when the system resets.

When a rear card is first plugged into the DACS II AX, the Octal board resets and an ****Invalid Rear Card**** message appears on the screen of the Voice Card Main Menu (see next screen). All menus are inaccessible until reset is complete. This takes approximately 45 seconds.

Configure the E&M Rear Card

To configure the E&M rear card:

1. Place your cursor on the *Configuration* field and press **<Enter>**. The Voice Card Configuration Menu appears:

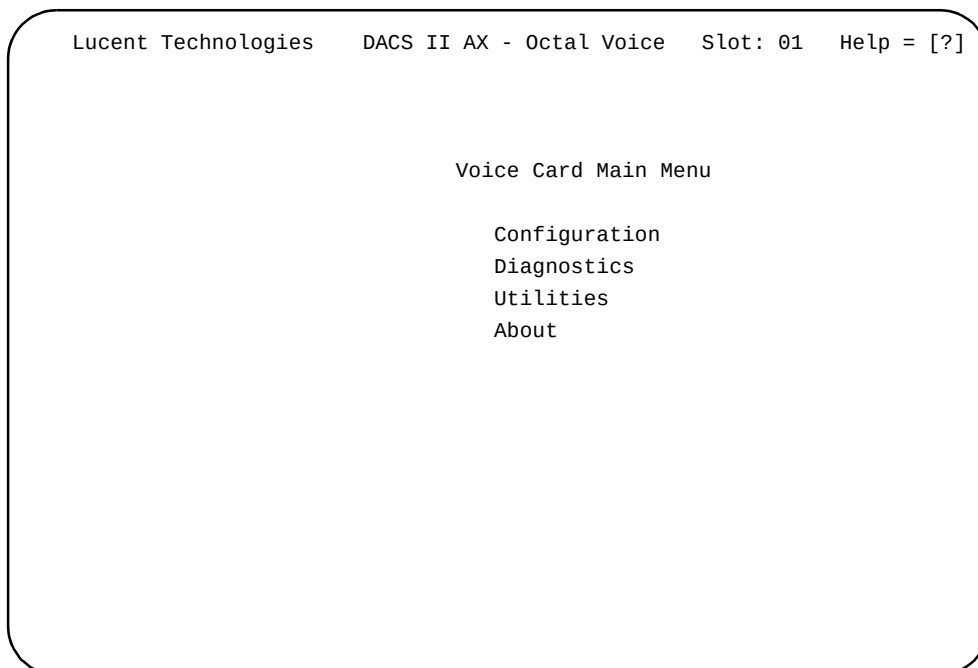


Figure 18-4. Voice Card Main Menu

Lucent Technologies DACS II AX - Octal Voice Slot: 03 Help = [?]						
Octal Voice Card Configuration						
Port#	Name	Port Status	Port Type	Codec Mode	Rx Gain	Tx Gain
01	Port01	In Service	Loop Start	mu-Law	0 dB	0 dB
02	Port02	Out of Service	Loop Start	mu-Law	0 dB	0 dB
03	Port03	Out of Service	Loop Start	mu-Law	0 dB	0 dB
04	Port04	Out of Service	Loop Start	mu-Law	0 dB	0 dB
05	Port05	Out of Service	Loop Start	mu-Law	0 dB	0 dB
06	Port06	Out of Service	Loop Start	mu-Law	0 dB	0 dB
07	Port07	Out of Service	Loop Start	mu-Law	0 dB	0 dB
08	Port08	Out of Service	Loop Start	mu-Law	0 dB	0 dB
Configured Rear Card Type: Octal Voice FXS/PLAR Operation Mode.: PCM 64Kbps						
Actual Rear Card Type.....: Octal Voice FXS/PLAR Backplane Status: On the Bus						

Figure 18-5. Voice Card Configuration Menu

- On the Voice Card Configuration menu, go to the *Configured Rear Card Type* field near the bottom of the screen and press **<Enter>**.
- Press **<Enter>** again, to scroll through the available options, which are:
 - E&M (selected)
 - FXO
 - FXS
- Type **X** to save your selection. A screen message appears: "Alert Please wait while the card prepares to reset! Press any key to continue".
- Upon pressing any key, the system returns to the Node Summary Menu. Place your cursor on Octal Voice and press **<Enter>**.

**NOTE:**

The Octal Voice configuration files are stored on the System Manager Card. When an Octal Voice card is replaced, the old configuration is preserved.

**Configure the
E&M Parameters**

To configure the E&M parameters:

1. From the Voice Card Main Menu, select Configuration. Place your cursor on the *Configuration* field and press **<Enter>**. The following screen appears:

```

Lucent Technologies   DACS II AX - Octal Voice   Slot: 04   Help = [?]

                                Octal Voice Card Configuration

Port#  Name      Port Status  Type      Mode      Codec Mode  Rx Gain Tx Gain
-----
01     Port01    In Service  E&M II    Switching  mu-Law      0 dB   0 dB
02     Port02    In Service  E&M II    Switching  mu-Law      0 dB   0 dB
03     Port03    In Service  E&M II    Signaling  mu-Law      0 dB   0 dB
04     Port04    In Service  E&M II    Signaling  mu-Law      0 dB   0 dB
05     Port05    In Service  E&M II    Signaling  mu-Law      0 dB   0 dB
06     Port06    In Service  E&M II    Signaling  mu-Law      0 dB   0 dB
07     Port07    In Service  E&M II    Signaling  mu-Law      0 dB   0 dB
08     Port08    In Service  E&M II    Signaling  mu-Law      0 dB   0 dB

Configured Rear Card Type: Octal Voice E&M   Operation Mode...: PCM 64Kbps
Actual Rear Card Type....: Octal Voice E&M   Backplane Status: On the Bus
  
```

Figure 18-6. E&M Configuration Screen

2. Place your cursor on the port you want to configure and press **<Enter>**.
The following submenu appears:

Lucent Technologies DACS II AX - Octal Voice Slot: 04 Help = [?]

Octal Voice Card Configuration

-

Port# Selected....: 1

Name.....: Port01

Port Status.....: In Service

Codec Mode.....: mu-Law

Rx Gain.....: 0 dB

Tx Gain.....: 0 dB

Use Default Settings = [D]

Figure 18-7. E&M Port Configuration Submenu

3. Configure the E&M port.
 4. Press **X** to return to the previous menu.
-

E&M Configuration Field Descriptions

These fields appear on the E&M Port Configuration submenu (Figure 18-7).

Port #: The port to be configured.

Name: (text field) This is a user-defined field. Any name up to 11 characters in length can be entered to identify each port on the Octal Voice. Some users find it beneficial to use circuit numbers to name the ports.

Port Status: (option field) This field determines the status of the port. The status will either be *In Service* or *Out Of Service*.

Port Type: (option field) Depending upon the rear card type, the following port types are available under E&M:

- **E&M Rear Card** - the trunk type and trunk mode settings for the ports are selected by setting the appropriate jumper blocks in the rear card; it is not soft-configurable. There are four possible settings:
 - Type I, signaling mode
 - Type II, signaling mode

The default setting is Type I in signalling mode.



WARNING:

Care should be taken when removing or installing jumpers.

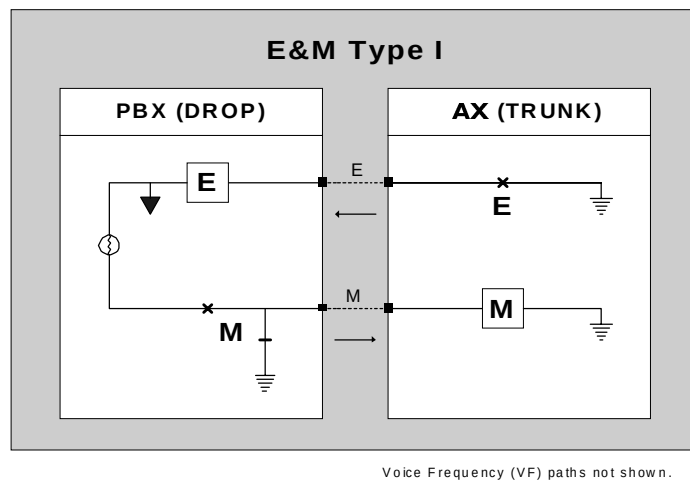


Figure 18-8. E&M - Type I Signaling

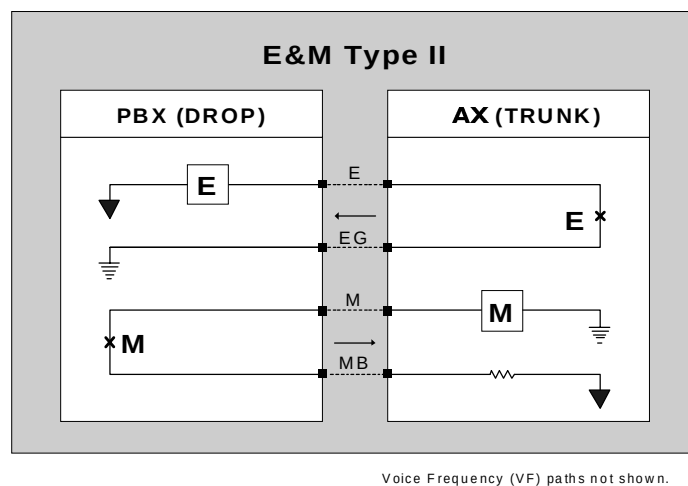


Figure 18-9. E&M - Type II Signaling

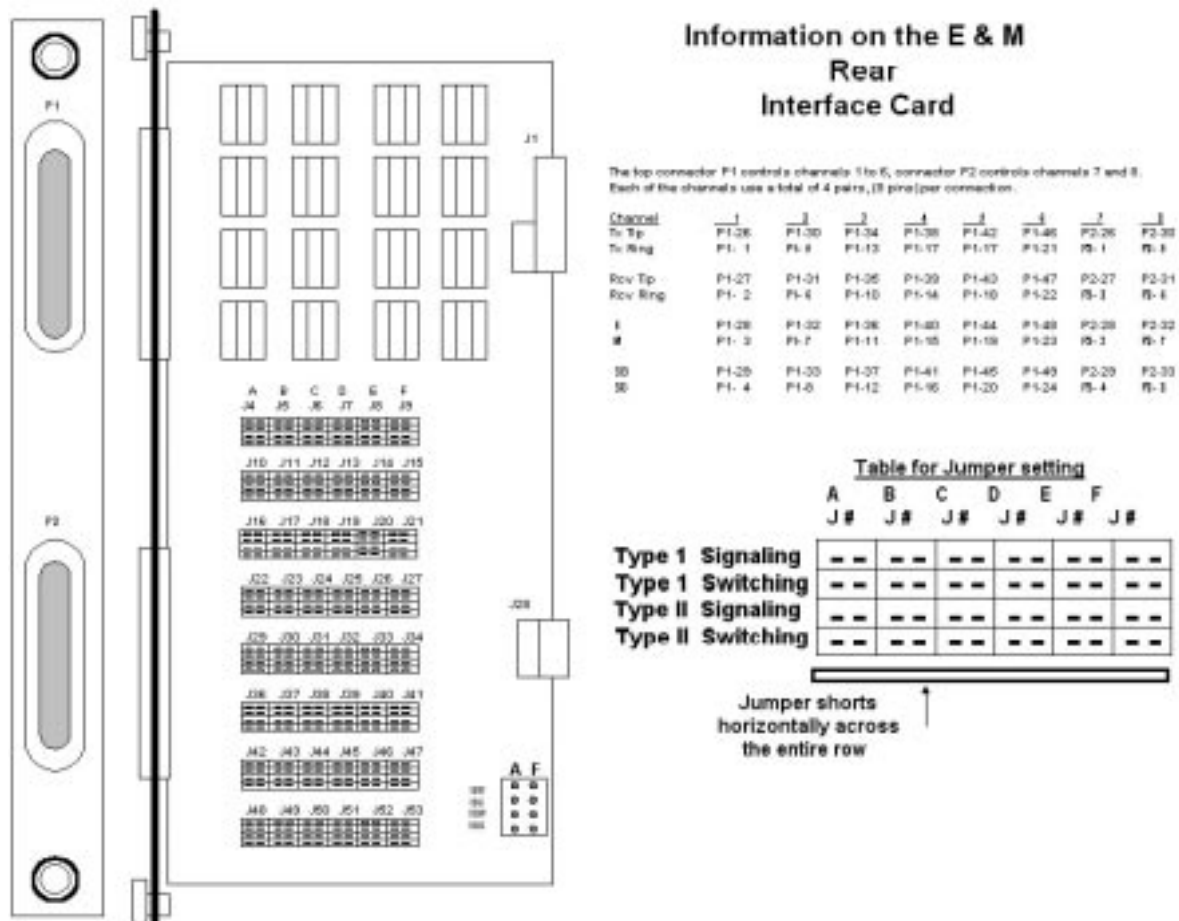


Figure 18-10. Jumper Settings for E&M Interface Card

Codec Mode: (option field) a coding algorithm. Select mu-law (default) for North American and Japan; A-Law for the rest of the world.

Rx Gain: (option field) adjusts the PCM receive signal gain from -6dB to +8dB.

Tx Gain: (option field) adjusts the PCM transmit signal gain from -6dB to +8dB.

Use Default Settings = [D] : (option field) press D to return your selections to the default settings.

Configured Rear Card Type and Actual Rear Card Type: Select and configure the rear card type to E&M, FXO, or FXS. If the configured type is different from the actual rear card type detected by the system, then only change the rear card type setting.



NOTE:

If the configuration file is not present, the default setting for the rear card is FXO.

Operation Mode: The operation mode is PCM, 64Kbps.

Backplane Status: A status that enables the card to communicate with the DACS II AX Backplane.

**Configure the FXO
Rear Card**

To configure the FXO rear card:

1. Physically remove the current rear card (the E&M interface card) from the DACS II AX chassis and replace it with another (in this case, the FXO interface card).
2. At the Node Summary Menu, place your cursor on Octal Voice and press **<Enter>**. The Voice Card Main Menu appears.
3. Place your cursor on the *Configuration* field and press **<Enter>**.

```

Lucent Technologies   DACS II AX - Octal Voice   Slot: 01   Help = [?]

      Octal Voice Card Configuration

Port# Name      Port Status      Port Type      Codec Mode      Rx Gain      Tx Gain
-----
01   Port01     In Service     Loop Start     mu-Law         0 dB         0 dB
02   Port02     In Service     Loop Start     mu-Law         0 dB         0 dB
03   Port03     In Service     Loop Start     mu-Law         0 dB         0 dB
04   Port04     In Service     Loop Start     mu-Law         0 dB         0 dB
05   Port05     In Service     Loop Start     mu-Law         0 dB         0 dB
06   Port06     In Service     Loop Start     mu-Law         0 dB         0 dB
07   Port07     In Service     Loop Start     mu-Law         0 dB         0 dB
08   Port08     In Service     Loop Start     mu-Law         0 dB         0 dB

Configured Rear Card Type:Octal Voice FX0/DPT Operation Mode: PCM64Kbps
Actual Rear Card Type....:Octal Voice FX0/DPT Backplane Status: On the Bus

```

Figure 18-11. Voice Card Configuration Menu

4. At the *Configured Rear Card Type* field press **<Enter>**.
5. Press **<Enter>** again, to scroll through the available options, which are:
 - E&M
 - FXO (selected)
 - FXS
6. Type **X** to save your selection. A screen message appears: "MESSAGE! Rear Card Type changed, RESET the card? Are you sure? (Y/N)?" Upon selecting **Yes**, another message appears: "ALERT! Please wait while the card prepares to reset! Press any key to continue".
7. Upon pressing any key, the system returns to the Node Summary Menu. Place your cursor on Octal Voice and press **<Enter>**.

**NOTE:**

The Octal Voice configuration files are stored on the System Manager Card. When an Octal Voice card is replaced, the old configuration is preserved.

**Configuring the
FXO Parameters**

To configure the FXO parameters:

1. From the Voice Card Main Menu, select Configuration. Place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

Lucent Technologies

DACS II AX - Octal Voice

Slot: 04

Help = [?]

Octal Voice Card Configuration

Port#	Name	Port Status	Port Type	Codec Mode	Rx Gain	Tx Gain
01	Port01	In Service	Loop Start	mu-Law	0 dB	0 dB
02	Port02	Out of Service	Loop Start	mu-Law	0 dB	0 dB
03	Port03	Out of Service	Loop Start	mu-Law	0 dB	0 dB
04	Port04	Out of Service	Loop Start	mu-Law	0 dB	0 dB
05	Port05	Out of Service	Loop Start	mu-Law	0 dB	0 dB
06	Port06	Out of Service	Loop Start	mu-Law	0 dB	0 dB
07	Port07	Out of Service	Loop Start	mu-Law	0 dB	0 dB
08	Port08	Out of Service	Loop Start	mu-Law	0 dB	0 dB

Configured Rear Card Type:Octal Voice FXO/DPT Operation Mode...:PCM64Kbps

Actual Rear Card Type...:Octal Voice FXO/DPT Backplane Status:On the Bus

Figure 18-12. FXO Configuration Menu

2. Place your cursor on the port you want to configure and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Octal Voice Slot: 04 Help = [?]

Octal Voice Card Configuration

Port# Selected.....: 1
Name.....: Port01
Port Status.....: In Service
Port Type.....: Loop Start
Codec Mode.....: mu-Law
Rx Gain.....: 0 dB
Tx Gain.....: 0 dB

Use Default Settings = [D]

Figure 18-13. FXO Configuration Submenu

FXO Configuration Field Descriptions

The following fields appear on the FXO Configuration submenu (Figure 18-13).

Port #: The port to be configured.

Name: (text field) This is a user-defined field. Any name up to 14 characters in length can be entered to identify each port on the Octal Voice. Some users find it beneficial to use circuit numbers to name the ports.

Port Status: (option field) This field determines the status of the port. The status will either be *In Service* or *Out Of Service*.

Port Type: (option field) Depending upon the rear card type, the following port types are available under FXO:

FXO Rear Card - the port type setting should be under the software control. Select from Loop Start and Ground Start type port configurations. The default port type setting should be Loop Start.

Codec Mode: (option field) a coding algorithm. Select mu-law (default) for North American and Japan; A-Law for the rest of the world.

Rx Gain: (option field) adjusts the PCM receive signal gain from -6dB to +8dB.

Tx Gain: (option field) adjusts the PCM transmit signal gain from -6dB to +8dB.

Use Default Settings = [D] : (option field) press D to return your selections to the default settings.

Configured Rear Card Type and Actual Rear Card Type: Select and configure the rear card type to E&M, FXO, or FXS. If the configured type is different from the actual rear card type detected by the system, then *only* change the rear card type setting.



NOTE:

If the configuration file is not present, the default setting for the rear card is FXO.

Operation Mode: The operation mode is PCM, 64 Kbps.

Backplane Status: A status that enables the card to communicate with the DACS II AX Backplane.

Configure the FXS Rear Card

To configure the FXS rear card:

1. Physically remove the current rear card (in this case, the FXO interface card) from the DACS II AX/DACS II AX chassis and replace it with another (in this case, the FXS interface card).
2. At the Node Summary Menu, place your cursor on Octal Voice and press **<Enter>**. The Voice Card Main Menu appears.
3. Place your cursor on the *Configuration* field and press **<Enter>**.

Lucent Technologies

DACS II AX - Octal Voice

Slot: 01

Help = [?]

Octal Voice Card Configuration

Port#	Name	Port Status	Port Type	Codec Mode	Rx Gain	Tx Gain
01	Port01	In Service	Loop Start	mu-Law	0 dB	0 dB
02	Port02	In Service	Loop Start	mu-Law	0 dB	0 dB
03	Port03	In Service	Loop Start	mu-Law	0 dB	0 dB
04	Port04	In Service	Loop Start	mu-Law	0 dB	0 dB
05	Port05	In Service	Loop Start	mu-Law	0 dB	0 dB
06	Port06	In Service	Loop Start	mu-Law	0 dB	0 dB
07	Port07	In Service	Loop Start	mu-Law	0 dB	0 dB
08	Port08	In Service	Loop Start	mu-Law	0 dB	0 dB

Configured Rear Card Type:Octal Voice FXS/PLAR Operation Mode:PCM64Kbps

Actual Rear Card Type....:Octal Voice FXS/PLAR Backplane Status:On the Bus

Figure 18-14. Voice Card Configuration Menu

4. At the *Configured Rear Card Type* field press **<Enter>**.
5. Press **<Enter>** again, to scroll through the available options, which are:
 - E&M
 - FXO
 - FXS (selected)
6. Type **X** to save your selection. A screen message appears: "MESSAGE! Rear Card Type changed, RESET the card? Are you sure? (Y/N)?" Upon selecting **Yes**, another message appears: "ALERT! Please wait while the card prepares to reset! Press any key to continue".
7. Upon pressing any key, the system returns to the Node Summary Menu. Place your cursor on Octal Voice and press **<Enter>**.

**NOTE:**

The Octal Voice configuration files are stored on the System Manager Card. When an Octal Voice card is replaced, the old configuration is preserved.

Configure the FXS Parameters

To configure the FXS parameters:

1. From the Voice Card Main Menu, select Configuration. Place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies      DACS II AX - Octal Voice      Slot: 04      Help = [?]

      Octal Voice Card Configuration

Port# Name      Port Status      Port Type      Codec Mode      Rx Gain      Tx Gain
-----
01      Port01      In Service      Loop Start      mu-Law      0 dB      0 dB
02      Port02      Out of Service      Loop Start      mu-Law      0 dB      0 dB
03      Port03      Out of Service      Loop Start      mu-Law      0 dB      0 dB
04      Port04      Out of Service      Loop Start      mu-Law      0 dB      0 dB
05      Port05      Out of Service      Loop Start      mu-Law      0 dB      0 dB
06      Port06      Out of Service      Loop Start      mu-Law      0 dB      0 dB
07      Port07      Out of Service      Loop Start      mu-Law      0 dB      0 dB
08      Port08      Out of Service      Loop Start      mu-Law      0 dB      0 dB

Configured Rear Card Type:Octal Voice FXS/PLAR Operation Mode:PCM 64Kbps
Actual Rear Card Type:Octal Voice FXS/PLAR Backplane Status: On the Bus

```

Figure 18-15. FXS Configuration Menu

2. Place your cursor on the port you want to configure and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Octal Voice Slot: 04 Help = [?]

Octal Voice Card Configuration

-

Port# Selected.....: 1

Name.....: Port01

Port Status.....: In Service

Port Type.....: PLAR

Codec Mode.....: mu-Law

Rx Gain.....: 0 dB

Tx Gain.....: 0 dB

Use Default Settings = [D]

Figure 18-16. FXS Configuration Submenu

FXS Configuration Field Descriptions

The following fields appear on the FXS Configuration submenu (Figure 18-16).

Port #: The port to be configured.

Name: (text field) This is a user-defined field. Any name up to 11 characters in length can be entered to identify each port on the Octal Voice. Some users find it beneficial to use circuit numbers to name the ports.

Port Status: (option field) This field determines the status of the port. The status will either be *In Service* or *Out Of Service*.

Port Type: (option field) Depending upon the rear card type, the following port types are available under FXS:

- **FXS Rear Card** - the port type setting should be under the software control. Select from Loop Start, Ground Start, and PLAR type port configurations. The default port type setting should be the Loop Start. If the Rear Card Type is changed from FXS to FXO, all Port Types configured as PLAR should be changed to Loop Start considering FXO does not have a corresponding third port type selection.

Codec Mode: (option field) a coding algorithm. Select mu-law (default) for North American and Japan; A-Law for the rest of the world.

Rx Gain: (option field) adjusts the PCM receive signal gain from -6dB to +8dB.

Tx Gain: (option field) adjusts the PCM transmit signal gain from -6dB to +8dB.

Use Default Settings = [D] : (option field) press D to return your selections to the default settings.

Configured Rear Card Type and Actual Rear Card Type: Select and configure the rear card type to E&M, FXO, or FXS. If the configured type is different from the actual rear card type detected by the system, then *only* change the rear card type setting.



NOTE:

If the configuration file is not present, the default setting for the rear card is FXO.

Operation Mode: The operation mode is PCM.

Backplane Status: A status that enables the card to communicate with the DACS II AX Backplane.

Diagnostics Menu

This menu allows the user to perform various diagnostics on a selected port out of eight available ports. The user should be able to perform these tests without affecting the performance of the other ports that are not being tested.


NOTE:

The E&M, FXO, and FXS interface cards have the same diagnostics functionality. The following steps are applicable for all three interface cards.

Set Up Diagnostics

To setup Diagnostics:

1. From the Voice Card Main Menu, select Diagnostics. Place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies   DACS II AX - Octal Voice   Slot: 04   Help = [?]

                                Octal Voice Card Diagnostics

Port#  Name      Test Type                                Port Status    Run Time
-----
01     Port01    Normal Operation                                In Service     471515
02     Port02    Normal Operation                                In Service     471515
03     Port03    Normal Operation                                In Service     471515
04     Port04    Normal Operation                                In Service     471515
05     Port05    Normal Operation                                In Service     471515
06     Port06    Normal Operation                                In Service     471515
07     Port07    Normal Operation                                In Service     471515
08     Port08    Normal Operation                                In Service     471515

Current Backplane Status.....: On the Bus
Clear Run Time      = [R]
Clear All Counters = [A]
  
```

Figure 18-17. Diagnostics Menu

2. Place your cursor on a port number and press **<Enter>**. The following submenu appears:

**NOTE:**

Only the ports that are "In Service" are accessible for diagnostics.

Lucent Technologies DACS II AX - Octal Voice Slot: 04 Help = [?]

Octal Voice Card Diagnostics

Port# Selected....: 1
Name.....: Port01
Select Test Type..: Normal Operation

Tone Generator Setup = [S]
...

Figure 18-18. Diagnostics Submenu

Diagnostics Field Descriptions

The following fields appear on the Diagnostics submenu (Figure 18-18).

Port #: The port number selected from the Diagnostics menu.

Name: The name given by the user at the Diagnostics menu.

Test Type: A host of tests can be run on a selected port; however, there should only be one Digital Loopback test active per voice card at a time. When the test type is set to Normal Operation, no other tests can run on that particular port.

To select a *Test Type*, place your cursor on the Test Type field and press **<Enter>** to scroll through the following available options:

- **Normal Operation** - Eight maximum configured tests per card. When the port is set to Normal Operation, no other tests should run on that port. This should be the default setting, at power up, for all ports.
- **Digital Loopback** - Permits testing of logic that generates timing for the transmit and receive highways. One configured test on any of the 8 channels. The channel mapping should be done before running this test. The test should be performed on the channel according to the channel mapping. The elapsed time since the test is enabled should be displayed and updated every one second.
- **Analog Loopback** - Confirms backplane interface logic and transmit/receive highway timing/control are fully functional. Eight maximum configured tests per card. The channel mapping should be done before performing this test. The test should be performed on the channel according to the channel mapping. The elapsed time since the test is enabled should be displayed and updated every one second.
- **Backplane Loopback** - Eight maximum configured tests per card. Put the channel in the backplane loopback by forcing the destination time slot to be the same as the source time slot.
- **Backplane Loopback with Tx idle** - Eight maximum configured tests per card.
- **Transmit Idle Pattern** - Eight maximum configured tests per card. There are no extra settings to do this test. However, you must enable the test. The elapsed time since the test is enabled should be displayed and updated every one second.
- **Receive Idle Pattern** - Eight maximum configured tests per card. There are no extra settings to do this test. However, you must enable the test. The elapsed time since the test is enabled should be displayed and updated every one second.

- **Tone Generator** - Eight maximum configured tests per card. When you select Tone Generator, this allows an adjustment of the receive gain control from -36dB to -6dB. You can select either DTMF tone or other tones. The DTMF tone frequency ranges from (697 Hz + 1209 Hz) to (941 Hz + 1633 Hz). The other tone frequency ranges from (1k, 16 Hz modulation) to (2100 Hz, single tone). Select from these tone frequencies during testing. The elapsed time since the test is enabled should be displayed and updated every one second.

**NOTE:**

To setup or select Tone Generator, place your cursor on the Test Type field and scroll through the options until you reach Tone Generator. Press **S** and the following submenu appears.

```
Lucent Technologies   DACS II AX - Octal Voice   Slot: 04   Help = [?]  
  
Octal Voice Card Diagnostics  
  
-----  
Port# Selected....: 1  
Name.....: Port01  
Select Test Type..: Tone Generator  
Tone Type.....: Other  
Tone Frequency....: 1k/1333 Hz, 16 Hz mod  
Tone Gain.....: -36 dB
```

Figure 18-19. Tone Generator Submenu

Upon entering the Tone Generator setup screen, all of the configurable fields display default values. The following fields appear on the Tone Generator submenu (Figure 18-19).

Port Status: (option field) This field determines the status of the port. The status will either be *In Service* or *Out of Service*.

Run Time: Displays a running time of the currently active port.

Current Backplane Status: An *On-line/Off-line* status that enables the card to communicate with the DACS II AX Backplane.

Clear Run Time: Resets the run time of the currently active port back to zero.

Clear All Counters: Resets the values of all ports back to zero.

Utilities Menu

This menu allows the user to display the card's status, CODEC registers content, and various system memory contents.

**NOTE:**

The E&M, FXO, and FXS interface cards have the same utilities functionality. The following steps are applicable for all three interface cards.

Access Utilities

To access the Utilities:

1. From the Voice Card Main Menu, select Utilities. Place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

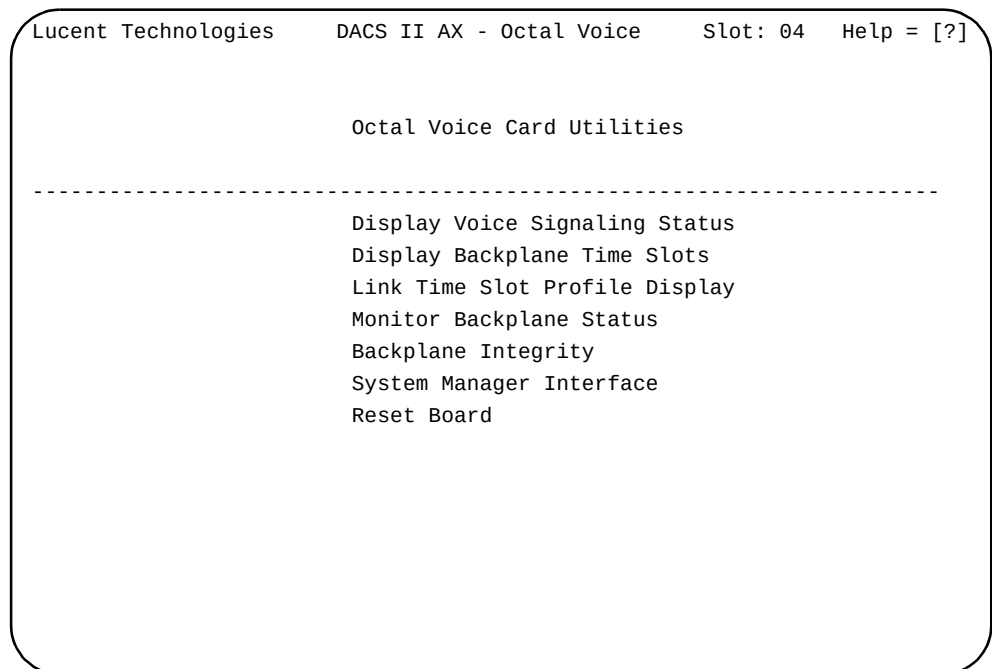


Figure 18-20. Utilities Menu

**Display Voice
Signaling Status**

To access the Display Voice Signaling Status:

1. From the Octal Voice Card Utilities Menu, place your cursor on the *Display Voice Signaling Status* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies   DACS II AX - Octal Voice   Slot: 04   Help = [?]

Display Voice Signaling Status

'A' Status
'A' Transitions
Port#   Port Status   LOC   REM   LOC   REM
-----
01      In Service   On Hook   On Hook   0      0
02      In Service   On Hook   On Hook   0      0
03      In Service   On Hook   On Hook   0      0
04      In Service   On Hook   On Hook   0      0
05      In Service   On Hook   On Hook   0      0
06      In Service   On Hook   On Hook   0      0
07      In Service   On Hook   On Hook   0      0
08      In Service   On Hook   On Hook   0      0

Backplane Status.....: On the Bus
Reset Transitions = [R]

```

Figure 18-21. Display Voice Signaling Status Menu

The Display Voice Signaling Status screen shows the status of the **LOC**al and **REM**ote ends either on hook or off hook. The status should be displayed and refreshed in one second intervals.

2. To reset the on/off hook transition counts press **[R]**.
3. Press **X** to return to the previous menu.

Voice Signaling Status Field Descriptions

The following fields appear on the Display Voice Signaling Status screen (Figure 18-21).

Port #: The port number selected.

Port Status: (option field) This field determines the status of the port. The status will either be *In Service* or *Out Of Service*.

A Status: This field records when the LOCal and REMote ends are *On Hook* or *Off Hook*. LOC and REM are independent of each other. A status of *On Hook* means LOC and/or REM are inactive; a status of *Off Hook* means LOC and REM are active. When both LOC and REM have a status of *Off Hook*, there is complete communication between them.

A Transitions: This field records how often the hook status changes.

**Display Backplane
Time Slots**

To access the Display Backplane Time Slots:

1. From the Octal Voice Card Utilities Menu, place your cursor on the *Display Backplane Time Slots* field and press **<Enter>**. The following screen appears:

```
Lucent Technologies      DACS II AX - Octal Voice      Slot: 03      Help = [?]
```

Display Backplane Time Slots

Port#	To Bkpl TS	From Bkpl TS	DEN Status	DEN Verify	CEN Status
01	00041	00040	Enabled	Enabled	Enabled
02	00043	00042	Enabled	Enabled	Enabled
03	00045	00044	Enabled	Enabled	Enabled
04	00047	00046	Enabled	Enabled	Enabled
05	00049	00048	Enabled	Enabled	Enabled
06	00051	00050	Enabled	Enabled	Enabled
07	00054	00053	Enabled	Enabled	Enabled
08	00056	00055	Enabled	Enabled	Enabled

Figure 18-22. Display Backplane Time Slots Screen

The Display Backplane Time Slots information for all eight voice ports are displayed.

Backplane Time Slots Field Descriptions

The following fields appear on the Display Backplane Time Slots screen (Figure 18-22).

Port #: The port number selected.

To Bkpl TS: Each port requires a single timeslot to communicate with the SMC. The number that appears in the To Bkpl TS column displays the actual timeslot if a connection was made. If a connection was not made then the timeslot will display all zeroes.

From Bkpl TS: Each port requires a single timeslot to communicate to the SMC. The number that appears in the From Bkpl TS column displays the actual timeslot if a connection was made. If a connection was not made then the timeslot will display all zeroes.

DEN Status: Data Enable Status. This field determines whether the hardware can write data to the backplane. The status will either be *Enabled*, meaning there is no connection, or *Disabled*, meaning the port is not configured.



NOTE:

The DEN Status is controlled by the type of connection used to the SMC. In order for data to be transmitted, both DEN and CEN must be Enabled. If data is not being transmitted, refer to Add a New Connection in Chapter 5, and verify that the Voice/Data field reads Data.

DEN Verify: Data Enable Verification. Verifies the DEN status.

CEN Status: Control Enable Status. This field determines whether the signaling information will be sent over the backplane. The status will either be *Enabled* or *Disabled*.

**Access Link
Timeslot Profile**

To access the Link Time Slot Profile Display:

1. From the Octal Voice Card Utilities Menu, place your cursor on the *Link Time Slot Profile Display* field and press **<Enter>**. The following menu appears:

Lucent Technologies

DACS II AX - Octal Voice

Slot: 03

Help = [?]

Link Timeslot Profile Manager

Link	Ts	ConnectionType	To LinkBts	From LinkBts	Bus	Voice	TestId	Linked Slot#
01	01	Full Duplex	00040	00041	A	Voice	00(00)	04
02	01	Full Duplex	00042	00043	A	Voice	00(00)	04
03	01	Full Duplex	00044	00045	A	Voice	00(00)	04
04	01	Full Duplex	00046	00047	A	Voice	00(00)	04
05	01	Full Duplex	00048	00049	A	Voice	00(00)	04
06	01	Full Duplex	00050	00051	A	Voice	00(00)	04
07	01	Full Duplex	00053	00054	A	Voice	00(00)	04
08	01	Full Duplex	00055	00056	A	Voice	00(00)	04

Number of Active Connections.....: 8

Next Page = [N]

Figure 18-23. Link Time Slot Profile Manager Menu

This menu displays the number of active connections on the link. Press **[N]** to view additional connections.

2. Press **X** to return to the previous menu.

**Monitor
Backplane Status**

To access the Monitor Backplane Status:

1. From the Octal Voice Card Utilities Menu, place your cursor on the *Monitor Backplane Status* field and press **<Enter>**. The following menu appears:

Lucent Technologies DACS II AX - Octal Voice Slot: 04 Help = [?]

Monitor Backplane Status

Description	Transitions

Current Backplane Status.....	On the Bus
Card Service Status.....	In Service
System Ready To Go In Service.....	Yes 1
System Clock Status.....	Present 0
Frame SYNC Signal Status.....	Present 0
Too Many Backplane Time Slots ON.....	No 0
Receive TSFM Map.....	Yes 2
Hardware Access to Memory.....	No

Card In Service = [I]
Card Out Of Service = [O]
Reset Counters = [R]

Figure 18-24. Monitor Backplane Status Menu

Monitor Backplane Status Field Descriptions

The following fields appear on the Monitor Backplane Status screen (Figure 18-24).

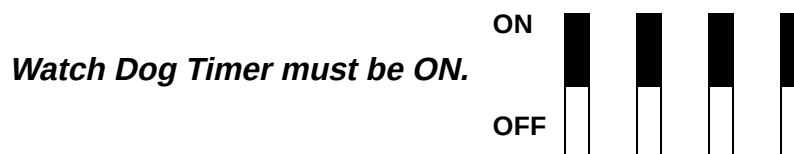
Current Backplane Status: *On-line/Off-line* status that enables the card to communicate with the DACS II AX Backplane.

Card Service Status: Shows the status of the board.

System Ready To Go In Service: Shows whether the card is good or bad.

System Clock Status: A watchdog timer that monitors the integrity of the backplane clock. This clock is critical to backplane operation.

Frame SYNC Signal Status: A watchdog timer that monitors the integrity of the sync signal that coordinates data flow on the backplane. Critical to backplane operation.



The Watch Dog Timer is a factory set switch. Do not tamper with this switch.

Too Many Backplane Time Slots ON: A watchdog timer that monitors access to the backplane by this card. Protects the system from a faulty card corrupting data on the backplane.

Receive TSFM Map: Signals the hardware when to use the backplane.

Hardware Access to Memory: A way for the software to disable the memory for testing purposes.

The following hot keys invoke additional screens and/or functions:

- Card In Service = [I]
- Card Out Of Service = [O]
- Reset Counters = [R]

**Monitor
Backplane
Integrity**

To access the Monitor Backplane Integrity:

1. From the Octal Voice Card Utilities Menu, place your cursor on the *Monitor Backplane Integrity* field and press **<Enter>**. The following screen appears:

Lucent Technologies

DACS II AX - Octal Voice

Slot: 04

Help = [?]

Monitor Backplane Integrity

Slot#	Slot # Address	Slot # Received	Pattern Address	Pattern Received (Ignore for QHS)	Status
01	0x00202807	01	0x00202808	07	... OK ...
02	0x00202809	02	0x0020280A	0A	... OK ...
03	0x0020280B	03	0x0020280C	0E	... OK ...
04	0x0020280D	04	0x0020280E	09	... OK ...
05	0x0020280F	08	0x00202810	08	
06	0x00202811	08	0x00202812	08	
07	0x00202813	08	0x00202814	08	
08	0x00202815	08	0x00202816	08	... OK ...
09	0x00202817	08	0x00202818	08	
10	0x00202819	08	0x0020281A	08	
11	0x0020281B	08	0x0020281C	08	

Figure 18-25. Monitor Backplane Integrity Screen

This screen displays the backplane integrity of all slots to indicate if the card is on the buss or not. This screen is used by Technical Support personnel.

2. Press **X** to return to the previous menu.

**Display System
Manager Interface
Status**

To access the System Manager Interface Status:

1. From the Octal Voice Card Utilities Menu, place your cursor on the *System Manager Interface Status* field and press **<Enter>**. The following screen appears:

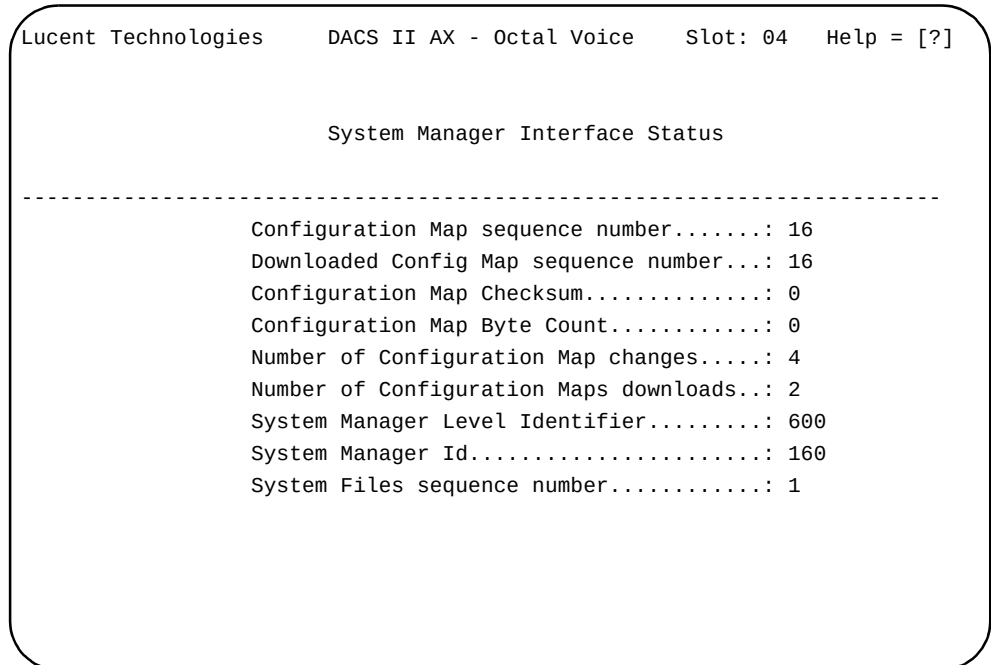


Figure 18-26. System Manager Interface Status Screen

This screen allows you to view System Manager Interface Statistics, such as map checksum or byte count.

2. Press **X** to return to the previous menu.

Reset Board

To access Reset Board:

1. From the Octal Voice Card Utilities Menu, place your cursor on the *Reset Board* field and press **<Enter>**. The following menu appears:

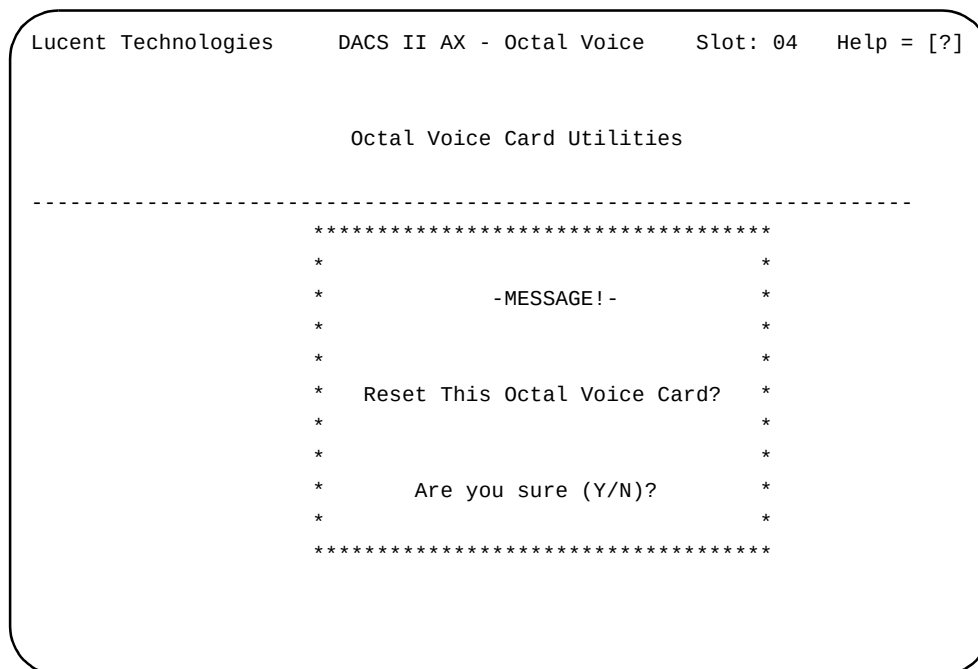


Figure 18-27. Reset Board Menu

Reset Board causes the card to initialize in the same manner as power up. During this boot up cycle, no user data will flow. Since the configuration resides on the SMC, connections will be restored.

2. Press **X** to return to the previous menu.

Reset Octal Voice Card

To reset the Octal Voice Card:

1. From the Octal Voice Card Utilities Menu, place your cursor on the Reset Board field and press **<Enter>**.
2. A new message appears: "Reset This Octal Voice Card? Are you sure (Y/N)?" Press **Y** to reset, or **N** if you do not want to reset the device.

**NOTE:**

If you select N, and do not wish to reset the Octal Voice Board, the screen will return to the Octal Voice Utilities menu. Press X to return to the Voice Card Main Menu, and select About.

About Menu

This menu displays information, specific to the selected voice card. Information like the voice card's software version number, software release date, Xilinx version number, and checksum is displayed here.

The E&M, FXO, and FXS interface cards have similar identification information. The only difference is the Rear Card Type field displays the current installed interface card.

Display About Menu

To display identification information:

1. From the Voice Card Main Menu, select About. Place your cursor on the *About* field and press **<Enter>**. The following screen appears:

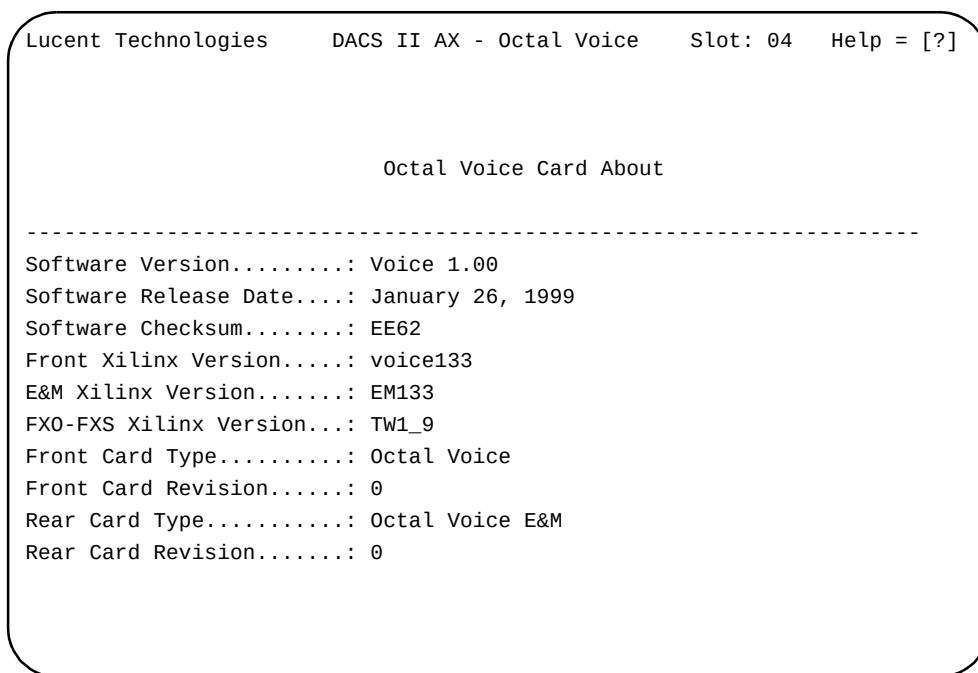


Figure 18-28. Sample About Menu

2. Press **X** to return to the previous menu.

About Field Descriptions

The following fields appear on the Octal Voice About menu (Figure 18-28).

Version: This is the software version current in the Octal Voice's flash memory.

Release Date: The engineering release to production.

Checksum: The sum of all bytes in the Octal Voice card's flash memory at power up.

XILINX Version: The hardware version of downloadable, programmable devices.

Front Card Type: Displays the type of board in the system.

Front Card Rev: Displays the board's revision level.

Rear Card Type: Displays the type of board in the system.

Rear Card Rev: Displays the board's revision level.

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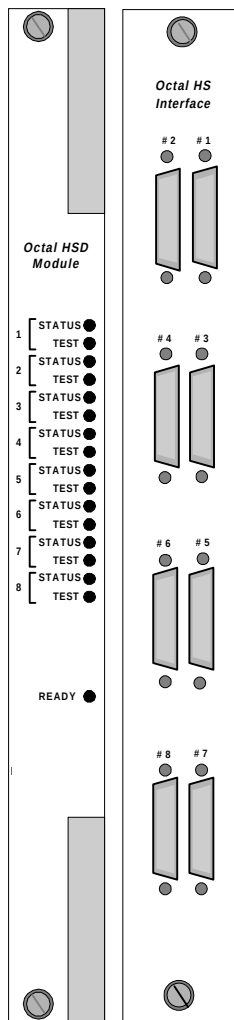
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Physical Description

The Octal High Speed Data (OHSD) Module Set provides the same capabilities as the Quad High Speed (QHS) module set, as well as expanded capabilities. This module also offers the capability to support DS0-A (9.6K) subrate data traffic and NxDS0 and NxDS0-A (9.6K) Special operating modes. The OHSD module further extends this capability with eight soft-selectable ports, six electrical interfaces including ITU-X.21 and enhanced high speed operation.

The OHSD supports multi-tenant access, wireless services infrastructures and large scale corporate enterprises.

Thumb screws are provided at the top and bottom of the bezels to secure the module in the chassis and to make an electrical connection to frame ground for regulatory emission compliance. The electrical connection to frame ground also protects the Octal High Speed interface module from static discharge.



NOTE:

The N + 1 Protection Switch does not supply redundancy for the Octal High Speed Data module set.

Figure 19-1. OHSD Application/Interface Module Set

LED Indicators

There are eight visual port-level Status and Test indicators located on the front bezel of the application module.

STATUS

STATUS - A green LED indicates the port is in service, the associated timeslots are cross-connected and there are no errors. A red LED indicates an error condition occurred. The error condition could result from one or all of the following conditions: TX FIFO overflow/underflow; RX FIFO overflow/underflow; wrong edge of incoming clock is being used. The LED indicator will be off if the port is Out of Service or if there is no environment established.

Table 19-1. OHSD Port-Level Indicators - STATUS

STATUS	ERROR STATE	CONNECTION STATE	LED STATE	LED COLOR
Port In Service (Port Configuration Menu)	No Errors (Port Diagnostics Manager Menu)	Connection (Port Configuration Menu)	ON	GREEN
Port In Service (Port Configuration Menu)	No Errors (Port Diagnostics Manager Menu)	NoConn (Port Configuration Menu)	OFF	NA
Port In Service (Port Configuration Menu)	TX FIFO and/or RX FIFO and/or CLOCK EDGE (Expose Menu from the Port Diagnostics Manager Menu)	Connection (Port Configuration Menu)	ON	RED
Port Out of Service (Port Configuration Menu)	No Errors (Port Diagnostics Manager Menu)	NA	OFF	NA

TEST

TEST - A solid yellow LED indicates a loopback is active and/or a BERT test is active with no errors. A flashing yellow LED indicates there is a BERT error. The LED indicator will be OFF if there are no port diagnostics in progress.

Table 19-2. OHSD Port-Level Indicators - TEST

TEST	CONDITION	LED STATE	LED COLOR
BERT	No Error	ON	Solid YELLOW
BERT	With Error	ON	Flashing YELLOW
LOOP	NA	ON	Solid YELLOW
NONE	NA	OFF	NA

READY

READY - A solid green LED indicates the application module is in service and operational. A flashing green LED indicates the module is awaiting configuration information from the SMC. A red LED indicates a global card fault (i.e., the processor or memory is not operational).

Table 19-3. OHSD Module-Level Indicator - READY

READY (Condition)	LED STATE	LED COLOR
Module In Service & Operational	ON	Solid GREEN
Module awaiting configuration from the SMC	ON	Flashing GREEN
Global Card Fault (processor/memory nonoperational)	ON	RED
Module Out of Service	OFF	NA

Regulatory Information

North America

The Octal High Speed Data Module equipment complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the rear card must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Product Safety

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Before You Begin

- This chapter is for ADMINISTRATOR-level users.
 - A slot must first be configured for the module type and the Octal High Speed module must be resident in a slot in the equipment nest. An Octal High Speed interface module must also be resident in the same numbered slot as the Octal High Speed application module. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4.
 - For DS0-A (9.6K) substrate data traffic and NxDS0-A (9.6K) Special operating modes, a connection map must first be configured with a speed of 56 Kbps (1 DS0) at the Active Map Menu. For NxDS0 and NxDS0 Special operating modes, the connection map can be configured with any speed at the Active Map Menu. Refer to Chapter 5 for information on connection maps.
 - For cabling and interface requirements, refer to Appendix B in this manual.
-

External Timing Mode

When you select the External timing mode, the DCE provides the OHSD with the terminal timing information necessary via a cross-over cable which is necessary to clock both the transmit and receive data at both ends. The timing reference for this application is derived from the CPE source, however, the cross-connect fabric is still managed by the SMC timing reference. Therefore, both the SMC and the CPE sources need to be referenced back to the same clock (e.g., Stratum-level reference) or slips will occur.

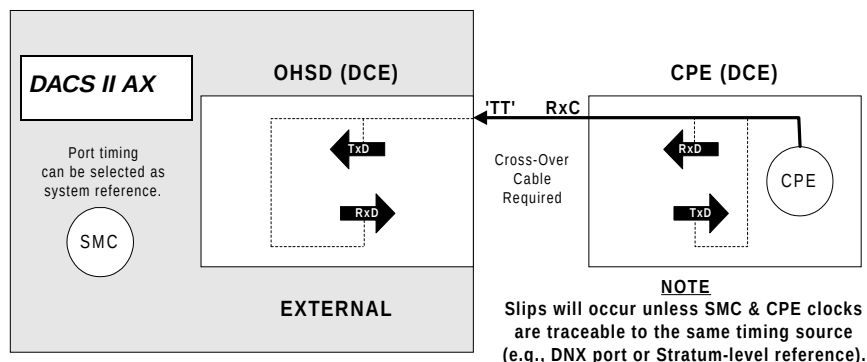


Figure 19-3. External Timing mode clock and data relationship for a typical DTE application

**Internal/External
Timing Mode**

When you select the Internal/External timing mode, the OHSD provides the DTE with receive timing information necessary to clock the receive data to the DTE and accepts a clock for transmit data to the OHSD. Since there are separate timing sources for this application, both the SMC and CPE sources need to be referenced back to the same clock (e.g., Stratum-level reference) or slips will occur.

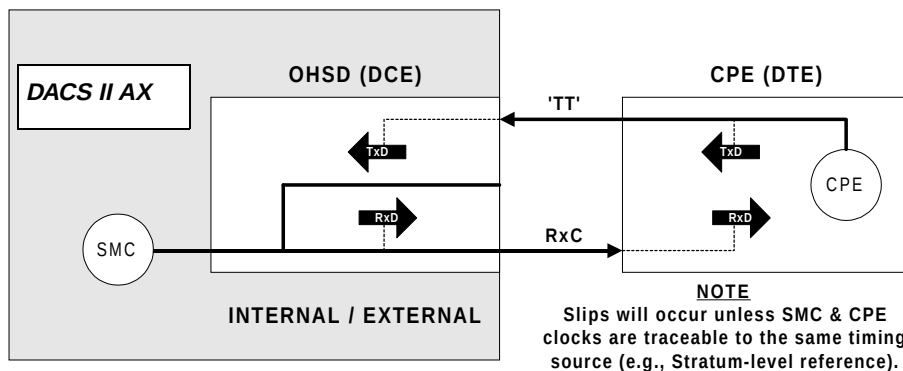


Figure 19-4. Internal/External Timing mode clock and data relationship for a typical DTE application

Software-Selectable Interfaces

The Octal High Speed Data (OHSD) module allows the DACS II AX to connect up to eight synchronous DCE ports, each of which can be configured from the console for EIA-232, EIA-422, EIA-530, EIA-530A, ITU- V.35 or ITU-X.21 operation.

Table 19-4. Software-Selectable Interfaces

Common Description	Octal HSD	EIA232	EIA 530	EIA 530A	EIA422	ITU V.35	ITU X.21
Chassis Ground	1 •	1	1	1	1	A	1
CTS (B)	2 →	--	13	13	27	--	12
RTS (B)	3 ←	--	19	19	25	--	10
RTS (A)	4 ←	4	4	4	7	C	3
CTS (A)	5 →	5	5	5	9	D	5
DSR (A)	6 →	6	6	6	11	E	--
Signal Ground	7 •	7	7	7	19	B	8
DCD (A)	8 →	8	8	8	13	F	--
Tx Data (A)	9 ←	2	2	2	4	P	2
Tx Data (B)	10 ←	--	14	14	22	S	9
Rx Data (A)	11 →	3	3	3	6	R	4
Rx Data (B)	12 →	--	16	16	24	T	11
Ext Tx Clock (A)	13 ←	24	24	24	17	U	--
DSR (B)	14 →	--	22	--	29	--	--
DTR (B)	15 ←	--	23	--	30	--	--
DCD (B)	16 →	--	10	10	31	--	--
--	17 --	--	--	--	--	--	--
--	18 --	--	--	--	--	--	--
--	19 --	--	--	--	--	--	--
DTR (A)	20 ←	20	20	20	12	H	--
Signal Ground	21 •	--	--	23	20	--	--
Tx Clock (A)	22 →	15	15	15	5	Y	6

Table 19-4. Software-Selectable Interfaces

Common Description	Octal HSD	EIA232	EIA 530	EIA 530A	EIA422	ITU V.35	ITU X.21
Tx Clock (B)	23 →	--	12	12	23	AA	13
Rx Clock (A)	24 →	17	17	17	8	V	--
Rx Clock (B)	25 →	--	9	9	26	X	--
Ext Tx Clock (B)	26 ←	--	11	11	35	W	--

Table 19-5. Software-Selectable Interfaces for Special Data Mode

Common Description	Octal HSD	EIA232	EIA 530	EIA 530A	EIA422	ITU V.35	ITU X.21
Chassis Ground	1 •	1	1	1	1	A	1
--	2 --	--	--	--	--	--	--
--	3 --	--	--	--	--	--	--
Remote Loop	4 ←	21	21	21	14	N	--
Test Mode	5 →	25	25	25	18	NN	--
DSR (A)	6 →	6	6	6	11	E	--
Signal Ground	7 •	7	7	7	19	B	8
DCD (A)	8 →	8	8	8	13	F	--
Tx Data (A)	9 ←	2	2	2	4	P	2
Tx Data (B)	10 ←	--	14	14	22	S	9
Rx Data (A)	11 →	3	3	3	6	R	4
Rx Data (B)	12 →	--	16	16	24	T	11
Ext Tx Clock (A)	13 ←	24	24	24	17	U	--
DSR (B)	14 →	--	22	--	29	--	--
--	15 ←	--	--	--	--	--	--
DCD (B)	16 →	--	10	10	31	--	--
--	17 --	--	--	--	--	--	--
--	18 --	--	--	--	--	--	--
--	19 --	--	--	--	--	--	--
Local Loop	20 ←	18	18	18	10	L	--
Signal Ground	21 •	--	--	23	20	--	--
Tx Clock (A)	22 →	15	15	15	5	Y	6
Tx Clock (B)	23 →	--	12	12	23	AA	13
Rx Clock (A)	24 →	17	17	17	8	V	--
Rx Clock (B)	25 →	--	9	9	26	X	--
Ext Tx Clock (B)	26 ←	--	11	11	35	W	--

Data Rates

The OHSD module supports data rates from DS0-A (9.6 K) subrate data, 48 Kbps up to 2.048 Mbps. The following table displays the data rates.

Based on the Table 19-6, the **N** multiple represents the number of DS0s or time slots allocated for a given circuit with the maximum per port value supported being 32. EIA-232 is limited to the N multiple less than or equal to two.

⇒ **NOTE:**
DS0-A (9.6 K) and 48 Kbps can only support 1 DS0.

Table 19-6. Data Rates

N	Nx56kbps	Nx64kbps	N	Nx56kbps	Nx64kbps
1	56	64	17	952	1088
2	112	128	18	1008	1152
3	168	192	19	1064	1216
4	224	256	20	1120	1280
5	280	320	21	1176	1344
6	336	384	22	1232	1408
7	392	448	23	1288	1472
8	448	512	24	1344	1536
9	504	576	25	1400	1600
10	560	640	26	1456	1664
11	616	704	27	1512	1728
12	672	768	28	1568	1792
13	728	832	29	1624	1856
14	784	896	30	1680	1920
15	840	960	31	1736	1984
16	896	1024	32	1792	2048

⇒ **NOTE:**
Data rates displayed in bold face are common multiples.

Control Signals

To support a variety of field installations and user applications, selective control of specific signal leads is provided. In addition to DSR and DCD, which were supported by the Quad High Speed module, CTS has been added. With this addition, the option to track RTS is supported for the industry standard CTS along with DCD for consistency. All control signals are operated via the DCE/DTE port interfaces and none are transported across the cross-connect fabric. The following table represents the control lead options available.

Table 19-7. Control Lead Options

Option	DSR	CTS	DCD
ON	ON	ON	ON
OFF	OFF	OFF	OFF
TRACK	DTR	RTS	RTS

When using the *Special* mode, DTE LL/RL Loop can be enabled or disabled. The following table represents the control lead options available for *Special* mode.

Table 19-8. Control Lead Options for Special Mode

Option	DSR	DCD	DTE
ON	ON	ON	ENABLE
OFF	OFF	OFF	DISABLE

Diagnostics

The integral-testing capability of the Octal High Speed Data module offers a mix of loopback and bit error rate testing capabilities, along with the ability to monitor selective control leads and port component errors. These diagnostics are provided to facilitate installation and troubleshooting activities both locally and remotely whether the port is In Service or Out of Service.

Local Loopback

The local loopback is performed bi-directionally as close to the DTE interface module as practical. Once such a loopback is initiated, via the SMC, it will stay in place until commanded to terminate this loop (or reconfigure the port) and restore user traffic flow. This loopback can be utilized to confirm faults and isolate the source of a problem using BERTs.

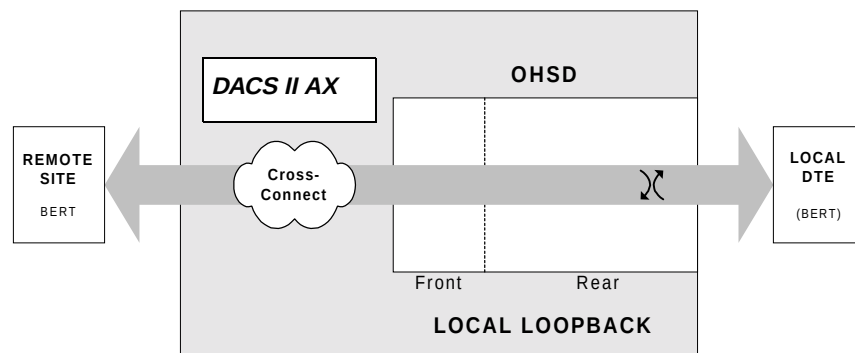


Figure 19-5. External testing using a Local Loopback

V.54 Loopback

The local loopback facility can be controlled remotely via in-band ITU-V.54 compliant commands, thereby providing a V.54 loopback capability. Once the appropriate loop-up procedures are completed, you can perform testing and issue the remote necessary loop down pattern and perform a test. Due to the bi-directional nature of the resultant loopback, BER testing can be performed from the local DTE as well; however, only the remote site can issue the loop-down codes.

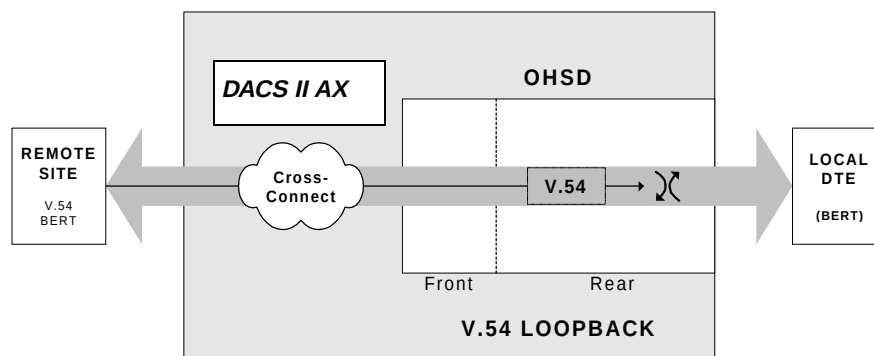


Figure 19-6. External testing using a V.54 Loopback

Remote Loopback

An OHSD V.54 pattern generator is provided to loop traffic at the remote site (away from the local DTE). Once the remote loopback is established, the on-board BERT is available to troubleshoot the circuit, if desired.

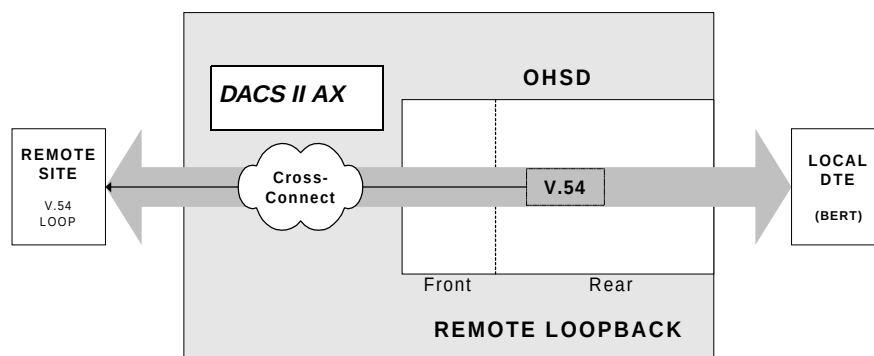


Figure 19-7. External testing using a Remote Loopback

Backplane Loopback

A Backplane Loopback is a useful diagnostic to fully test the port integrity of the OHSD module set as a whole.

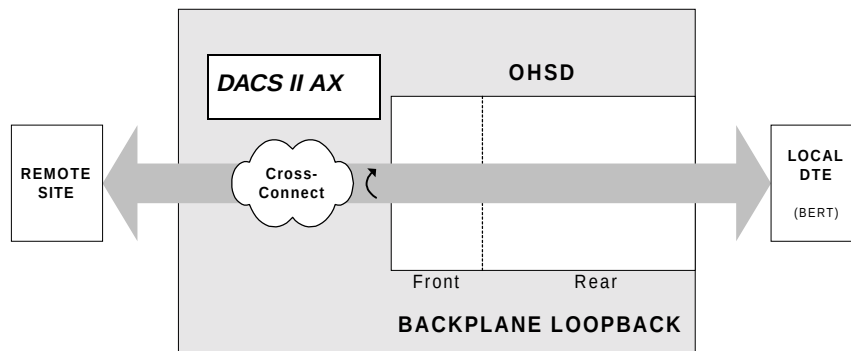


Figure 19-8. External testing using a Backplane Loopback

BERT Test

In addition to individual port-level loopbacks, independent BERTs provide support to circuit-level diagnostics. Each BERT will simultaneously support bi-directional analysis using operator selectable "All Ones," "All Zeros," and a "pseudorandom 2047" pattern. Bit errors may be inserted to confirm the establishment of loopbacks.

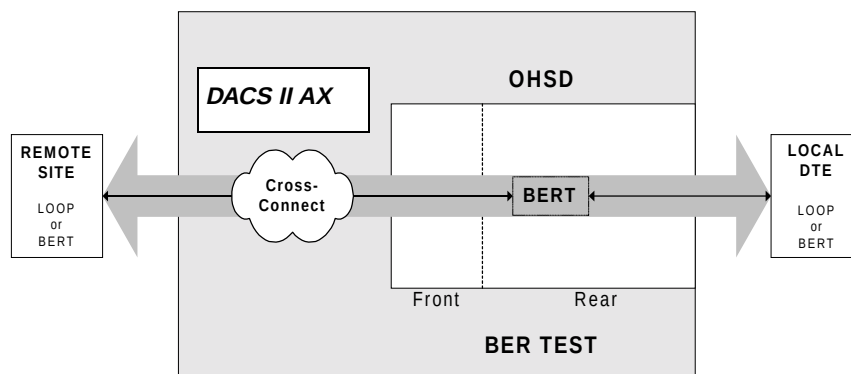


Figure 19-9. External testing using a Bit Error Rate Test

**Remote OCU
Non-Latching Test**

To activate this test, the test center sends repetitive bytes of the applicable loopback code toward the remote side. The DCE at the remote end must initiate a loopback condition when it detects an appropriate number of error-free loopback code bytes.

Once a loopback is established, the test data must be interleaved on a byte-by-byte basis with the applicable network loopback code in order to maintain the loopback. A non-latching test operates upon the receipt of (a minimum of) four consecutive bytes of the specified loopback code at the proper data rate and remains in place as long as every other byte contains the loopback code. This continues for a minimum of four consecutive bytes after receipt of the last loopback code.

When in loopback state, the loopback code bytes must be mapped to a defined code back toward the test center to synchronize the test pattern detector.

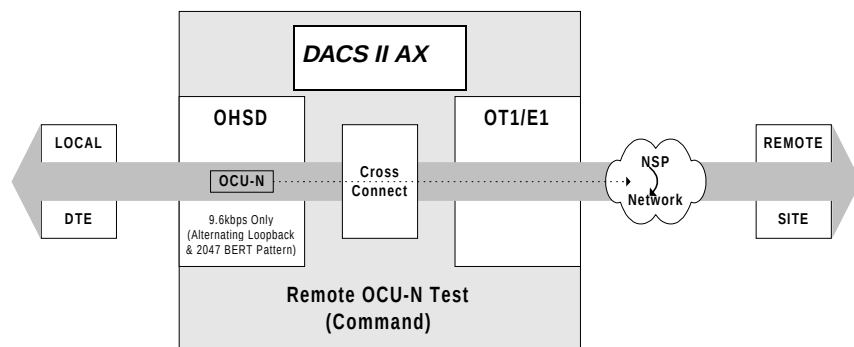


Figure 19-10. Remote OCU Non-Latching Test

Slot Configuration

Procedure - Configure Slot

To configure a slot for the Octal High Speed Data module:

1. From the DACS II AX Main Menu, select *System Configuration* field, then select Slot Configuration.

The *Slot Configuration* menu appears displaying slots numbered from 1 to 4 (DACS II AX-4) or 1 to 11 (DACS II AX-11).

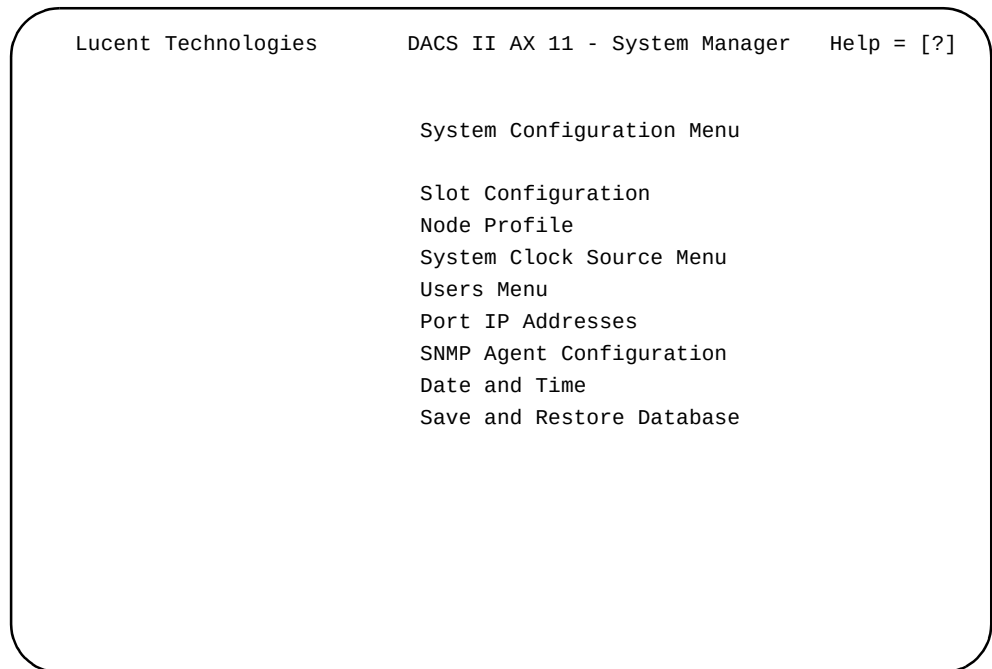
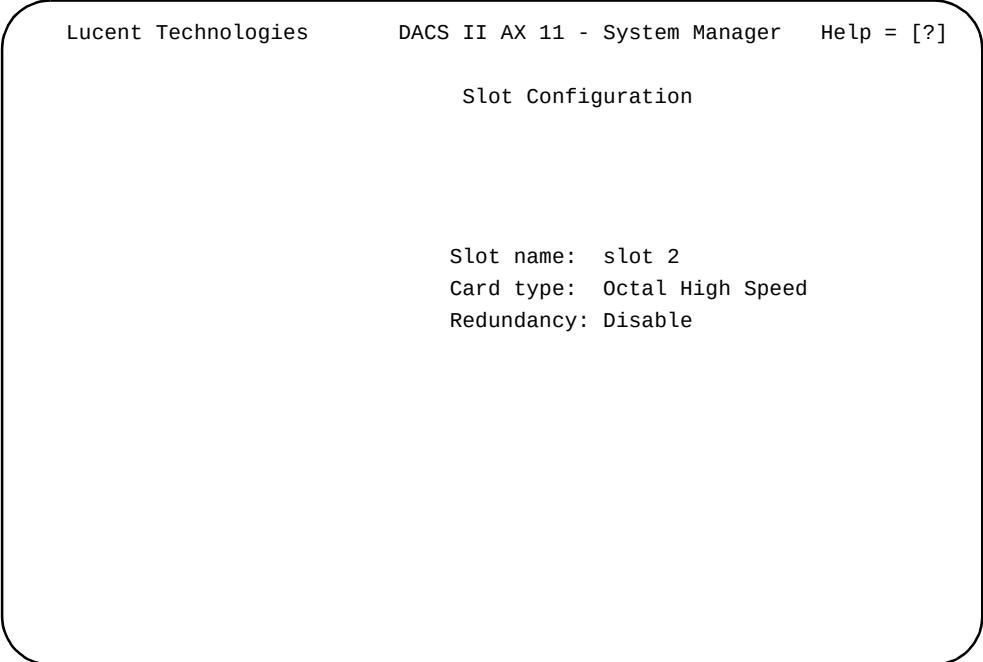


Figure 19-11. Slot Configuration Menu

2. Place your cursor on the desired slot #, where your Octal High Speed Data module will reside, and press **<Enter>**. The *Slot Configuration* submenu appears.



```
Lucent Technologies      DACS II AX 11 - System Manager  Help = [?]  
  
Slot Configuration  
  
Slot name:  slot 2  
Card type:  Octal High Speed  
Redundancy: Disable
```

Figure 19-12. Slot Configuration Submenu

3. At the *Slot Configuration* submenu, place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number and press **<Enter>** again.
4. Move your cursor to the *Card Type* field and press **<Enter>** key until "Octal High Speed" is displayed.
5. Press **X** to save your configuration and return to the previous menu.

The same procedure applies when replacing an existing card in a slot.

To delete a card, press **D** and a message appears stating, "All existing connections for this slot will be deleted." Press Y(es) to confirm the action or N(o) to discontinue. If you want the empty slot to display as a blank, pull the module and restart the DACS II AX. If you do not remove the card prior to pressing **D**, the following message appears: "-ALERT!- Can not delete a device that is present."

Octal High Speed Data Main Menu

Procedure - Access Main Menu To access the Main Menu:

1. From the *DACS II AX Main Menu*, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
Databases: InSync           N+1 Redundancy State: Disabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#  Configured Type      Device State  Alarm
-----
01     + Octal T1/E1        Standby      None
02     Octal High Speed    Online       None
03     + Octal T1/E1        Online       None      Clock Src
04     + Octal T1/E1        Online       None
05     + Octal T1/E1        Online       None
06     + Octal T1/E1        Online       None
07     + Octal T1/E1        Online       None
08     + Octal T1/E1        Online       None
09     + Octal T1/E1        Online       None
10     + T3                 Online       None
11     + T3                 Standby      None
SMCA   System Manager A    Standby      None
SMCB   System Manager B    Online       None
PSX    ProtectionSwitch    Not present  None

[C]lear error counts  [S]lot Cfg      [E]xpose  [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver  [R]estore

```

Figure 19-13. Node Summary Menu

2. Place your cursor on the slot number where the Octal High Speed module is located and press **<Enter>**. The *Main Menu* appears.

**NOTE:**

On the Node Summary Menu, the Configured Type must display "Octal High Speed" and the Device State must display "On-line" or "Standby" in order to access the Octal High Speed Module Main Menu. If the Device State is "Off-line," an alert message is generated.

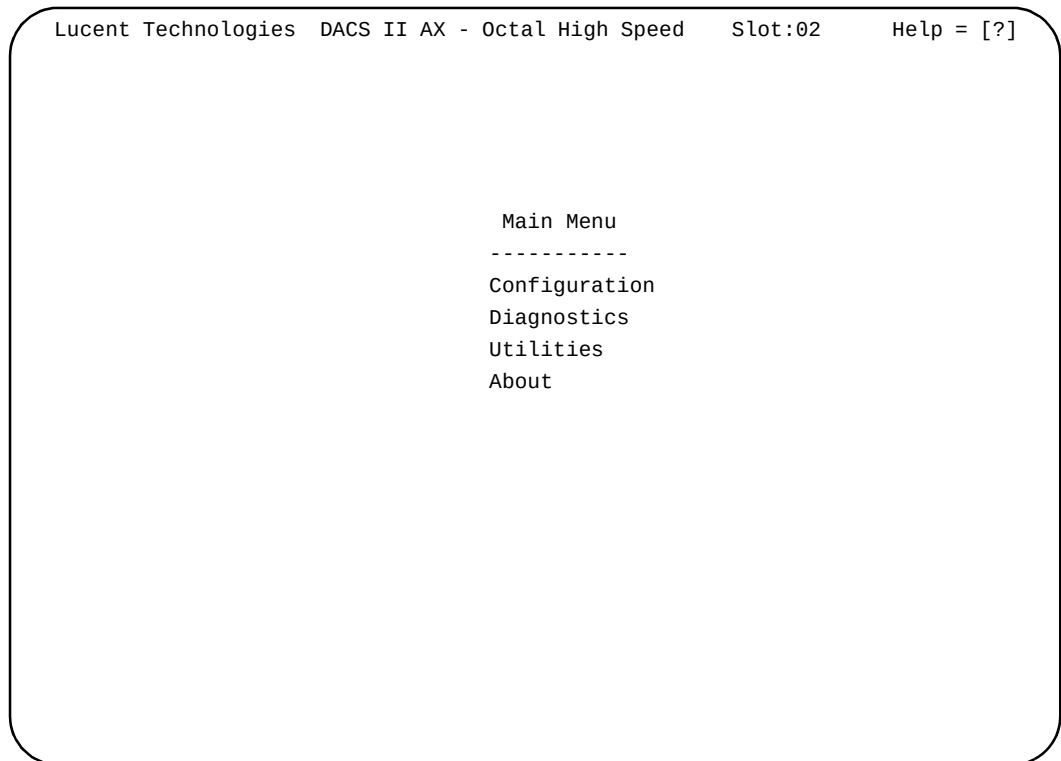


Figure 19-14. Octal High Speed Main Menu

From the *OHSD Main Menu*, you can configure the module, run diagnostic tests, access utilities, and display module identification.

Configuration Menu

The Octal High Speed Configuration Menu provides access to a port configuration submenu. From here, you can configure the ports. When an Octal High Speed card is replaced, the old configuration is preserved.

Configure Ports

To configure the ports:



NOTE:

Prior to entering the Ports Configuration Menu to configure the ports, you must set up a cross connection map. Refer to the "Connection Maps" section in Chapter 4 of this manual to activate and configure connection maps. Additionally, when selecting DS0-A (9.6K) and DS0-A Special, you must set the speed to 56Kbps (1 DS0).

1. From the *OHSD Main Menu* place the cursor on the *Configuration* field, press **<Enter>**. The following menu appears:

Lucent Technologies

DACS II AX - Octal High Speed

Slot:02

Help = [?]

Ports Configuration

	Name	Type	Rate	xN	Timing	Data	Clock	DSR	DCD	CTS/I	Enable Loops V54 DTE
1	Port Name 1	V.35	56K	-01	Int	Normal	Normal	F-On	F-Off	F-Off	Yes No
2	Port Name 2	V.35	56K	-01	Int	Normal	Normal	F-On	F-On	F-Off	Yes No
3	Port Name 3	V.35	56K	-01	Int	Normal	Normal	F-On	F-Off		Yes
4	Port Name 4	V.35	56K	-01	Int	Normal	Normal	F-On	F-Off		Yes
5	Port Name	Out Of Service									
6	Port Name	Out Of Service									
7	Port Name	Out Of Service									
8	Port Name	Out Of Service									

Figure 19-15. Ports Configuration Menu

Place the cursor on any port number and press **<Enter>**. The following submenu appears:

```
Lucent Technologies   DACS II AX - Octal High Speed   Slot:02   Help = [?]  
  
                        Port Configuration  
                        -----  
  
Port Number.....: 2  
Name.....: Port Name 2  
Status.....: In Service  
Mode.....: DS0-A (9.6K)  
Type.....: ITU-V.35  
Data.....: Normal  
Clock.....: Normal  
V.54 Network Loop...: Enable  
Timing.....: Int  
DSR.....: Force On  
DCD.....: Force On  
CTS.....: Force Off
```

Figure 19-16. Port Configuration Submenu

2. To change a field's configuration, press the **<Spacebar>** to move to the field to be configured and press **<Enter>** to toggle between the field's options.

The *Port Configuration* submenu will show different options, as shown on the following pages, depending upon the *Mode* and *Type* you select.

When the *Mode* selection is *DS0-A (9.6K)* or *NxDS0*, the following screen appears:

```
Lucent Technologies      DACS II AX - Octal High Speed      Slot:02      Help = [?]  
  
                          Port Configuration  
                          -----  
  
Port Number.....: 2  
Name.....: Port Name 2  
Status.....: In Service  
Mode.....: DS0-A (9.6K)  
Type.....: ITU-V.35  
Data.....: Normal  
Clock.....: Normal  
V.54 Network Loop...: Enable  
Timing.....: Int  
DSR.....: Force On  
DCD.....: Force On  
CTS.....: Force Off
```

Figure 19-17. Port 2 Configured for DS0-A (9.6K) or NxDS0

The control signal operations DSR, DCD and CTS are available.

When the *Mode* selection is *DS0-A Special* or *NxDS0 Special*, the following screen appears:

Lucent Technologies DACS II AX - Octal High Speed Slot:02 Help = [?]

Port Configuration

Port Number.....: 1
Name.....: Remote
Status.....: In Service
Mode.....: DS0-A Special
Type.....: ITU-V.35
Data.....: Normal
Clock.....: Normal
V.54 Network Loop...: Enable
Timing.....: Int
DCD.....: Force Off
DSR.....: Force On
DTE (LL/RL) Loop....: Disable

yyy

Figure 19-18. Port 1 configured for DS0-A Special or NxDS0 Special Mode

When using the *Special* data rate mode, the control signal CTS is no longer valid. Track DTR is being re-used as Local Loop and Track RTS is being re-used as Remote Loop on the DTE. You also have the option to *Enable* or *Disable* the capability of issuing loopback commands via the DTE interface. *Electrical Interface (EI) Type ITU-X.21* is not available when using the *Special* data rate mode.

When you select mode *DS0-A (9.6K)* or *NxDS0*, the *EI Type ITU-X.21 Type*, is available. When *EI Type ITU-X.21* is chosen, the following screen appears

```
Lucent Technologies   DACS II AX - Octal High Speed   Slot:02   Help = [?]  
  
                        Port Configuration  
                        -----  
  
Port Number.....: 1  
Name.....: Eng Lab  
Status.....: In Service  
Mode.....: DS0-A (9.6K)  
Type.....: ITU-X.21  
Data.....: Normal  
Clock.....: Normal  
V.54 Network Loop...: Enable  
Timing.....: Int  
Indication.....: Force Off
```

Figure 19-19. Port 1 configured for ITU-X.21

The ITU-X.21 EI Type option is significantly different from other protocols. Selecting this option forces DS0-A (9.6K) or NxDS0 to appear on the screen, thus removing the DCD, DSR, CTS and DTE options, and replacing them with the Indication option.

3. Press **X** to save the port configuration.
4. Press **Y** to update your configuration and return to the *Port Configuration* submenu or press **N** to cancel changes and return to the *Port Configuration* submenu.

Port Configuration Field Descriptions

Port Number: The port to be configured.

Name: (*text field*) This is a user-defined field. Any name up to 20 alphanumeric characters in length can be entered to identify each port on the OHSD module. You may find it beneficial to use circuit numbers to name the ports.

Port Status: (*option field*) This field displays the status of the port. The status will either be *In Service* (port is active), *Out Of Service* (port is inactive), or *NoConn* (no connection). If there is no connection on the port you will need to define a map. Refer to Chapter 4 for specifics on configuring a map connection.

Mode: (*option field*) This field displays the operational data rate mode of the port. The data rate can be *NxDS0*, *DS0-A (9.6K)*, *NxDS0 Special* or *DS0-A Special*.

NxDS0: Supports any data rate from 48K to 2048K.

DS0-A (9.6K): Supports DS0-A subrate traffic, specifically 9.6K.

NxDS0 Special: Supports any data rate from 48K to 2048K. When using the Special operating mode, this mode allows for local and remote loopback commands to be issued via the DTE interface.

DS0-A Special: Supports DS0-A subrate traffic, specifically 9.6K. When using the Special operating mode, this mode allows for local and remote loopback commands to be issued via the DTE interface.



NOTE:

NxDS0 and NxDS0 Special operating modes are recommended selections since they allow for a variety of speeds.

Type: (*option field*) This field displays which protocol is being supported. The Electrical Interface (EI) Type will either be *EIA-232*, *EIA-530*, *EIA-530A*, *EIA-422*, *ITU-V.35* or *ITU-X.21*.

Indication: (*option field*) This field is only displayed when the *EI Type* selected is *ITU-X.21*. The choices are *Force Off*, *Force On* or *Track Control*.

Data: (*option field*) This field displays the data polarity of the port. The data will either be *Normal* or *Invert*. This field applies to both the transmit or receive data paths.

Clock: (*option field*) This field displays the active edge of the receive clock. The option will either be *Normal* or *Invert*. Initially choose *Normal*. If frequent errors occur at the port, try *Inverted* and check performance.

V.54 Network Loop: (*option field*) Enables the port to respond to V.54 loop codes. The option will either be *Disable* or *Enable*.

Timing: (*option field*) This field displays the timing of the port. The option will either be *Internal*, *External* or *Internal/External*.

DCD: (*option field*) Data Carrier Detect can either be *Force On*, *Track RTS* or *Force Off*. DCD is not applicable for ITU-X.21.

DSR: (*option field*) Data Set Ready can either be *Force On*, *Track DTR* or *Force Off*. DSR is not applicable for ITU-X.21.

CTS: (*option field*) Clear To Send can either be *Force Off*, *Force On* or *Track RTS*.

DTE (LL/RL) Loop: (*option field*) Data Terminal Equipment can either be *Enabled* or *Disabled*. By choosing *Enable*, local and remote loopback commands can be issued via a DTE interface.

Diagnostics Menu

From this menu, you can view and perform diagnostics on the Octal High Speed ports.

Set up Diagnostic Tests

To set up Diagnostic Tests:

1. From the *OHSD Main Menu*, place the cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

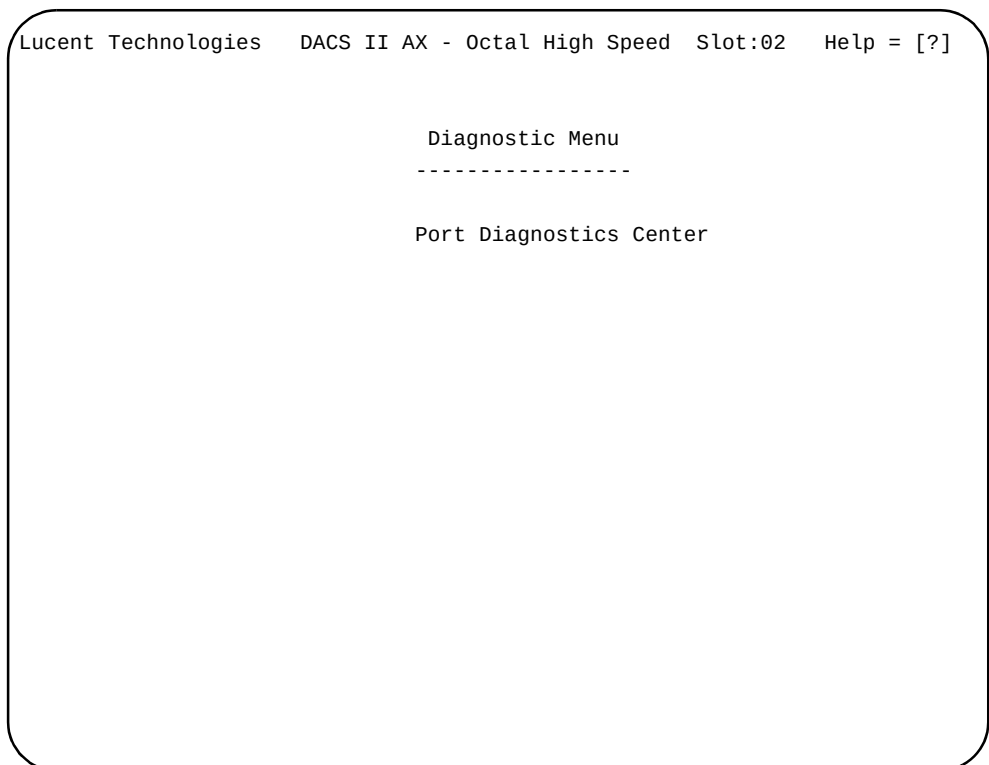


Figure 19-20. Diagnostics Menu

Place your cursor on the *Port Diagnostics Center* field and press **<Enter>**.
The following submenu appears:

Lucent Technologies			DACS II AX - Octal High Speed				Slot:02 Help = [?]		
Diagnostics Manager									

Port	Name	State	Local Loop	Remote Loop	Bkpln Loop	Bert	Test Duration	Local Errors	Remote Errors

1	DS0A Spec	OK	Off	Off	Off	Off	0	0	0
2	DS0A 2 Sp	OK	Off	Off	Off	Off	0	0	0
3	DS0A 9.6	OK	Off	Off	Off	Off	0	0	0
4	DS0A 2 9.	OK	Off	Off	Off	Off	0	0	0
5	NxDS0	OK	Off	Off	Off	Off	0	0	0
6	NxDS0 2	OK	Off	Off	Off	Off	0	0	0
7	NxDS0 Spe	OK	Off	Off	Off	Off	0	0	0
8	NxDS0 2 S	OK	Off	Off	Off	Off	0	0	0
[B]ert [L]oop [E]xpose [C]lear Error Counters [I]nset Error									

Figure 19-21. Diagnostics Manager

The *Diagnostics Manager Menu* allows you to select a *hot key* that will invoke a diagnostic procedure by pressing the corresponding letter, as shown in Figure 19-21.

Port Diagnostics Manager Field Descriptions

Port Name: This field displays the port name entered from the *Configuration Menu* for each port.

State: This field displays the port's current status as *OK* (in service), *Inactive* (out of service) or **ERROR** if there is more than one error.

Local Loop: When local loop is disabled this field will be displayed as *OFF*. When local loop is enabled, this field will display the following indicators:

ON LL - The local loopback command is issued via the DTE Interface.

ON - The local loopback command is issued from the OHSD module.

Remote Loop: When remote loop is disabled this field will be displayed as *OFF*. When remote loop is enabled, this field will display the following indicators:

ON RL - The remote loopback command is issued via the DTE Interface.

On - The remote loopback command is issued from the OHSD module.

Bkpln Loop: A backplane loopback re-directs all the assigned time slots back towards the local DTE after fully transversing the OHSD module set. The indicator for this field will either be *On* or *Off*.

BERT: When BERT is enabled, this field indicates the selected pseudorandom pattern.

Test Duration: Once the BERT test is started, the length of the test is measured in seconds.

Local Errors: Count representing the number of local errored seconds that occurred in a one second period while the OHSD module was in test. Errors are detected on a BERT pattern from an external device connected to a port on the OHSD rear card.

Remote Errors: Count representing the number of remote errored seconds that occurred in a one second period while the OHSD module was in test. Errors are detected on a BERT pattern from devices that interface with the OHSD via the DACS II AX backplane.

**Begin Diagnostics
Test**

To begin a diagnostics test:

**NOTE:**

From the Diagnostics Manager Menu, you may view a local or remote loopback command issued via the DTE interface. The issued command will appear in the Diagnostics Manager Menu as ON LL for Local Loop and ON RL for Remote Loop.

1. Select a *hot key* by pressing the corresponding letter:

[B] = Bert

[L] = Loop

[E] = Expose

[C] = Clear Error Counters

[I] = Insert Error

Additional screens and/or functions are available to begin a diagnostic test. These procedures are detailed on the following pages.

**NOTE:**

If you do not have an active map configured, a "no connection" error message will appear on the screen. To establish a map connection, refer to Chapter 5 of this manual for instructions.

Bit Error Rate Test To perform a BERT:

Place your cursor on an active port in the *Diagnostics Manager* menu and press **B** to select **[B]ert**. The following submenu appears::

```
Lucent Technologies  DACS II AX - Octal High Speed  Slot:02  Help = [?]  
  
          BERT Select  
          -----  
          Port Number...: 1  
          Port Name....: Port Name 1  
          Current BERT.: Off  
          New BERT.....: 2047  
  
Available Bit Error Tests (BERTs)  
-----  
[0]ff  
All- [0]s (0x00)  
All- [1]s (0xFF)  
[2]047 Pattern  
[Q]RSS Pattern  
[5]11 Pattern  
OC[U] Non Latching (Loopback + 2047 Pattern)
```

Figure 19-22. BERT Select Submenu

2. Place the cursor on the *New BERT* field and press **<Enter>**. to toggle between the following options: *Off*, *2047*, *All ones*, *All zeros*, *QRSS*, *511* or *OCU N-L*. These options can be set by pressing the individual keys as shown in the brackets as well.

**NOTE:**

The *OCU N-L* is an OCU Non Latching Loopback + 2047 pattern. This pattern is only visible and valid when the *DS0-A (9.6K)* and *DS0-A Special* modes are selected in the Configuration Menu.

[illegible]

3. Press **Y** to start a new test or press **N** to cancel action and return to the *Bert Select* submenu.

To stop the BERT test:

1. Press **B** and the BERT Select submenu appears.
2. Press **O** to turn off BERT.
3. Press **X** to stop the BERT and return to the Diagnostics Manager menu.

Set Loop Type

To set the Loop Type:

1. Place your cursor on an active port in the *Diagnostics Manager* menu and press **L** to select [L]oop. The following screen appears:

```

Lucent Technologies      DACS II AX - Octal High Speed      Slot:02      Help = [?]

                                Loop Select Screen
                                -----
                                Port Number...: 1
                                Port Name.....: Port Name 1
                                Local.....: On
                                Remote V.54...: Off
                                Backplane Loop: Off

Available Loopbacks
-----
[L]ocal On                Local [O]ff
[R]emote V.54 On          Remote V.54  O[f]f
[B]ackplane On            B[a]ckplane Off
  
```

Figure 19-24. Loop Select Screen

The current loop settings for the port are listed under the screen title, Loop Select Screen. To turn on and off loops, cycle through the options or use the hot keys under Available Loopbacks.

2. Press **L** to change the *Local* field to *On* or press **O** to change the *Local* field to *Off*. You can also place the cursor on the *Local* field and press **<Enter>** to toggle between *On* and *Off*.
3. Turn loopbacks on or off.
 - Press **R** to change the *Remote V.54* field to *V.54* or press **f** to change the *Remote V.54* field to *Off*. You can also place the cursor on the *Remote V.54* field and press **<Enter>** to toggle between *V.54* and *Off*.

- Press **B** to change the *Backplane Loop* field to *On*, or press **a** to change the *Backplane Loop* field to *Off*. You can also place the cursor on the *Backplane Loop* field and press **<Enter>** to toggle between *On* and *Off*.

This loopback only affects an existing backplane connection. The loopback will not occur without a defined connection.

4. Press **X** to set the configuration.
 5. Press **Y** to process the loop command and return to the *Diagnostics Manager Menu* or press **N** to cancel action and return to the *Loop Select Screen Submenu*.
-

**Display Port
Status**

To expose the Port Status:

The Expose screen displays the real-time or current status of the OHSD port. The *Port Status* submenu will display different indicators, depending upon the *Mode* and *Type* you select when you configure the port.

1. Place your cursor on an active port in the *Diagnostics Manager* menu and press **E** to select **[E]xpose**.

If your configuration mode is set for *DS0-A (9.6K) Special* or *NxDS0 Special*, then the following screen appears:

```

Lucent Technologies  DACS II AX - Octal High Speed  Slot:02  Help = [?]

                                Port Status
                                -----

Port#: 1      Name: Eng Lab      Type: EIA-530

                                State  Errored Seconds
DSR: Force On      RX FIFO....: OK      0
DCD: Force Off     TX FIFO....: OK      0
TM.: Force Off     CLOCK EDGE.: OK      0
RL.: Off           Total.....:      0
LL.: Off

[C]lear Counters [I]nsert Error

```

Figure 19-25. The Port Status screen displays the DS0-A (9.6) Special or NxDS0 Special Mode

If your configuration mode is set for NxDS0 or DS0-A (9.6K) and an EI Type other than ITU-X.21, then the following screen appears:

```
Lucent Technologies  DACS II AX - Octal High Speed  Slot:02  Help = [?]  
  
                                Port Status  
                                -----  
  
Port#: 5      Name: NxDS0      Type: EIA-530  
  
DSR...: Force Off      RX FIFO....: OK      0  
DCD...: Force Off      TX FIFO....: OK      0  
CTS...: Force Off      CLOCK EDGE.: OK      0  
DTR...: Off            Total.....:          0  
RTS...: Off  
  
[C]lear Counters [I]nsert Error
```

Figure 19-26. The Port Status screen displays the NxDS0 or NxDS0-A (9.6K) mode and an EI type other than ITU-X.21

If your configuration mode is set for NxDS0 or DS0-A (9.6K) and an EI Type of ITU-X.21, then the following screen appears::

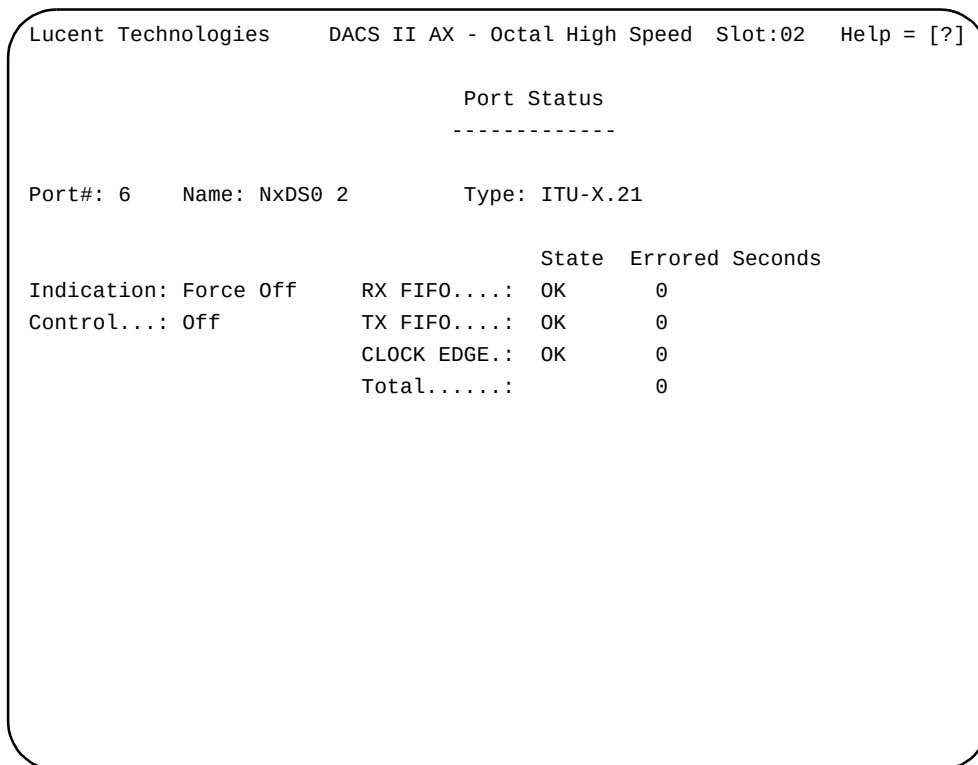


Figure 19-27. The Port Status screen displays the NxDS0 or NxDS0-A (9.6K) mode and an EI Type of ITU-X.21



NOTE:

Once the *Port Status* menu appears, errored seconds are automatically recorded. A BERT pattern must be turned on in order to insert errors. An error-free port will display zeros in all fields.

1. Press **C** to clear counters.
2. Press **I** to insert an error.
3. Press **X** to return to the *Diagnostics Manager Menu*.

**Clear Errored
Seconds and BERT
Indicators**

To clear all errored seconds and BERT indicators:

From the *Diagnostics Manager Menu* press **C** to clear counters; this will reset the errored seconds column to zero. The counter will automatically start again, recording the errors in 5 second intervals.

Insert Error

A BERT pattern must be turned on before you can insert errors.

To insert an error:

1. From the *Diagnostics Manager Menu* press **I** to insert an error. Continuously select **I** to insert an error and the counter will record the errors in a 1 second interval.
 2. Press **X** to return to the *Diagnostics Menu*.
-

Utilities Menu

The Utilities Menu provides access to two submenus from which you can reset the OHSD Module or set its status.

Access Utilities

To access the Utilities:

From the *OHSD Main Menu*, place the cursor on the *Utilities* field and press **<Enter>**. The following menu appears::

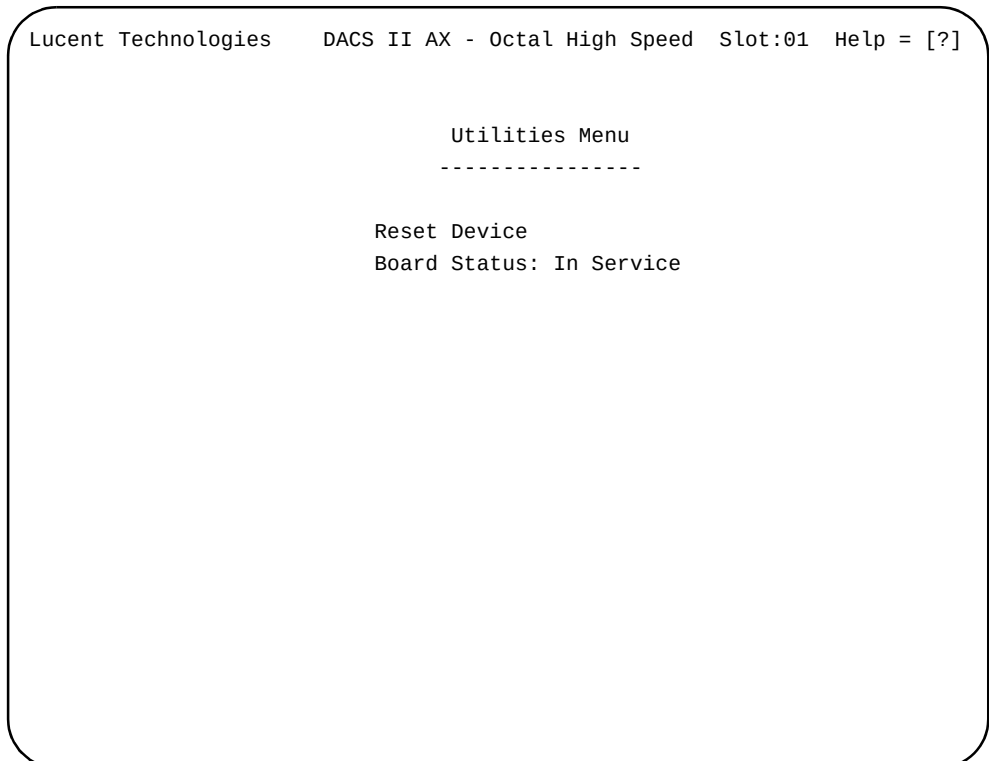


Figure 19-28. Utilities Menu

From the *Utilities Menu*, you can reset the OHSD Module or change its status to *In Service* or *Out of Service*.

Reset Device

**CAUTION:**

Resetting the module will cause a loss of data.

To reset the device:

This utility causes the card to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

1. From the Utilities Menu, place the cursor on the *Reset Device* field and press **<Enter>**. The following screen appears::

```
Lucent Technologies   DACS II AX - Octal High Speed   Slot:01   Help = [?]  
  
                          Utilities Menu  
                        -----  
  
*****  
*                                                                    *  
*                                                                    *  
*                      -MESSAGE! -                                *  
*                                                                    *  
*                                                                    *  
*                      Reset Device?                               *  
*                                                                    *  
*                                                                    *  
*                      Are you sure (Y/N)?                         *  
*                                                                    *  
*****
```

Figure 19-29. Reset Device Screen

2. Press **N** to return to the *Utilities* menu.
3. Press **Y** to Reset Device.

**NOTE:**

If Yes is selected, the card will reset and the front panel LEDs will cascade in sequence. After the card resets, the Node Summary Menu appears. Wait for the **Device State** on the menu to display *On-line* before you proceed.

Procedure - Set Board Status

To set the board status:

From the *OHSD Utilities* menu, place the cursor on the *Board Status: In Service* field and press **<Enter>**. The following screen appears:

```
Lucent Technologies   DACS II AX - Octal High Speed   Slot:01   Help = [?]  
  
                          Utilities Menu  
                        -----  
  
*****  
*                               *  
*               -MESSAGE! -    *  
*                               *  
*                               *  
*   Set device to Out Of Service? *  
*                               *  
*                               *  
*   Are you sure (Y/N)?         *  
*                               *  
*****
```

Figure 19-30. Out Of Service Screen Board Status

**Change Board
Status to Out of
Service**

To change the Board Status to Out Of Service:

1. Press **Y** to change Board Status to *Out Of Service*, or press **N** to return to the *Utilities* menu.

**NOTE:**

If Yes is selected, the Board Status will read Out Of Service in the Utilities Menu. All of the front panel LEDs will blink yellow.

**Change Board
Status to In Service**

To change the Board Status to In Service:

Place your cursor on the *Board Status - Out Of Service* field and press **<Enter>**. The following screen appears::

Lucent Technologies DACS II AX - Octal High Speed Slot:01 Help = [?]

Utilities Menu

```
*****
*                                                                              *
*                                -MESSAGE! -                                *
*                                                                              *
*                                                                              *
* Set device to In Service?  **Device Will Reset**  *
*                                                                              *
*                                                                              *
*                                Are you sure (Y/N)?                            *
*                                                                              *
*****
```

Figure 19-31. Reset In Service Screen

2. Press **Y** to reset Board Status to *In Service*, or press **N** to return to the *Utilities* menu.

**NOTE:**

After pressing any key, all LEDs illuminate. It takes approximately 10-20 seconds for the OHSD board to reset. The Node Summary Menu appears with a configuration status of *On-line* then all LEDs will cascade down the front panel of the application module to indicate the OHSD board has reset.

About Menu

The About menu displays information about the software release and version, and details about the Interface Module.

Procedure

To display identification information:

From the *OHSD Main Menu*, place the cursor on the *About* field and press **<Enter>**. The following screen appears::

```
Lucent Technologies  DACS II AX - Octal High Speed  Slot:02  Help = [?]  
  
                          About  
                          -----  
  
Version.....: 02.02  
Release Date....: May 10, 2000  
Checksum.....: 70B3  
Xilinx Version...: ds0a_r4  
Front Card Type..: Octal High Speed  
Front Card Rev...: 0  
Rear Card Type...: Octal High Speed  
Rear Card Rev....: 0
```

Figure 19-32. Octal High Speed Data About Screen

About Field Descriptions

Version: Displays the software version currently in the OHSD's flash memory.

Release Date: Displays the date of module software release.

Checksum: Displays the sum of all bytes in the OHSD's flash memory at power up.

XILINX Version: Displays the hardware version of downloadable, programmable devices.

Front Card Type: Displays the type of board in the system.

Front Card Rev: Displays the board's revision level.

Rear Card Type: Displays the type of board in the system.

Rear Card Rev: Displays the board's revision level.

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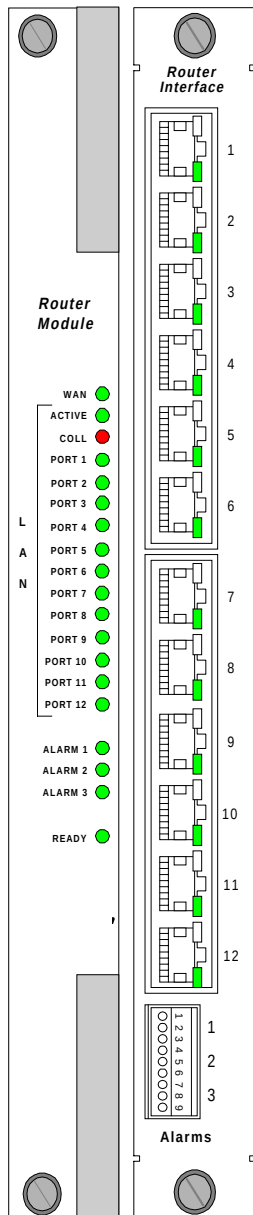
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Physical Description



The Channelized Router Hub allows the DACS II AX to perform the functions of a channelized, multiprotocol router. It is designed to provide simultaneous support for TCP/IP, IPX, PPP, PPP/LAPB, RIP, RIP 2, OSPF, SAP, Multilink, Mutilink/LAPB, and Frame Relay protocols.

The module set assembly comprises two circuit card modules: the Router Application Module or front card that contains backplane, switching, and framing logic, and the Interface Module or rear card that provides hub functionality via twelve 10BaseT ports.

There are 19 LEDs on the front card, a set of twelve for the LAN ports, three alarm LEDs, three LEDs that provide LAN/WAN status, and a READY LED. There is also a green LED near each connector on the Interface Module which indicates LAN activity.

- **WAN** - green indicates that WAN status is OK, red indicates a problem with the WAN connection.
- **ACTIVE** - green indicates activity is present on the LAN.
- **COLL** - red indicates that a collision has taken place on the LAN.
- **PORT (1-12)** - green indicates a LAN connection is present on the port.
- **ALARM (1, 2, 3)** - indicates alarm conditions in remote equipment. Green indicates that the remote device is connected and not in an alarm state; red indicates that the remote device is in an alarm state or has been disconnected. When the LED is not lit, no connection has been configured for the circuit.
- **READY** - green indicates that the module is powered up and connected to the bus, while red indicates there is a problem with the module.

Thumb screws are provided at the top and bottom of the bezels to secure them in the chassis and to make an electrical connection to frame ground for regulatory emissions compliance. The electrical connection to frame ground also protects the modules from static discharge.

NOTE:
The N + 1 Protection Switch does not supply redundancy for the Router module set.

Regulatory Information

FCC Information

The Channelized Router Hub complies with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the Interface Module must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

Product Safety

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

Europe

This equipment is in conformity with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

Follows the provisions of the EMC directive 89/336/EEC, and the Low voltage directive 73/23/EEC.

Before You Begin

- This chapter is written for ADMINISTRATOR-level users.
 - In order to view the menus associated with the Channelized Router Hub, a slot must be configured for the module type and the Channelized Router Hub must be resident in a slot in the equipment chassis. (A Router Interface Module must also be resident in the same numbered slot as the Router Application Module.) If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4 of this manual.
 - Screens are shown for a DACS II AX with the SMC II module. Although this Channelized Router Hub is also supported by SMC I, there will be some screen differences, mainly involving the Slot Configuration Menu, Slot Configuration Submenu, and Node Summary Menu, as well as anything to do with N+1 Redundancy.
 - N+1 Redundancy is not available for use with the Channelized Router Hub.
 - The Channelized Router Hub is also referred to in this text as the Router Module.
-

Slot Configuration

To configure a slot for the Router Module:

1. From the *DACS II AX Main Menu*, move your cursor to the *System Configuration* field and press **<Enter>**. The following menu appears:

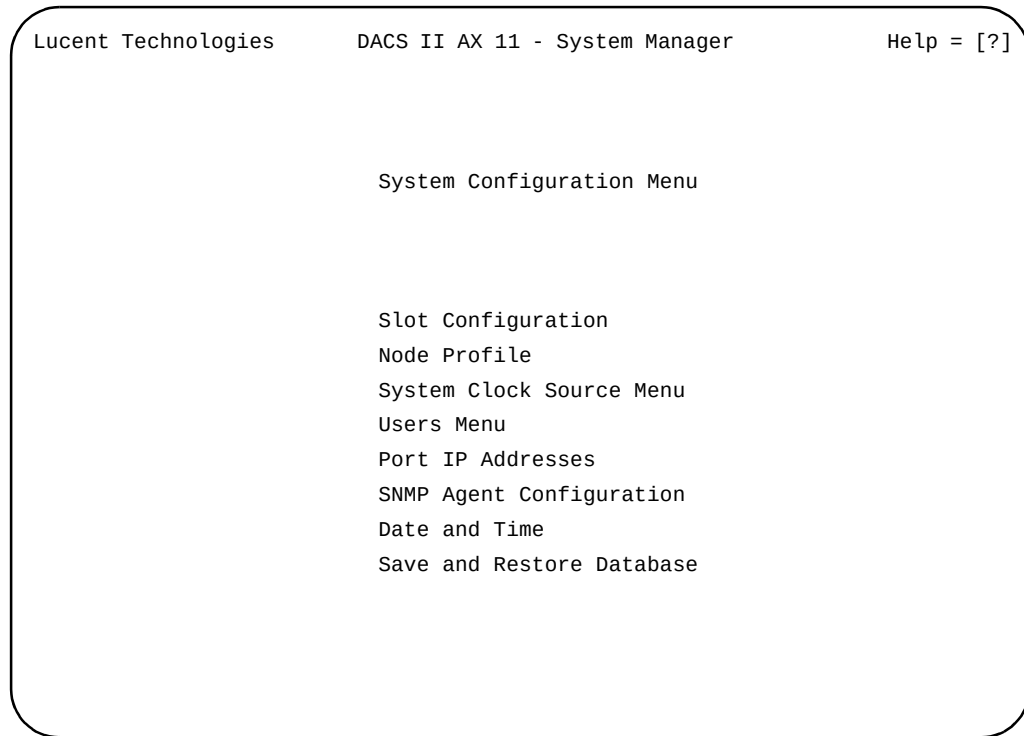


Figure 20-1. System Configuration Menu

2. Then place your cursor on the *Slot Configuration* field and press **<Enter>**. The following menu appears, displaying slots numbered from 1 to 4 (DACS II AX-4) or from 1 to 11 (DACS II AX-11):

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
                          Slot Configuration Menu

      Slot#  Device Type      Name      Redundancy
      ----  -
      1      Octal T1/E1      Standby Lnk  Enable
      2      Octal T1/E1      Data Loop 1  Enable
      3      Octal T1/E1      Data Loop 2  Enable
      4      Octal T1/E1      Data Loop 3  Enable
      5      Octal T1/E1      Data Loop 4  Enable
      6      Octal T1/E1      Data Loop 5  Enable
      7      Quad T1          T1           Disable
      8      Quad OCU         OCU          Disable
      9      Router           Router        Disable
      10     T3               T3 Link      Enable
      11     T3               T3 Standby   Enable

      N+1 Redundancy:          Enable
      N+1 Redundancy Switchover: Automatic
      N+1 Redundancy Restore:   Manual
      Change Card = [Enter key]  [D]elete Card
  
```

Figure 20-2. Slot Configuration Menu

3. Move your cursor to the slot number where the Router Module will reside, and press **<Enter>**. The following submenu appears:

```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]  
  
Slot Configuration  
  
Slot name: Router  
Card type: Router  
Redundancy: Disable
```

Figure 20-3. Slot Configuration Submenu

4. Place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number of up to 11 alphanumeric characters and press **<Enter>** again.
5. Move your cursor to the *Card Type* field and scroll through the card types by pressing the **<Enter>** key until *Router* is displayed.

N+1 Redundancy may appear on this submenu, but is NOT available for use with the Channelized Router Hub. Enabling Redundancy for this module will have no effect.
6. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.



NOTE:

The same procedure applies when replacing an existing card in a slot.

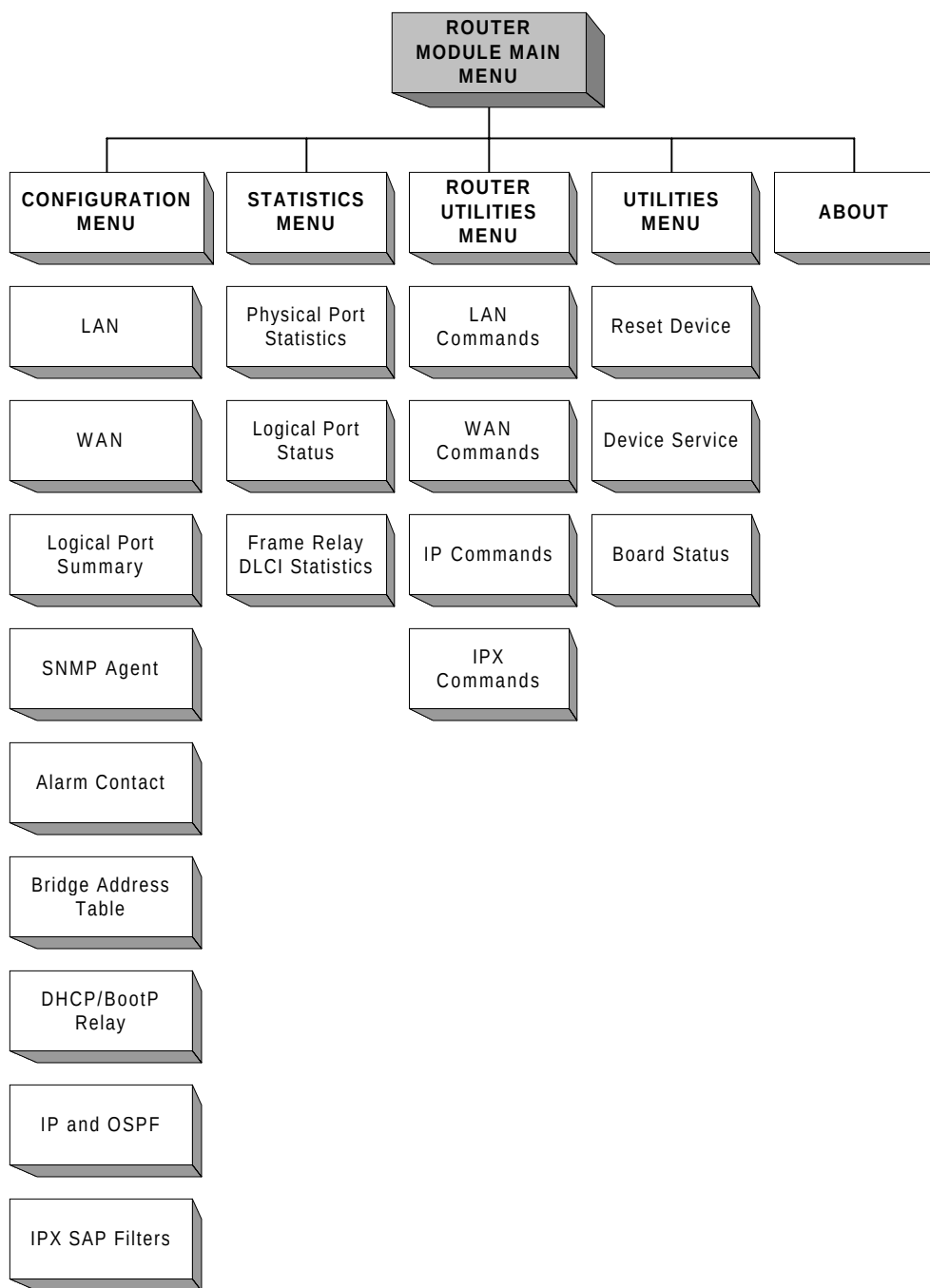
**Delete Slot
Configuration**

If you opt to delete a card, remove the card from the slot first. Then press **D** and a message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to discontinue.

If you do not remove the card prior to pressing **D**, the following message appears:
"-ALERT- Can not delete a device that is present."

Main Menu

The Channelized Router Hub's *Main Menu* is accessed from the *Node Summary Menu*. The menu structure is shown in Figure 20-4.

**Figure 20-4. Menu Structure**

**Access Router
Module Main
Menu**

To access the Router Module Main Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*.

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
Databases: InSync           N+1 Redundancy State: Enabled
Alarm Contacts...: Enabled

                                Node Summary Menu

Slot#   Configured Type   Device State   Alarm
-----
01      Octal T1/E1       Standby        None
02      Octal T1/E1       Online         None
03      Octal T1/E1       Online         None
04      Octal T1/E1       Online         None
05      Octal T1/E1       Online         None
06      Octal T1/E1       Online         None
07      Quad T1           Online         None
08      Quad OCU          Online         None
09      Router            Online         None
10      T3                Online         None      Clock Source
11      T3                Standby        None
SMCA    System Manager A  Online         None
SMCB    System Manager B  Standby        None
PSX     ProtectionSwitch  Online         None

[C]lear error counts  [S]lot Cfg      [E]xpose      [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver  [R]estore

```

Figure 20-5. Node Summary Menu

2. Place your cursor on the slot number where the Router Module is located and press **<Enter>**. The Router Module's *Main Menu* appears.

**NOTE:**

On the Node Summary Menu, the Configured Type must display Router and the Device State must display "On-line" in order to access the Router Module's Main Menu. If the Device State is "Off-line," an alert message is generated.

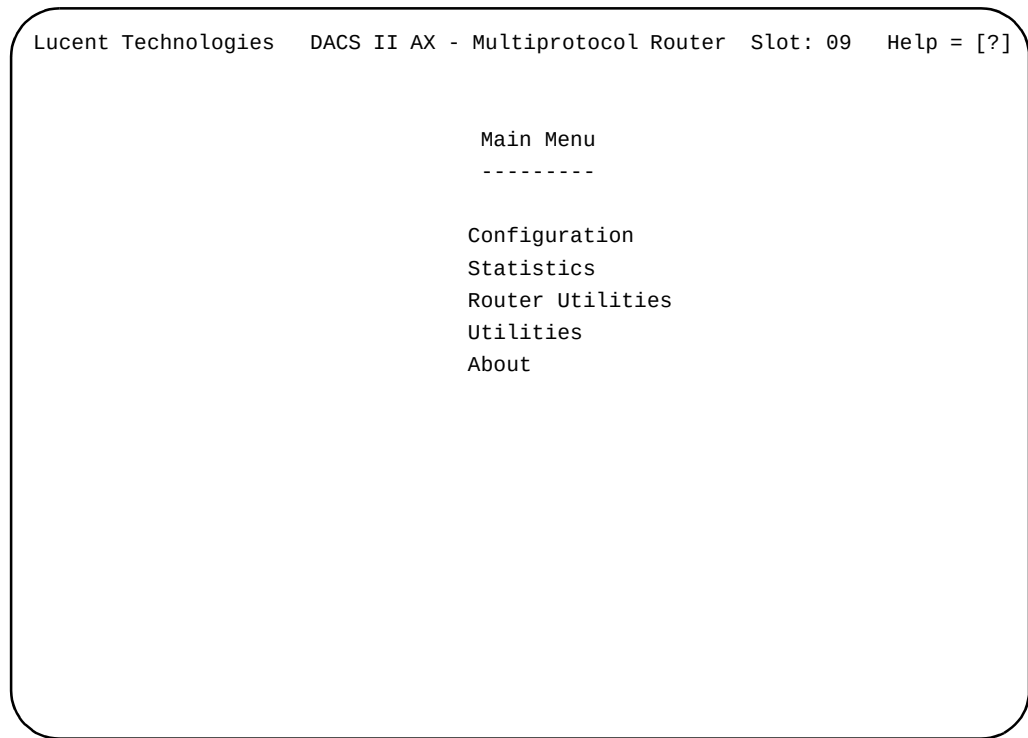


Figure 20-6. Router Main Menu

From the *Main Menu* you can configure the Channelized Router Hub, view statistics, access utilities, and display module identification (software and hardware revision levels).

Configuration Menu

The Configuration Menu provides access to nine submenus. From these submenus, you can view and change all Channelized Router Hub configuration parameters. The Configuration Menu structure is shown in Figure 20-7.

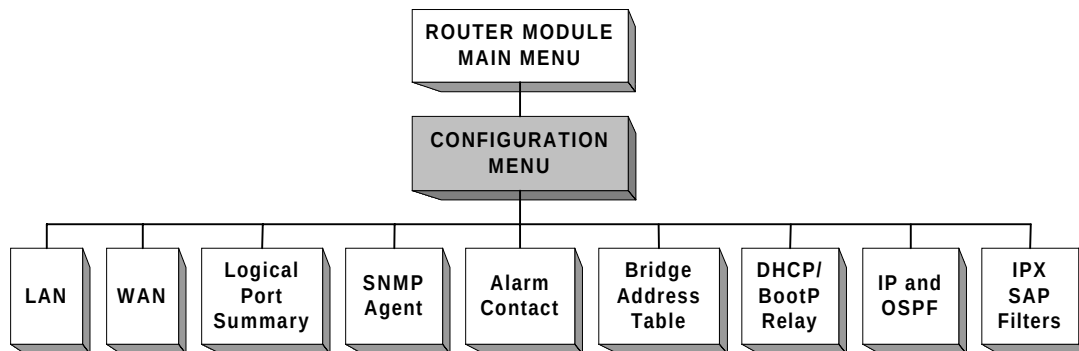


Figure 20-7. Configuration Menu Structure

Router Module Configuration

Procedure

To configure the Router Module:

1. From the *Main Menu*, place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

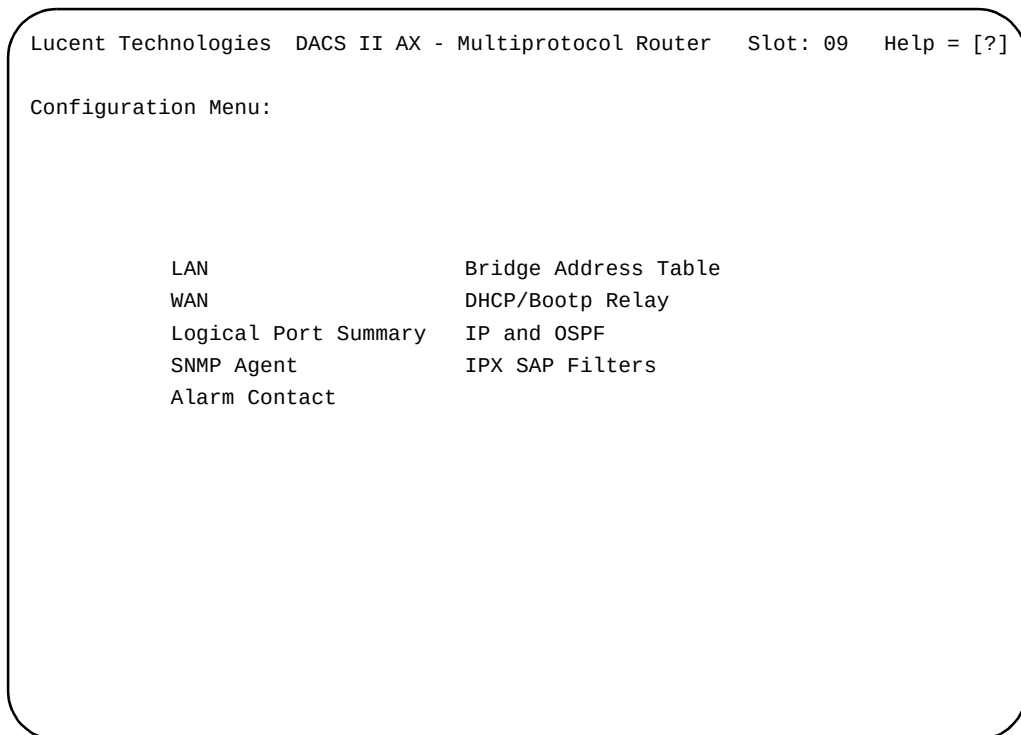


Figure 20-8. Configuration Menu

2. Use the following procedures to configure the Router Module.

LAN Port Configuration

A LAN interface that carries IP or IPX traffic contains an LLC (Logical Link Control) layer in addition to the MAC header. This information is used to identify the upper layer protocol encapsulated in a packet. These parameters must be configured for routing applications only, and are irrelevant in bridging applications. Since the Router Module also provides hub functionality, this procedure is used to configure all twelve of the 10Base-T connectors located on the Interface Module.

Procedure

To configure the LAN Port:

1. From the *Configuration Menu*, place your cursor on the *LAN* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies   DACS II AX - Multiprotocol Router   Slot: 09   Help = [?]  
  
LAN configuration menu...  
  
LAN port configuration           Spanning tree configuration  
-----  
IP encapsulation...: Ethernet II   Bridge priority....: 32768  
IPX encapsulation...: Novell 802.3  
IPX network segment: 01100001  
  
Detected Encapsulations         Detected Protocols  
-----  
IP encapsulation...: Ethernet II   IP.....: Yes  
IPX encapsulation...: Novell 802.2 ARP.....: Yes  
                               IPX.....: Yes  
                               Spanning Tree.....: No
```

Figure 20-9. LAN Configuration Submenu

2. Configure LAN parameters from here. Refer to the field descriptions on the following pages.
3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the Configuration Menu.

LAN Configuration Field Descriptions

IP Encapsulation: (*option field*) Ethernet LANs use two types of IP frame encapsulation. The encapsulation should match other IP workstations and hosts on the LAN. The choices are *Ethernet II* or *802.3*.

IPX Encapsulation: (*option field*) There are four types of IPX frame encapsulation: *Novell 802.2*, *Ethernet II*, *Novell 802.3* or *SNAP* (Subnet Access Protocol). The encapsulation should match other IPX workstations and hosts on the LAN.

IPX Network Segment: (*text field*) Every LAN segment that carries IPX traffic must be assigned a unique network segment number for routing purposes. This ($\leq$) eight-character hexadecimal number determines the network segment to which this node will be attached. It must be programmed if you are using IPX routing. The IPX routing protocol uses this number to determine the route necessary to forward packets of data to specific WAN interfaces.



NOTE:

The network segment number (or network address number, as it is known by NetWare) is assigned by a network administrator when the file server is installed. If you are installing a network for the first time, each segment must have a unique address. When assigning arbitrary addresses, you must ensure that the address you choose is not assigned anywhere else on the network. Contact the network administrator to obtain the network segment number.

Spanning Tree Configuration: The Spanning Tree Configuration applies to bridging applications only. The Router Module's bridge software uses the IEEE 802.1d spanning tree protocol. Only the bridge priority parameter is configurable; the bridge automatically sets all other spanning tree values.

Bridge Priority: (*text field*) The bridge priority value ranges from 0 to 65535, where 0 is the highest priority. The spanning tree algorithm to determine the root of the interconnected network uses this parameter. The spanning tree protocol will automatically create a loop-free network topology for bridging, even if the bridge priority is kept at its default value. By changing the priority, you can change the topology of the spanning tree. The default setting is 32768.

Detected Encapsulations and Detected Protocols

These fields are read-only. They tell you if the LAN port is "seeing" packets (e.g., cable attached properly, etc.) and also displays the encapsulation used on the network.

IP Encapsulation: This field indicates the type of IP encapsulation that has been detected on the LAN. There are two types of IP frame encapsulation that can be detected: *Novell 802.3* or *Ethernet II*.

IPX Encapsulation: This field indicates the type of IPX encapsulation that has been detected on the LAN. There are four types of IPX frame encapsulation that can be detected: *Novell 802.2*, *Ethernet II*, *Novell 802.3* or *SNAP* (Subnet Access Protocol).

IP: Yes indicates that IP Protocol has been detected.

ARP: Yes indicates that Address Resolution Protocol has been detected.

IPX: Yes indicates that IPX Protocol has been detected.

Spanning Tree: Yes indicates that Spanning Tree Protocol has been detected.

WAN Port Configuration

WAN ports for the Channelized Router Hub are not connected the same as a typical WAN interface, but are routed indirectly via the DACS II AX backplane. From the DACS II AX backplane, another module (such as the Octal T1/E1) is used to physically connect to the WAN.

Procedure

To configure the WAN Ports:

1. From the *Configuration Menu*, place your cursor on the *WAN* field and press **<Enter>**. The following submenu appears:

```

Lucent Technologies  DACS II AX - Multiprotocol Router  Slot: 09  Help = [?]

WAN configuration...

                                Time Slot Allocation

TS  Interface      TS  Interface      TS  Interface      TS  Interface
--  -
01  WAN 1          09  WAN 9          17  WAN 17         25  WAN 25
02  WAN 2          10  WAN 10         18  WAN 18         26  WAN 26
03  WAN 3          11  WAN 11         19  WAN 19         27  WAN 27
04  WAN 4          12  WAN 12         20  WAN 20         28  WAN 28
05  WAN 5          13  WAN 13         21  WAN 21         29  WAN 29
06  WAN 6          14  WAN 14         22  WAN 22         30  WAN 30
07  WAN 7          15  WAN 15         23  WAN 23         31  WAN 31
08  WAN 8          16  WAN 16         24  WAN 24         32  WAN 32

Configure interface = [C]

```

Figure 20-10. WAN Configuration Submenu (Time Slot Allocation)

2. The following rules apply when configuring the WAN ports:
 - Up to 32 virtual WAN ports can be configured using timeslots 01 through 32.
 - WAN 1 is the ONLY port that can be configured for Frame Relay.

3. Before you continue, you must determine the size of each virtual WAN port and allocate the proper amount of bandwidth (number of timeslots) for each port. Example: You can set WAN 1 to consist of timeslots 01 through 04, WAN-2 to consist of timeslots 5 and 6, etc. Each timeslot has a maximum bandwidth of 64 kbps, so in this case WAN 1 will have a maximum bandwidth of 256 kbps, WAN 2 will have a maximum bandwidth of 128 kbps, etc.

**NOTE:**

If you are not currently using Frame Relay but intend to utilize it in the future, it is suggested that you reserve WAN 1 for future Frame Relay support provided enough timeslots are available to do so. Timeslot mapping must match the connection maps (refer to Chapter 5).

4. Move your cursor to each timeslot and press **<Enter>** to select the virtual WAN port for the timeslot.
5. To configure a virtual WAN port, move your cursor to the timeslot that you wish to configure and press **C**. If you are configuring WAN 1, the following submenu appears:

```
Lucent Technologies   DACS II AX - Multiprotocol Router Slot: 09   Help = [?]

WAN virtual port configuration menu...

Virtual port.....: WAN 1

Enabled.....: Enabled           Port id.....:
DS0 Mode.....: Nx56             Multilink bundle id.: 0
Protocol.....: PPP

Frame relay parameters...      Authentication parameters...

Management.....: ANSI T1.617D   User Name.....: none
User/Network side.: User         Password/secret: none
Full status..(N391): 6           Authentication required: No
Threshold....(N392): 3           Authentication protocol: CHAP
Events.....(N393): 4
Integrity....(T391): 10
Verification.(T392): 15         Multicast DLCI: 0
```

Figure 20-11. WAN Virtual Port Configuration Submenu (WAN 1)

This submenu allows Frame Relay parameters to be configured.

6. If you are configuring WAN 2-32, the following submenu appears when **C** is pressed:

```
Lucent Technologies  DACS II AX - Multiprotocol Router  Slot: 09  Help = [?]

WAN virtual port configuration menu...

Virtual port.....: WAN 2

Enabled.....: Enabled      Port id.....:
DS0 Mode.....: Nx56         Multilink bundle id.: 0
Protocol.....: PPP

Authentication parameters...

Name.....: none
Password/secret: none
Authentication required: No
Authentication protocol: CHAP
```

Figure 20-12. WAN Virtual Port Configuration Submenu (WAN 2-32)

This submenu does NOT allow Frame Relay configuration.

7. From either WAN Virtual Port Configuration submenu (as applicable), configure the virtual WAN port. Each virtual WAN port only needs to be configured once, no matter how many timeslots it occupies. Refer to the field descriptions on the following pages for more information.



NOTE:

Configured connections also must match the connections that were configured in the DACS II AX connection map. Refer to Chapter 5 for more information on Connection Mapping

8. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *WAN Configuration* submenu.

9. Configure another virtual port, or when all ports are configured, press **X** to save changes and return to the *Configuration Menu*.

WAN Configuration Field Descriptions

Enabled: (*option field*) This parameter enables or disables the WAN interface. *Enabled* means that the interface is operational. If the network to which the connection is attached to goes down, the front panel alarm indicator (ALM) will illuminate. *Disabled* means that the interface is not operational. Even if you have mapped the WAN connection to your Router Module, the WAN connection will not be operational if this parameter is set to *Disabled*. *Enabled* is the default setting.

DS0 Mode: (*option field*) Select either *Nx56* (7 bit) or *Nx64* (8 bit) density. Use *Nx56* if you need to ensure one's density in the network, typically this would only be a problem when utilizing an AMI link.

Protocol: (*option field*) This parameter lets you define the protocol to be used on the WAN connection. *PPP* is the default setting.



NOTE:

The Frame Relay parameters at the bottom of the screen are only valid when Frame Relay is selected, and should remain in their default states when another protocol is used.

The available protocols are:

- **PPP** - Point-to-Point Protocol establishes a connection using parameters defined in RFC 1548.
- **Multilink** - Multilink, as defined in RFC 1717, establishes a PPP connection using multiple WANs as a single aggregate. Each WAN is assigned to a group or "bundle" using the *Multilink Bundle id* field.
- **PPP/LAPB** - This protocol establishes a point-to-point connection over LAPB (Link Access Protocol, Balanced) as defined in X.25 Level 2.
- **Multi-link/LAPB** - This protocol establishes a multilink point-to-point connection over LAPB protocol.
- **Frame Relay** - This protocol establishes a connection using Frame Relay services. Frame Relay is a multiplexing protocol designed to operate over transmission facilities that are essentially error-free. Frame Relay services combine the bandwidth efficiency of packet switching with increased speed and performance.



NOTE:

Only WAN 1 can be configured with Frame Relay protocol.

**WAN
Configuration
Field Descriptions
(Continued)**

Port id: (*text field*) This field can be used to enter port identification information, and can contain up to 19 alphanumeric characters.

Multilink Bundle id: (*option field*) Identifies the links that are bundled together when Multilink protocol is enabled. Any bundle number can be selected from 0 - 15.

Frame Relay Parameters (WAN 1 only)

Management: (*option field*) Frame Relay options accommodate four different management schemes:

- ANSI T1.617D
- CCITT Q.933A
- LMI (Local Management Interface)
- None

Choose the option that your service provider specifies. For example, select *None* for applications where two units are connected end-to-end and no public Frame Relay switch is in the network between the local and remote sites. If *None* is selected, all other frame relay parameters are irrelevant. *ANSI T1.617D* is the default setting.

User/Network Side: (*option field*) If you are connected to a carrier with a switch, this parameter should be set to *User*. *Network* should be selected only for point-to-point applications or test purposes. If you select *Network* at one end, the other end must be set to *User*. The network side will act as a switch to the user side. *User* is the default setting.

Full Status (N391): (*option field*) This field sets the frequency at which the system requests full status information. The *Full Status* frequency is relative to the number of requests for regular status. The range is from 1 to 255. The default setting is 6, which means that one of every six status requests will be a request for full status. This parameter is only applicable when the User/Network parameter is set to *User*.

Threshold (N392): (*option field*) This field sets the number of Local In-channel signaling link reliability or protocol errors that can occur during a sliding monitored events count before a channel or frame relay user device is declared inactive. The range is from 1 to 10. The *Threshold* value must be less than the value of the *Events* parameter. The default setting is 3.

**WAN
Configuration
Field Descriptions
(Continued)**

Events (N393): *(option field)* This field sets the size of the sliding window used by the network to determine whether a channel or user device is active. After a channel or user device is declared inactive, the network will wait a specified number of poll cycles before declaring the channel or user device active again. The range is from *1* to *10* and must always be greater than the value of the *Threshold* parameter. The default setting is *4*.

Integrity (T391): *(option field)* This field sets the frequency at which the network is polled for status. The selection range is from *5* to *30* seconds. A value of *10* means the network will be polled every *10* seconds. This parameter is only applicable when the User/Network parameter is set to *User*. The default setting is *10*.

Verification (T392): *(option field)* This field sets the network's timer for verifying the polling cycle. The selection range is from *5* to *30* seconds. It is considered an error if a poll is not received from the your end within the specified time. This setting should always be greater than the *Integrity* setting and is only applicable to the "network" side. The default setting is *15*.

Authentication Parameters

Used where increased security is required, authentication parameters ensure that the person requesting access to the network is a valid client. The name and password parameters must be the same at each end. Authentication parameters can be used only with PPP.

User Name: *(text field)* This field can be used to enter a user name, and can contain up to 19 alphanumeric characters.

Password/secret: *(text field)* This field can be used to enter a password, and can contain up to 19 alphanumeric characters.

Authentication required: *(option field)* If this parameter is set to *Yes*, the Router Module will use authentication protocol to verify that the person requesting access to the network has been given valid access. The Router module will ensure that the proper name and password have been entered. If the name and password do not match that which has been programmed, access to the network will be denied. If authentication is not required (parameter set to *No*), the Router Module will not check names and passwords.

**WAN
Configuration
Field Descriptions
(Continued)**

Authentication protocol: *(option field)* There are two types of authentication protocol as defined by RFC1334: *PAP* (Password Authentication Protocol) and *CHAP* (Challenge Handshake Authentication Protocol).

- **PAP** is the most basic form of authentication. With *PAP*, a user's name and password are transmitted over a network and compared to a table of name-password pairs. Typically, the passwords stored in the table are encrypted.
- **CHAP** is a type of authentication in which the authentication agent sends the client program a key to be used to encrypt the username and password. *CHAP* not only requires the client to authenticate itself at startup time, but sends challenges at regular intervals to make sure the client hasn't been replaced by an intruder, for instance by switching phone lines.

It is recommended to use the same protocol at both ends, but it is not necessary to do so.

Multicast DLCI: *(option field)* (Applies only when WAN 1 is configured for Frame Relay.) This field is for bridging on Frame Relay networks that provide a multicast DLCI. Options are from 16 to 1023 and 0. When this field is set to a DLCI number other than 0, all broadcast and unknown destination address frames are sent on this DLCI instead of being broadcast by all of the DLCIs on the interface. If the field is set to 0, the multicast DLCI feature is disabled on this interface. The default setting is 0.

Logical Port Configuration

The parameters for each logical port for the Router Module can be configured utilizing the *Logical Port Summary* submenu and the *Logical Port Parameters* submenu. Among those items that can be configured are logical port parameters, protocols, and IP parameters.

Procedure

To configure a Logical Port:

1. From the *Configuration Menu*, place your cursor on the *Logical Port Summary* field and press **<Enter>**. The following submenu appears:

Lucent Technologies		DACS II AX - Multiprotocol Router		Slot: 09	Help = [?]
Logical port summary menu...			Page 1 of 5		
Port	DLCI	BSIXC	Port	DLCI	BSIXC
LAN		--I--	WAN 16	16	--I--
WAN 1	16	--IX-	WAN 17	16	--I--
WAN 2	16	--I--	WAN 18	16	--I--
WAN 3	16	--I--	WAN 19	16	--I--
WAN 4	16	--I--	WAN 20	16	--I--
WAN 5	16	--I--	WAN 21	16	--I--
WAN 6	16	--I--	WAN 22	16	--I--
WAN 7	16	--I--	WAN 23	16	--I--
WAN 8	16	--I--	WAN 24	16	--I--
WAN 9	16	--I--	n/a		-----
WAN 10	16	--I--	n/a		-----
WAN 11	16	--I--	n/a		-----
WAN 12	16	--I--	n/a		-----
WAN 13	16	--I--	n/a		-----
WAN 14	16	--I--	n/a		-----
WAN 15	16	--I--	n/a		-----
			Page next/prev = ['+'/'-']		

Figure 20-13. Logical Port Summary Submenu

2. From the *Logical Port Summary* submenu, position your cursor on the port entry field that you wish to configure and press **<Enter>**. The following submenu will appear.

```
Lucent Technologies      DACS II AX - Multiprotocol Router      Slot: 09      Help = [?]  
  
Logical port configuration menu...  
  
Logical port parameters  
-----  
Port type.....: WAN 1          Protocol: Frame Relay  
Frame Relay DLCI.: 0  
  
Protocol enables          IP parameters  
-----  
Bridging.....: Disabled      Port IP address...: 12.0.0.1  
Spanning Tree....: Disabled   Port IP mask.....: 255.0.0.0  
IP.....: Enabled             Remote IP address: 0.0.0.0  
IP RIP.....: Disabled         Cost.....: 0  
OSPF.....: Disabled           Filter.....:  
IPX.....: Disabled           Side (NAT only)...: Outside  
Data Compression.: Disabled  
  
IPX SAP Filter....:
```

Figure 20-14. Logical Port Parameters Submenu

3. Select logical port parameters from here. Refer to the field descriptions on the following pages.
4. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *Logical Port Summary* submenu.

5. Configure another logical port, or when all logical ports are configured, press **X** to save changes. You will exit the *Logical Port Summary* submenu and return to the *Configuration Menu*.

**NOTE:**

In order for your changes to take affect, you must exit completely out of the Logical Port Summary submenu.

**Logical Port
Configuration
Field Descriptions****LOGICAL PORT PARAMETERS**

Port Type: (*option field*) This column specifies the virtual port on which frames are transmitted. It will be *LAN*, *WAN-1*, *WAN-2*, etc.

Frame Relay DLCI: (*option field*) If the WAN protocol selected is Frame Relay, press **<Enter>** until the provider-assigned DLCI number is reached. Options are from *16 -1023* and *0*. If the provided number is passed, use press **B** to toggle backward to the assigned number.

**NOTE:**

If the virtual port is a LAN port, the DLCI number is irrelevant.

PROTOCOL ENABLES

There are seven protocols that can be enabled or disabled on the logical ports. They are as follows:

- Bridging
- Spanning Tree
- IP
- IP RIP
- OSPF
- IPX
- Data Compression

**NOTE:**

IP RIP is enabled here; the default is RIP 1, but can be changed to RIP 2 from the IP and OSPF Configuration Menu.

Major protocols are summarized on the *Logical Port Summary* submenu (*BSIXC* field) as follows:

B	Bridging
S	Spanning Tree
I	IP Routing
X	IPX Routing
C	Data Compression

Protocol: This parameter is a read-only field. It reflects the protocol you selected when configuring the virtual port.

**Logical Port
Configuration
Field Descriptions
(Continued)****IP PARAMETERS**

Port IP Address: *(text field)* This parameter is used to specify the Router Module's port IP address and is not required when bridging. When routing, it is not required on virtual port unless using numbered links.

Port IP Mask: *(text field)* The IP mask used to separate the Host portion from the Network portion, and is represented in a 32-bit number format in the same way as the IP address. A default mask is automatically generated, depending upon the IP address you provide (Class A, B, or C). If the mask value is 0.0.0.0, then it is automatically updated the next time you make a change to the IP address. However, it can be overridden to support subnetting. Subnetting allows you to allocate bits from the host portion of the IP address as an extension to the address. Used to separate the host portion from the network portion of the IP address, the subnet mask can be 24, 16 or 8 bits in length.

Remote IP Address: *(text field)* This parameter is used on WAN ports only when Frame Relay protocol is being used or when unnumbered links are configured and RIP is disabled. It specifies an IP address at the remote end of the Frame Relay connection. When multiple DLCIs are configured for the same network address, the IP router needs to be able to distinguish the far end of each DLCI in order to route properly. If each DLCI is configured with a unique network address, this parameter is not required. Enter an IP address in "dotted decimal notation." If you do not know the address, consult your network administrator.

⇒ NOTE:

If the remote address on a Frame Relay logical port is set to 0.0.0.0, the Router Module will use Inverse ARP (RFC 1293) to find the IP address of the remote end automatically. Inverse ARP is performed periodically to keep the IP route table refreshed. To disable Inverse ARP, enter the correct IP address in the remote IP address field. Inverse ARP applies only to logical links configured for Frame Relay.

Cost: *(text field)* The best path is the one that causes the least delay. If you have a low cost, your link speed is usually fast and your delay is slight. However, if your cost is high, your speed will be slow and you will experience more delay. The range is from 0 to 65535, with a lower number indicating a smaller delay.

⇒ NOTE:

Cost is used only when the OSPF protocol is enabled. It is irrelevant for other protocols.

Filter: This parameter is used to choose an IP filter to associate with the logical port. When filters have been previously configured, and you place your cursor on this field and press **<Enter>**, the following submenu appears:

```
Lucent Technologies  DACS II AX - Multiprotocol Router  Slot: 09  Help = [?]

Filter selection menu...                               Page 1 of 1

Selected filter:
Filter name      Comment
Server 1        LAB server
Server 2        Engineering Server

Page up/down =    ['+'/'-']
Erase selection =  ['e'/'E']
```

Figure 20-15. Filter Selection Submenu

This submenu will appear only when filters have been previously configured.



NOTE:

The IP filtering feature is a powerful one, and thus should be invoked with care. It is necessary to have detailed knowledge of networking protocols in order to set up a useful filter. For instructions on how to configure filters, refer to the IP and OSPF Configuration section.

Side (NAT only): (*option field*) This parameter is used to translate private addresses on an internal network into globally-known addresses prior to forwarding packets onto another network. There are two port choices, *Inside* or *Outside*. Set the port to *Inside* if the port is directly connected to a network using local addresses (e.g., the LAN port is an Inside port). Set to *Outside* port if the port is directly connected to devices using global addresses (e.g., the WAN ports are Outside ports).

**NOTE:**

The IP address assigned to this port must be a local address. If there is a need to contact the router's IP address from outside the local network, a static mapping must be defined to give the router a global address, as well.

NAT only performs translations on packets passing between inside and outside ports. Packets from inside-to-inside and outside-to-outside ports are not translated.

SNMP Agent Configuration

SNMP (Simple Network Management Protocol) is a protocol that governs the communication between a management station (e.g., a computer running the appropriate software) and a program called an agent, which monitors the status of a network hardware device such as a host or router. The SNMP maintains a Management Information Base (MIB) that contains information regarding the device's status and configuration settings.



NOTE:

The Router Module agent is distinct from the one that resides on the DACS II AX System Manager Controller. The MIB is not accessible via the System Manager Controller, but is accessible via the Router Module's LAN or WAN ports.

Procedure

To configure the SNMP Agent:

1. From the *Configuration Menu*, place your cursor on the *SNMP Agent* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router   Slot: 09   Help = [?]
                                SNMP agent configuration menu

System group parameters...
System domain name....: enter domain name here
System description....: Lucent Technologies   AX - Multiprotocol Router
System location.....: enter location here
System contact.....: enter contact name here
Trap controls...
Traps.....: Enabled
Authentication traps..: Enabled

Client-manager IP addresses...           Community profiles...
(used for trap destinations)             Read-only:           Read-write:
0.0.0.0           0.0.0.0           public           private
0.0.0.0           0.0.0.0           public           private
0.0.0.0           0.0.0.0           public           private
0.0.0.0           0.0.0.0           public           private
```

Figure 20-16. SNMP Agent Configuration Submenu

2. Select SNMP Agent parameters from here. Refer to the field descriptions on the following pages.
 3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the Configuration Menu.
-

SNMP Agent Configuration Field Descriptions

System Group Parameters

System domain name: *(text field)* This field is used to uniquely identify the Router Module, and can contain up to 22 alphanumeric characters. This corresponds to the MIB-II sysName variable.

System description: This field is used to provide a description of the system that is seen by the SNMP agent. This field is not user-programmable. This corresponds to the MIB-II sysDescr variable.

System location: *(text field)* This field defines the physical location of the DACS II AX containing the Router Module (e.g., Utility Room, Ground floor), and can contain up to 19 alphanumeric characters. This corresponds to the MIB-II sysLocation variable.

System contact: *(text field)* This field identifies the contact person for the Router Module, and provides information on how to contact this person. It can contain up to 23 alphanumeric characters. This corresponds to the MIB-II sysContact variable.

Trap Controls

Traps: *(option field)* This parameter is used to *Enable* or *Disable* SNMP trap messages.

Authentication Traps: *(option field)* When this parameter is *Enabled*, the bridge/router sends authentication traps when an SNMP request is received with an invalid community string. If the strings do not match, access is denied. If the strings match, read-only or read/write access is provided, depending on the community string matched. The traps are prevented when the parameter is *Disabled*.

Client-manager IP Addresses: The Client-Manager IP Addresses must be entered in "dotted decimal notation." The addresses should match the IP addresses of the SNMP network management station that will receive SNMP traps. Up to 8 addresses can be entered.

Community Profiles

Read-Only Community: *(text field)* This is the community string used for the read-only access to the bridge's MIB objects. The default text setting is *public*.

Read-Write Community: *(text field)* This is the community string used for read-write access to the bridge's MIB objects. If this parameter is set to the same value as the Read-Only Community profile, write access will be denied. The default text setting is *private*.

Alarm Contact Configuration

Alarm Contact configuration is used to enable and disable the alarm LEDs on the front bezel that will be used to report the alarm status of attached equipment.

**NOTE:**

Prior to configuring the alarm contacts, you must configure jumpers located on the Interface (rear) Module. These jumpers determine if the Channelized Router Hub is providing current for the alarm circuits to detect alarm relay closure, or if the remote device is providing current.

Procedure

To configure the Alarm Jumpers:

1. Locate the jumpers (J4, J5, and J6) on the Interface Module.

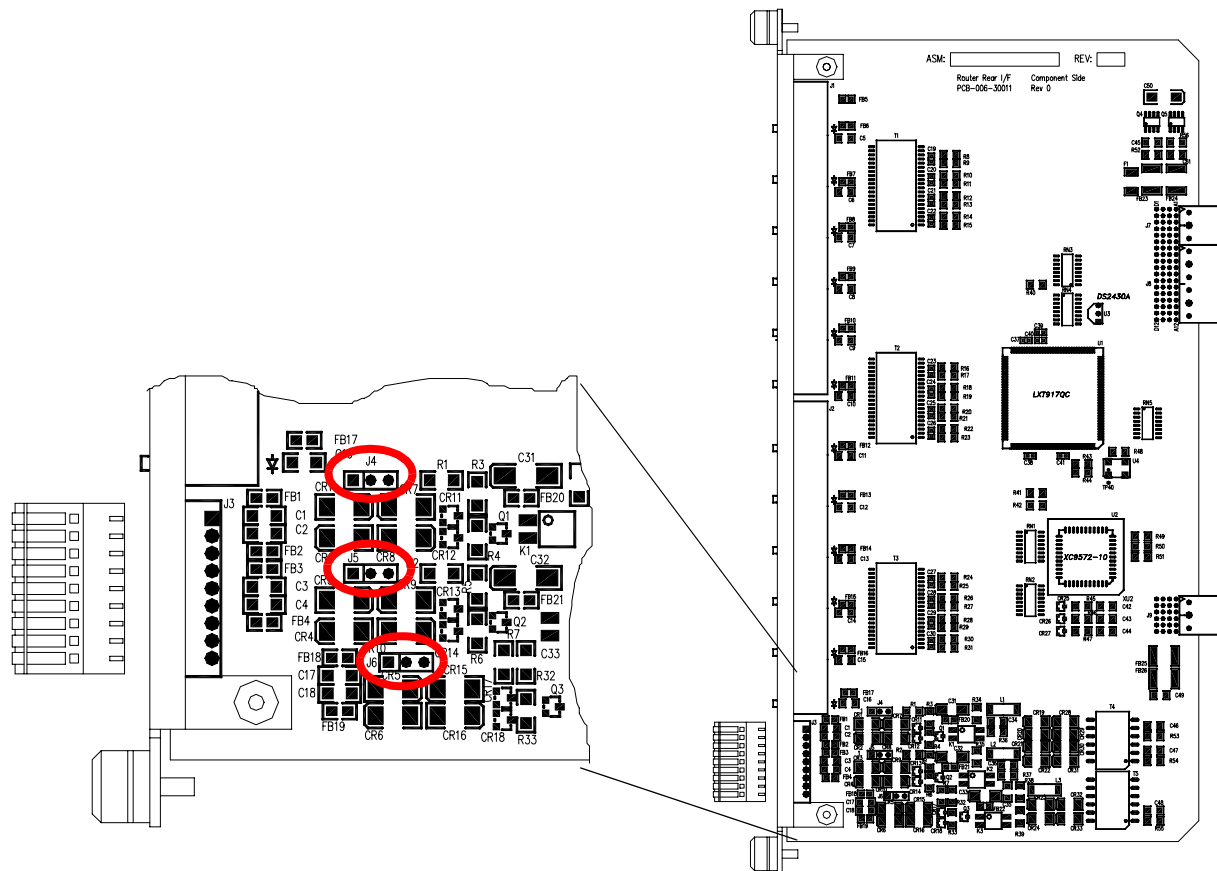


Figure 20-17. Alarm Jumper Location

2. Configure the jumpers according to which end of the circuit will be providing the power, as follows:
 - If the Channelized Router Hub is providing power for the circuit, pin 1 is jumpered to pin 2. This will provide voltage to the alarm circuit. If the circuit (alarm relay) is closed and voltage (nominally 8-12vdc) is detected, the Alarm LED on the Application Module will be green (normal status). If the circuit (alarm relay) opens and no voltage is present, the alarm LED on the Application Module will be red (Alarm status).

- If the remote device is providing power for the circuit, pin 2 is jumpered to pin 3. This will utilize the voltage provided by the remote unit to power the circuit. If the circuit is closed and voltage (+2vdc to +60vdc or -2vdc to -60vdc) is detected, the Alarm LED on the Application Module will be green (normal status). If the circuit is open and no voltage (or minimal voltage from -2vdc to +2vdc) is present, the alarm LED on the Application Module will be red (Alarm status).

Procedure - Configure User Alarms

To configure the User Alarms:

1. From the Configuration Menu, place your cursor on the *Alarm Contact* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies  DACS II AX - Multiprotocol Router Slot: 09  Help = [?]  
  
Alarm contact configuration...  
  
Alarm 1.....: Disable           Alarm 1 Status.....: Off  
Alarm 2.....: Disable           Alarm 2 Status.....: Off  
Alarm 3.....: Disable           Alarm 3 Status.....: Off
```

Figure 20-18. User Alarms Configuration Submenu

2. From this submenu, the user alarms can be enabled or disabled, and their status is displayed. Refer to the field descriptions on the following page.
3. Move your cursor to the applicable alarm and press **<Enter>** until either *Enable* or *Disable* appears. Once your changes are made, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *Configuration Menu*.

**User Alarms
Configuration
Field Descriptions**

Alarm (1, 2, 3): (*option field*) *Enable* indicates that the alarm circuit connected to a remote unit is active. *Disable* indicates that the alarm circuit connected is inactive.

Alarm (1, 2, 3) Status: Displays the current status of the alarm circuit as either *Off* or *On*.

Bridge Address Table

The Bridge Address Table is used to configure a correlation between each MAC address and a port and DLCI or other virtual port. This user-configurable screen is used to manually pre-define addresses to be loaded into the bridge filtering table.



NOTE:

The bridge function also learns addresses automatically, these can be displayed via the learn addresses, they are not displayed here. Refer to the Bridge Address Table in the Router Utilities section for information on how to view automatically configured bridge addresses.

Procedure

To configure the Bridge Address Table:

1. From the Configuration Menu, place your cursor on the *Bridge Address Table* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]					
Bridge address configuration menu...			Page 1 of 16		
Physical-address	port	DLCI	Physical-address	port	DLCI
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16

Figure 20-19. Bridge Address Configuration Menu

2. Configure the Bridge Addresses from here. Refer to the field descriptions on the following page.
 3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *Configuration Menu*.
-

**Bridge Address
Configuration
Field Descriptions**

Physical Address: (*text field*) This hexadecimal number represents an Ethernet address. The Router Module automatically learns LAN addresses upon power up. However, you can also manually enter LAN addresses. Manually entered addresses (static addresses) are stored in FLASH memory, so they do not have to be reconfigured if there is a power failure. Up to 512 addresses can be entered. You can page up/down through 16 pages of addresses. Each page displays 32 addresses.

Port: (*option field*) This field identifies the virtual port on which frames destined for a particular address are transmitted. The entries can be LAN or WAN 1-32.

DLCI (Data Link Control Identifier): (*option field*) This field specifies which DLCI is to be used when the port is configured for Frame Relay. The range is from 16 to 1023. This field is not used if the port is a LAN port.

DHCP/Bootp Relay

Procedure

To configure the Dynamic Host Configuration Protocol/Bootstrap Protocol (DHCP/BOOTP) Relay:

1. From the *Configuration Menu*, place your cursor on the *DHCP/Bootp Relay* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies  DACS II AX - Multiprotocol Router  Slot: 09  Help = [?]  
  
DHCP/Bootp relay configuration menu...  
  
Enabled:.....: No  
Maximum Hops.....: 4  
  
Server address      Logical port (required only if Server address is broad-  
cast)  
-----  
0.0.0.0             0  
0.0.0.0             0  
0.0.0.0             0  
0.0.0.0             0
```

Figure 20-20. DHCP/Bootp Relay Configuration Submenu

2. Configure the DHCP/Bootp Relay parameters from here. Refer to the field descriptions on the following page.
3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *Configuration Menu*.

**DHCP/BOOTP
Relay
Configuration
Field Descriptions**

Enabled: (*option field*) Yes enables DHCP/Bootp, and the Router Module acts as a relay agent that passes DHCP messages (e.g., Ethernet addresses of devices) between DHCP clients and DHCP servers. A DHCP client is an Internet host using DHCP to obtain configuration parameters such as a network address. The DHCP server is the Internet host that returns configuration parameters to DHCP clients.

Max Hops: (*option field*) This field represents the maximum number of hops the Router Module will make to find a particular server. You can specify between 0 and 16 hops. The default value is 4.

Server Address: (*text field*) This field identifies the server on which DHCP packets will be relayed. Up to 4 server addresses can be configured. If the server address is broadcast (255.255.255.255), you must also specify a **logical port**.

Logical Port: (*option field*) This field is used to specify a logical port, if the server address is broadcast (255.255.255.255). You can select logical ports from 0 - 65535.

IP and OSPF Configuration

IP and OSPF are both protocols used in routing applications. IP, a connectionless protocol, defines the datagram and the method of addressing remote nodes or IP addresses as well as routing datagrams to remote hosts. OSPF (Open Shortest Path First), an Interior Gateway Protocol, routes datagrams within an autonomous system. OSPF broadcasts *only* the updated information about directly connected interfaces when a change has occurred.

Procedure

To access the IP and OSPF Configuration Submenu:

1. From the *Configuration Menu*, place your cursor on the *IP and OSPF* field and press **<Enter>**. The following submenu appears:

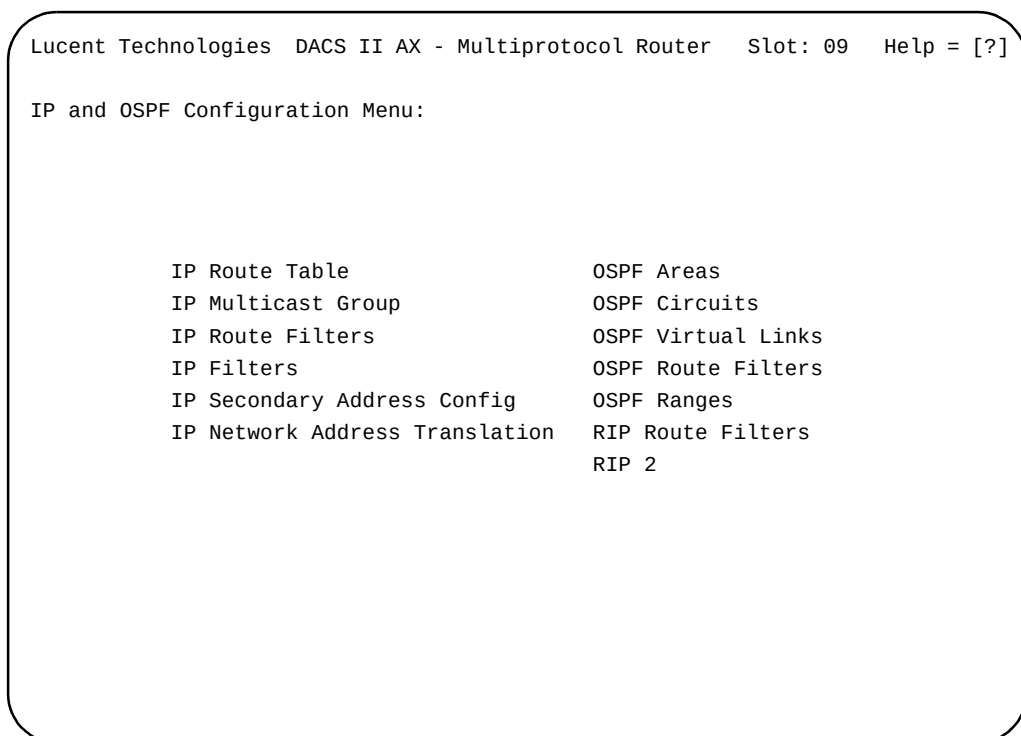


Figure 20-21. IP and OSPF Configuration Submenu

2. The *IP and OSPF Configuration* submenu allows you to select and configure the Router Module for IP or OSPF. Its submenus are listed below, and explained in detail on the pages that follow.

- IP Route Table
 - IP Multicast Group
 - IP Route Filters
 - IP Filters
 - IP Secondary Address
 - IP Network Address Translation
 - OSPF Areas
 - OSPF Circuits
 - OSPF Virtual Links
 - OSPF Ranges
 - OSPF Route Filters
 - RIP Route Filters
 - RIP 2
-

IP Route Table

When IP RIP is enabled, the Router Module automatically learns network addresses. However, you can *manually* configure addresses using the IP Route Table submenu. Manually entered addresses (static addresses) are stored in FLASH memory, so they do not have to be re-configured if there is a power failure. The aging process does not affect them.

You can also page up/down through 16 pages of addresses. Each page displays 16 static addresses. Up to 256 addresses can be entered.

Procedure

To configure the IP Route Table:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *IP Route Table* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IP route table configuration menu Page 1 of 16

Dest Address	Mask	NextHop	Hops
12.0.0.1	255.0.0.0	10.0.0.2	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0
0.0.0.0	0.0.0.0	0.0.0.0	0

Page next/prev = ['+'/'-']
Entry up/down = ['u'/'d']
Entry insert/erase = ['i'/'e']

Figure 20-22. IP Route Table Configuration Submenu

2. Configure the IP Route Table from here. Refer to the field descriptions on the following page.

3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *IP and OSPF Configuration* submenu.

IP Route Table Field Descriptions

Destination Address: (*text field*) Every interface carrying IP traffic must have a unique IP address. Each address precisely identifies the location of the data's destination. Normally, this would be the destination network number, but it can also be set to a specific host address, if desired. The address is entered in the four-field "dotted decimal notation" format specified by IP address rules.

Mask: (*text field*) The IP mask is generated automatically; however, it can be overridden to support subnetting. The mask is represented in "dotted decimal notation."

Next Hop: (*text field*) This is the IP address to which an IP frame is to be forwarded. The network portion of this address must match the network portion of the destination router. The next hop is represented in "dotted decimal notation."

Hops: (*option field*) This represents the number of hops required to reach the remote network. Static routing information overrides any dynamic routing information. The range is 0-15.



NOTE:

If the next hop is configured, and there is no destination address or mask, then the next hop will become the default route. Any packets destined for a network not in the route table will be routed to the default route.

IP Multicast Group

The *IP Multicast Group* submenu provides a method for forwarding IP multicast datagrams through the Internetwork. IP multicast datagrams are messages with destination IP addresses within the range of 224.0.0.0 and 239.255.255.255 are otherwise known as class "D" addresses. When the Router Module receives a datagram addressed to the multicast address, it will forward the datagram out every port that is configured for that multicast group, except the port on which it was received. If no ports are defined for the particular multicast address, the datagram is discarded.

Procedure

To configure the IP Multicast Group:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *IP Multicast Group* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IP multicast group configuration menu...Page 1 of 8

Multicast-address	port	DLCI	Multicast-address	port	DLCI
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0
0.0.0.0	LAN	0	0.0.0.0	LAN	0

Figure 20-23. IP Multicast Group Configuration Submenu

2. Configure the IP Multicast Group from here. Refer to the field descriptions on the following pages.

3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *IP and OSPF Configuration* submenu.

Multicast IP addresses are mapped to Ethernet addresses by replacing the lower 23 bits of the Ethernet group address 01:00:5E: 00:00:00 with the lower 23 bits of the IP multicast address (as specified in RFC 1112). For example, the IP multicast address 224.0.0.9 would be mapped to the Ethernet address 01:00:5E: 00:00:09.

Each entry in the IP multicast group submenu allows the inclusion of a specific port in an IP multicast group. A multicast group is a list of IP addresses to which messages are transmitted. If multiple ports are part of the multicast group, an entry must be filled in for every port. Each must have the same multicast address but with a different port. For example, to include LAN and WAN-1 in the multicast group 224.0.0.9, configure two entries as shown below:

Multicast Address	Port	DLCI
224.0.0.9	LAN	0
224.0.0.9	WAN 1	0

IP Multicast Group Configuration Field Descriptions

Multicast Address: (*text field*) The multicast address is the class "D" IP address that identifies the multicast group. An address that is not a class "D" address will not be accepted. Enter the multicast address in "dotted decimal notation." If you do not know your IP address, consult your network administrator.

Port: (*option field*) This field identifies the virtual port to be included in the multicast group. *LAN* or *WAN 1 - 32* can be selected. The default is *LAN*.

DLCI (Data Link Control Identifier): This field specifies which DLCI is to be used. *0* and *16 - 1023* can be selected. The default is *0*.

If this is not a frame relay port, this field must be set to *0*.

If this is a frame relay port, and the field is set to *0*, then every DLCI on the virtual port will be included in the multicast group.

If this is a frame relay port, and the field is set to a non-0 DLCI number, then only that DLCI will be included in the multicast group.

Additional Information on IP Multicast Groups

Care must be taken in configuring IP multicast groups to avoid routing loops. For example, in the network shown below, a configuration that includes every port on each router in the multicast group would cause a multicast datagram to cycle through the network forever.

A multicast datagram received on the LAN port of the Router Module would be broadcast to Router B and Router C through the wide area ports. The wide area ports would in turn send a copy to each other. Then, each wide area port would send a copy back to the Router Module.

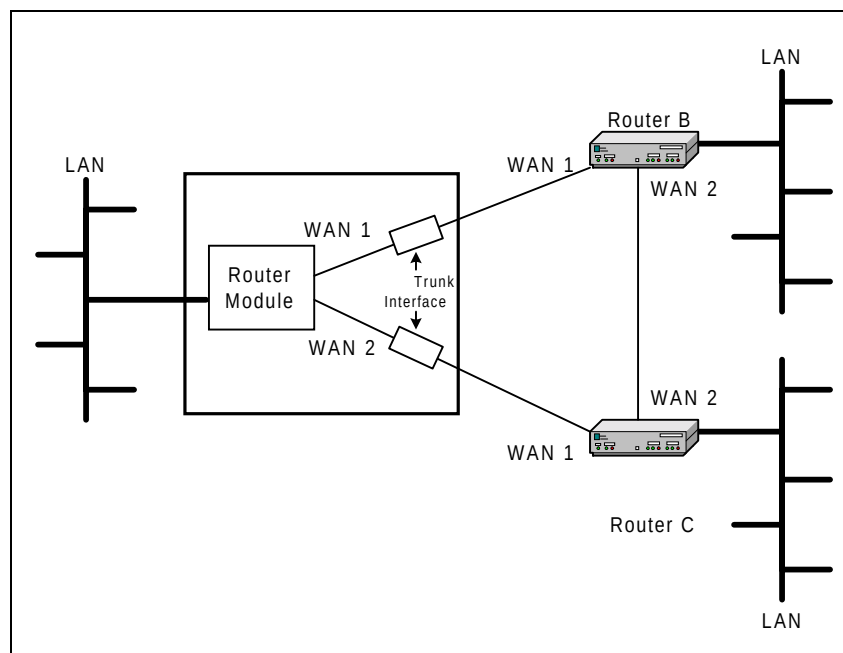


Figure 20-24. Depiction of an IP Multicast Group

The routing loop described above could be alleviated by the following configurations:

- On the Router Module, configure LAN, WAN 1 and WAN 2 as part of the multicast group.
- On Router B, configure LAN and WAN 1 as part of the multicast group.
- On Router C, configure LAN and WAN 1 as part of the multicast group.

IP Route Filters Configuration

Procedure

To configure the IP Route Filters:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *IP Route Filters* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Page 1 of 2

IP Address	Mask	OSPF	RIP
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No
0.0.0.0	0.0.0.0	No	No

Page next/prev = ['+'/'-']
Entry up/down = ['u'/'d']
Entry insert/erase = ['i'/'e']

Figure 20-25. IP Route Filters Configuration Submenu

2. Press **<Space>** or **<Backspace>** to move between IP address fields. Place your cursor on the desired field, press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router    Slot: 09    Help = [?]  
  
IP address.....: 0.0.0.0  
Network mask.....: 0.0.0.0  
OSPF.....: No  
RIP.....: No
```

Figure 20-26. IP Route Filters Configuration Entry Submenu

3. Configure the IP Route Filters from here. Refer to the field descriptions on the following page.
4. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *IP Route Filters Configuration* submenu.
5. Configure another filter, or when all filters are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.

**IP Route Filters
Field Descriptions**

IP Address: *(text field)* Enter the IP address for which the filter is being configured.

Network Mask: *(text field)* The network mask is generated automatically; however, it can be overridden to support subnetting. The mask is represented in "dotted decimal notation."

OSPF: *(option field)* Updates network mask information and enables a single multi-port router to work with different subnet masks and non-contiguous networks. It also allows network designers greater freedom in assigning addresses. *Yes* enables OSPF.

RIP: *(option field)* Based on the Bellman-Ford distance vector algorithm, the Routing Information Protocol (RIP) creates a unique routing table that identifies the best path from itself to all other routers in the network. *Yes* enables RIP.

IP Filter Configuration

The Router Module's IP Filtering capability provides the ability to filter IP frames based on the following criteria:

- reaction (block, block&log, block&syslogd, pass)
- direction (in, out)
- source and/or destination IP addresses and netmasks
- source and destination source port comparator and port number
- protocol field of IP frame
- source and destination ports for UDP and TCP
- code bits for TCP

Frames that are filtered cause one of the following to occur:

- the frame is simply ignored
- a message is logged in the local event log
- a message is sent via syslog to syslogd running on some remote machine

Each filter can consist of up to 32 individual rules. Named filters are created and can be associated with one or more logical ports.

**CAUTION:**

IP filtering is a powerful feature provided for security or firewall purposes. It should be invoked with care. It is necessary that you have detailed knowledge of networking protocols in order to set up a useful filter. It is very easy to set up a filter which will prevent all traffic from passing through the Router Module; therefore, you should exercise extreme caution when configuring any filter.

**Procedure -
Configure IP Filter
for Logical Port**

To configure an IP Filter for a Logical Port:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *IP Filters* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Filter selection menu... Page 1 of 1

Syslog remote ip address: 0.0.0.0

Filter name	Comment
Server 1	Lab Server
Server 2	Engineering Server

Page up/down = ['+' / '-']
Add filter = ['a' / 'A']
Erase filter = ['e' / 'E']

Figure 20-27. IP Filter Selection Submenu

The *Filter Selection* submenu displays a list of all currently saved filters. No indication is given here as to whether or not a particular filter is actually in use.

Association of a named filter with a logical port is performed from the *Logical Port Configuration* submenu. This submenu is used to configure a new or saved filter or to erase a saved filter. It is also the place to set the IP address to which syslog messages will be sent for any filters that invoke this reaction.

2. From the *IP Filter Selection* submenu, you can press **A** or move your cursor to an empty line and press **<Enter>** to configure a new filter. You can also move your cursor to an occupied line and press **<Enter>** to configure an existing filter. In either case, the following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router   Slot: 09   Help = [?]  
  
Single filter configuration menu...   Page 1 of 3  
  
Name:                               Comment:  
  
in/out block  
in/out block  
in/out block  
in/out block  
in/out block  
in/out block  
in/out block  
in/out block  
in/out block  
in/out block  
in/out block  
  
Page up/down =      ['+'/'-']  
Rule up/down =      ['u'/'d']  
Rule insert/erase = ['i'/'e']
```

Figure 20-28. Single Filter Configuration Submenu

3. The *Single Filter Configuration* submenu displays a summary line for each rule of the filter that is being configured. *The filter must be named before configuration of any rules can be performed.* Enter a name of up to 19 alphanumeric characters in the *Name* field. A comment of up to 19 alphanumeric characters can be entered in the *Comment* field if desired. The comment will be visible later when associating a filter with a logical port.
4. To erase a rule, move your cursor to the corresponding line and press **E**. The rule is erased.
5. To insert a new rule in between two rules, move your cursor to the point where you wish to insert the new rule and press **I**. The new rule is inserted in the space above the cursor position.

6. To configure a single rule (either new or inserted), move your cursor to the corresponding line and press **<Enter>**. The following submenu appears:

```
Lucent Technologies   DACS II AX - Multiprotocol Router   Slot: 09   Help = [?]

Single rule configuration menu...

Filter name.....:
Comment.....:
Reaction.....: block
Direction.....: in/out
Source IP address.....: 0.0.0.0
Source IP netmask.....: 0.0.0.0
Source port comparator.....:
Source port number.....: 0
Destination IP address.....: 0.0.0.0
Destination IP netmask.....: 0.0.0.0
Destination port comparator:
Destination port number.....: 0
Protocol.....: 0
TCP code bits.....:
```

Figure 20-29. Single Rule Configuration Submenu

7. Move your cursor to the *Reaction* field to set what will happen when a frame is filtered. Press **<Enter>** to toggle through the possible reactions. Refer to the field descriptions for a list of the possible reactions.
8. Move your cursor to the *Direction* field to apply the filter to incoming, outgoing, or both incoming and outgoing frames.



NOTE:

No filtering is applied to frames that originate from within the Router Module (e.g. the “ping” utility from the Utilities Menu).

9. Select the address or a range of addresses that will be filtered. Use the source and/or destination IP address and netmask fields to enter the addresses.
10. To filter frames based on port number, the source and destination “port comparator” fields are used in conjunction with the “port number” fields (e.g., source port ≥ 1024). Port numbers must be entered by number;

however, some well known port numbers will be shown by name on the *Single Filter Configuration* submenu (e.g., "Telnet" instead of "23"). Refer to Internet RFC 1700, "ASSIGNED NUMBERS" for a list of these numbers. A few of the more commonly used numbers are listed below. This list is by no means an exhaustive sample; use RFC 1700 as a master reference.

Commonly Used Protocol Numbers
1 ICMP
2 IGMP
6 TCP
17 UDP

11. To filter frames based on layer 3 protocols, use the *Protocol* field. Protocol numbers must be entered by number; however, some well known protocols will be shown by name on the *Single Filter Configuration* submenu (e.g., "TCP" instead of "6"). Refer to Internet RFC 1700, "ASSIGNED NUMBERS" for a list of these numbers. A few of the more commonly used numbers are listed below. This list is by no means an exhaustive sample; use RFC 1700 as a master reference.

Commonly Used Port Numbers
20 FTP-data
21 FTP
23 Telnet
25 SMTP
53 Domain Name Service
69 TFTP
80 HTTP
110 POP3
161 SNMP
520 RIP

12. To further filter frames based on TCP code bits, toggle the *TCP code bits* option. For example, to prevent all incoming TCP connections, set *Protocol* to 6 (for TCP), set *TCP code bits* option to *SYN* and *Direction* to *In*.
13. Once all the filter's rules have been configured, navigate to the *Logical Port Configuration* submenu to choose a filter to associate with the logical port.

**NOTE:**

The last line on the filter must be have a PASS rule configured in order for the filter to work properly.

Procedure - Set IP Address for Syslog Messages

To set the IP Address of the Location Where the Syslog Messages Will Be Sent (for any filters which invoke a Syslog type reaction):

1. From the *IP Filter Selection* submenu, (shown below) move your cursor to the *Syslog remote IP address* field and press **<Enter>**.

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Filter selection menu... Page 1 of 1

Syslog remote ip address: 0.0.0.0

Filter name	Comment
Server 1	Lab Server
Server 2	Engineering Server

Page up/down = ['+' / '-']
Add filter = ['a' / 'A']
Erase filter = ['e' / 'E']

Figure 20-30. IP Filter Selection Submenu

2. Type in the IP address to which syslog messages will be sent and press **<Enter>**.
3. Press **X** to exit and **Y** save the configuration when prompted.

**Single Rule
Configuration
Submenu Field
Descriptions**

Filter Name: This field displays the Filter Name that was configured earlier.

Comment: This field displays the Comment that was configured earlier, if any.

Reaction: This field is used to set the reaction for the filter. Select from *block*, *block&log*, *block&syslogd* (syslogd = syslogdemon on Unix System on your network central site), and *pass*.

Direction: This field is used to set the filter to apply to incoming, outgoing, or both incoming and outgoing frames. Select from *in*, *out*, or *in/out*.

Source IP Address: This field is used to select a single source address that will be filtered. Enter the address in "dotted decimal notation."

Source IP Netmask: This field is used to select a range of source addresses that will be filtered. Enter the mask in "dotted decimal notation."

Source Port Comparator: To filter frames based on a comparison with the source port number, the source port comparator field is used. Select *<*, *<=*, *=*, *>*, *>=*, or *>* to filter a frame based on a comparison with the source port number entered in the following field. (e.g., source port *>=1024*)

Source Port Number: To filter a frame based on a comparison to the source port number, enter the source port number here. Ports must be entered by number; however, some well known port numbers will be shown by name on the *Single Filter Configuration* submenu (e.g., "Telnet" instead of "23"). Refer to Internet RFC 1700, "ASSIGNED NUMBERS" for a list of these numbers.

Destination IP Address: This field is used to select a single destination address that will be filtered. Enter the address in "dotted decimal notation."

Destination IP Netmask: This field is used to select a range of destination addresses that will be filtered. Enter the mask in "dotted decimal notation."

Destination Port Comparator: To filter frames based on a comparison with the destination port number, the destination port comparator field is used. Select *<*, *<=*, *=*, *>*, *>=*, or *>* to filter a frame based on a comparison with the destination port number entered in the following field. (e.g., destination port *>=1023*)

Destination Port Number: To filter a frame based on a comparison to the destination port number, enter the destination port number here. Ports must be entered by number; however, some well known port numbers will be shown by name on the *Single Filter Configuration* submenu (e.g., "Telnet" instead of "23"). Refer to Internet RFC 1700, "ASSIGNED NUMBERS" for a list of these numbers.

Protocol: To filter frames based on layer 3 protocols, use the *Protocol* field. Protocol must be entered by number; however, some well known protocols will be shown by name on the *Single Filter Configuration* submenu (e.g., "TCP" instead of "6"). Refer to Internet RFC 1700, "ASSIGNED NUMBERS" for a list of these numbers.

TCP Code Bits: To further filter frames based on TCP code bits, toggle the *TCP code bits* option. For example, to prevent all incoming TCP connections, set *Protocol* to 6 (for TCP), set *TCP code bits* option to *SYN* and *Direction* to *In*. The following TCP code bit settings are available:

- **URG:** Urgent pointer field is valid.
 - **SYN:** Synchronize sequence numbers.
 - **FIN:** Sender has reached the end of its byte stream.
 - **RST:** Reset this connection.
 - **PSH:** This segment requires a push.
 - **ACK:** Acknowledgement field is valid.
-

IP Secondary Address Configuration

The Router Module is usually configured as one IP address on a particular network. It is also capable of being configured with multiple IP addresses (up to 120) in order to be able to sit on two or more different networks on the same interface (multiple homing). The *IP Secondary Address Configuration* submenu allows you to set up this multiple homing capability for LAN, WAN 1, WAN 2, etc.

Procedure - Configure Secondary IP Addresses

To configure Secondary IP Addresses:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *IP Secondary Address Config* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Filter selection menu... Page 1 of 1

Syslog remote ip address: 0.0.0.0

Filter name	Comment
Server 1	Lab Server
Server 2	Engineering Server

Page up/down = ['+'/'-']
Add filter = ['a'/'A']
Erase filter = ['e'/'E']

Figure 20-31. IP Secondary Address Configuration Submenu

Press **<Space>** or **<Backspace>** to move between address fields. Place your cursor on the desired field, press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IP secondary address configuration menu:

```
Port.....: LAN
DLCI (0 if not applicable).. 0
IP Address.....: 0.0.0.0
Mask.....: 0.0.0.0
```

Figure 20-32. IP Secondary Address Configuration Entry Submenu

2. Configure the IP Secondary Address from here. Refer to the field descriptions on the following pages.
3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *IP Secondary Address Configuration* submenu.
4. Configure another address, or when all addresses are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.

NOTE:

Additional steps might be required in order to utilize multiple homing in a router-to-router configuration. See page 20-71 for special instructions.

**IP Secondary
Address Field
Descriptions**

Port: *(option field)* Identifies the interface (port) on which frames destined for a particular address are transmitted. *LAN* or *WAN 1 - 32* can be selected.

DLCI (Data Link Control Identifier): *(text field)* This field specifies which DLCI is to be used if Frame Relay is enabled and multi-homing is being assigned to a logical WAN port. The default is 0.

IP Address: *(text field)* The secondary address for the Router Module should be entered in this field.

Mask: *(text field)* The mask is generated automatically; however, it can be overridden to support subnetting. The mask is represented in "dotted decimal notation."

Special Instructions for Router-to-Router Configuration using Secondary Addressing

There are instances that can occur where the Router Module is utilized in a router-to-router configuration with one or more additional routers on a different network. In some of these cases, an additional configuration procedure must be followed in order to take full advantage of the Router Module's multiple homing capability. An example of this is shown below:

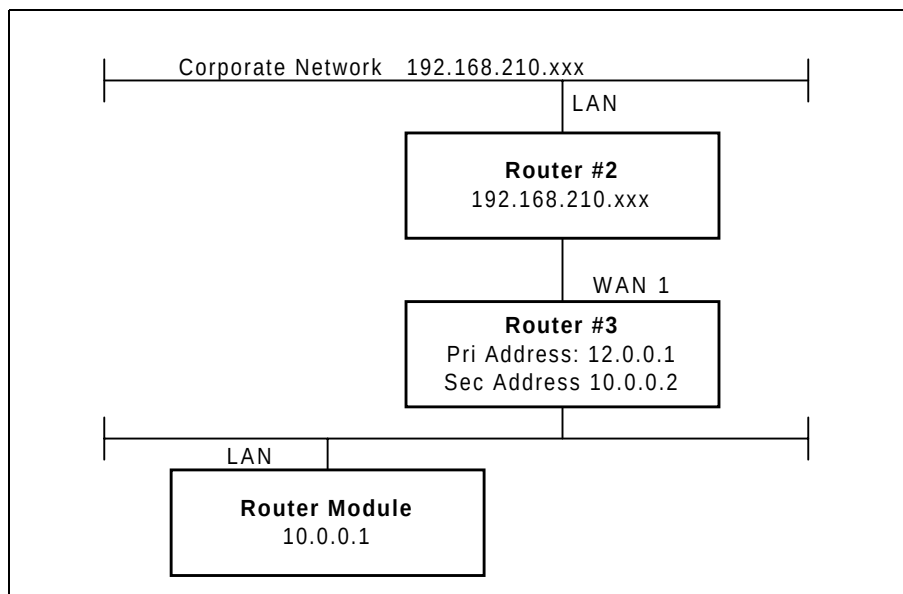


Figure 20-33. Sample Router-to-Router Configuration with Multiple Homing

In the above figure, Router #3 can communicate with the Router Module's LAN address because Router #3 has been configured with two addresses (multiple homing). However, in order for the Router Module to communicate with Router #3, you must configure a static route in the IP Route Table, as shown in the IP Route Table Configuration section. For this particular example, you would configure the Destination Address as 12.0.0.1, and the Next Hop as 10.0.0.2.

IP Network Address Translation

Network Address Translation (NAT) is a method for translating private internal IP addresses into globally assigned IP addresses when accessing the public network. It permits a number of inside or private node addresses to access the Internet by translating these private addresses into global addresses. It also serves as a firewall by keeping individual inside IP addresses hidden from the outside world. NAT is configured by defining address pools and specifying whether a port is *Inside* or *Outside*.

Procedure

To configure Network Address Translation:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *IP Network Address Translation* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router   Slot: 09   Help = [?]  
  
Network address translation configuration menu  
Default timeout (in seconds)...:86400  
UDP timeout (in seconds).....:300  
DNS timeout (in seconds).....:60  
TCP timeout (in seconds).....:86400  
FINRST timeout (in seconds)....:60  
1st Local Address      1st Local Address      1st Local Address  
192.168.112.1          0.0.0.0          0.0.0.0  
192.168.112.6          0.0.0.0          0.0.0.0  
192.168.112.11         0.0.0.0          0.0.0.0  
0.0.0.0                0.0.0.0          0.0.0.0  
0.0.0.0                0.0.0.0          0.0.0.0  
0.0.0.0                0.0.0.0          0.0.0.0  
0.0.0.0                0.0.0.0          0.0.0.0
```

Figure 20-34. Network Address Translation Configuration Submenu

**Network Address
Translation Field
Descriptions**

Default timeout (in seconds): *(text field)* When utilizing "dynamic" type, the number of seconds that an address entry is valid before an idle timeout occurs. When the idle timeout occurs, the address is free for another user. The default setting is *86400* (24 hours).

UDP (User Datagram Protocol) timeout (in seconds): *(text field)* When utilizing "overloaded" type and User Datagram Protocol, enter the number of idle seconds that will elapse before the session is torn down. The default setting is *300*.

DNS (Domain Name System) timeout (in seconds): *(text field)* When utilizing "overloaded" type and Domain Name System, enter the number of idle seconds that will elapse before the session is torn down. The default setting is *60*.

TCP (Transmission Control Protocol) timeout (in seconds): *(text field)* When utilizing "overloaded" type and Transmission Control Protocol, enter the number of idle seconds that will elapse before the session is torn down. The default setting is *86400* (24 hours).

FINRST (Finish/Reset) timeout (in seconds): *(option field)* The FINRST setting is used to address TCP implementation problems as per RFC-1122 and RFC-2525. FINRST refers to two control bits that reside in the 14th octet of the TCP header. FIN = No more data from sender, and RST = Reset the connection. The timeout setting for FINRST prevents "hung" TCP connections if an RST acknowledgment to a FIN is not received before the timeout period ends. When utilizing "overloaded" type, enter the number of seconds that should elapse without the RST acknowledgement before the session will be torn down. The default setting is *60*.

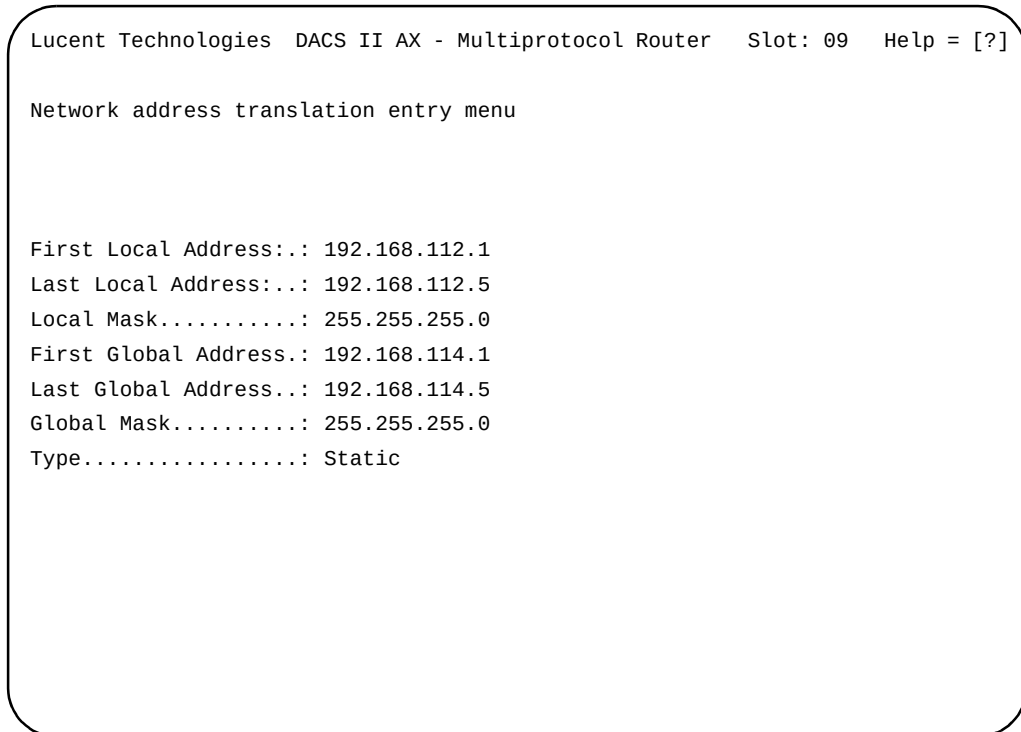
1st Local Address: *(text field)* Enter the first local (private) address in the pool in "dotted decimal notation."

Network Address Translation Entry

Procedure

To configure a Network Address Translation Entry:

1. From the *IP Network Address Translation Configuration* submenu, move your cursor to the desired *1st Local Address* field, and press **<Enter>**. The following submenu appears:



```
Lucent Technologies  DACS II AX - Multiprotocol Router  Slot: 09  Help = [?]  
  
Network address translation entry menu  
  
First Local Address.: 192.168.112.1  
Last Local Address.: 192.168.112.5  
Local Mask.: 255.255.255.0  
First Global Address.: 192.168.114.1  
Last Global Address.: 192.168.114.5  
Global Mask.: 255.255.255.0  
Type.: Static
```

Figure 20-35. Network Address Translation Configuration Entry Submenu

2. Configure Network Address Translation from here. Refer to the field descriptions on the following page.
3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *Network Address Translation Configuration* submenu.
4. Configure another address, or when all addresses are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.

Network Address Translation Entry (Continued)

Procedure - Delete an Entry To delete an entry, set all address fields to 0.0.0.0.



NOTE:

You must set ALL entries to 0.0.0.0, otherwise the unit will not function properly.

**Network Address
Translation Entry
Field Descriptions**

First Local Address: *(text field)* Enter the first local (private) address in the pool in "dotted decimal notation."

Last Local Address: *(text field)* The last local address in the pool must be greater than or equal to the first local address. If only one address is in the pool, set the last local address equal to the first local address.

Local Mask: *(text field)* Enter the private network mask or if the single first and last local address are equal, enter a host mask (255.255.255.255).

First Global Address: *(text field)* Enter the first global address in the pool in "dotted decimal notation."

Last Global Address: *(text field)* The last global address in the pool must be greater than or equal to the first global address. If many to one (overloading) will be used, set the last global address equal to the first global address.

Global Mask: *(text field)* The assigned Global Network Mask.

Type: *(option field)* Select one of the following:

- **Static** - Static entries are permanent and have a configured local to global mapping relationship (the number of local addresses must equal the number of global addresses). If more than one address is defined in the pool, then the first local is mapped to the first global, and the next local is mapped to the next global, etc. Static entries do not time out.
- **Dynamic** - Dynamic pools have the local to global mapping done on demand to the next available global address. Mappings created from a dynamic pool time out, if idle, for more than the configured time out value.
- **Overloaded** - Configures all local addresses to be mapped to one global address.

After a NAT entry is configured, press **X** to exit the screen. The first local address for that entry will appear as an identifier for the entry on the *Network Address Translation Configuration* submenu.

OSPF Protocol

Open Shortest Path First (OSPF) is a link-state routing protocol that utilizes routing information distributed between routers as a means to find the best path for routing IP traffic over a TCP/IP network. It also uses less router-to-router update traffic than RIP protocol. It does this by sending out only the routing changes that have occurred to the network, rather than sending out complete routing information on a routine basis. Prior to configuring the Router Module(s) for OSPF, an understanding of how this protocol functions is necessary. Figure 20-36 is followed by a basic explanation of how OSPF functions for the configuration shown in the figure.

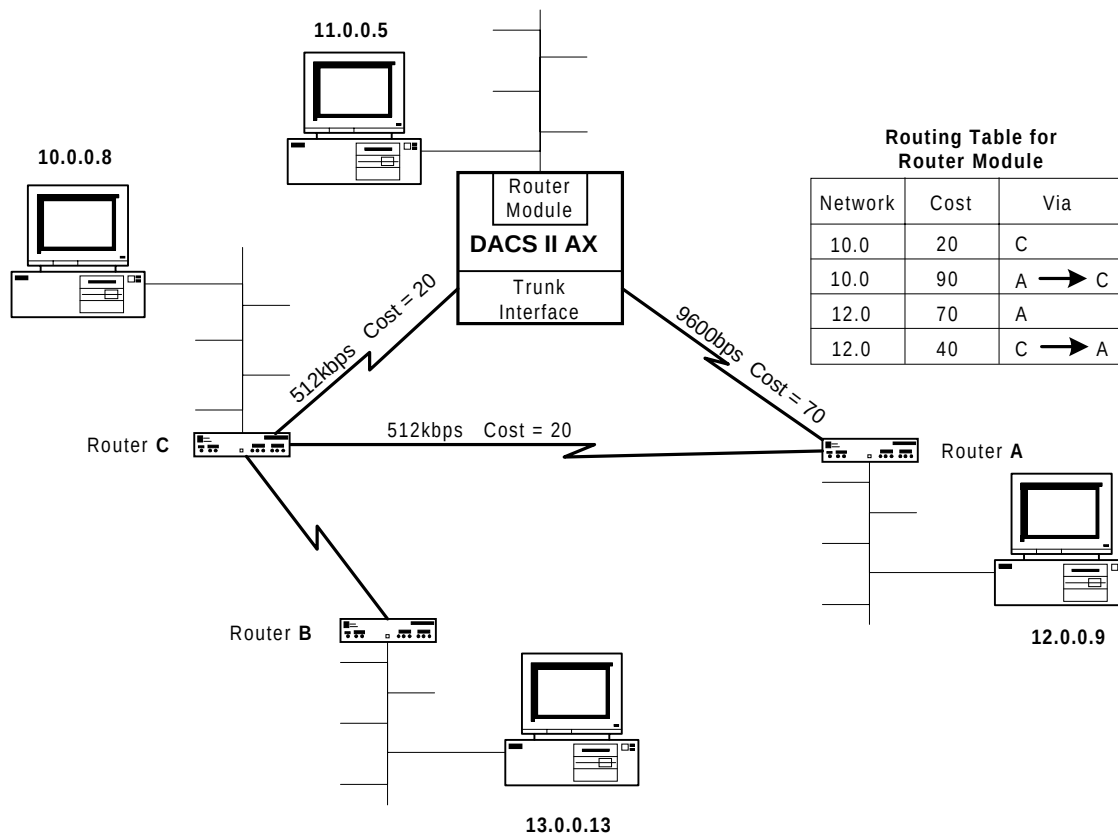


Figure 20-36. OSPF Protocol

In the example shown in the Figure 20-36, assume that you want to route data from Network 11.0 to Network 10.0 within the OSPF area. The connection from the Router Module going directly to Router C has a cost of 20, while routing from the Router Module to Router C indirectly via Router A results in a higher cost of 90. In this case, OSPF would determine that the direct route is the most efficient choice.

In some cases, the direct route is not always the best. Assume that you want to route data from Network 11.0 to Network 12.0. Routing from the Router Module to Router A directly results in a cost of 70, while routing from the Router Module to Router B indirectly through Router C results in a cost of only 40. OSPF would determine that the most efficient choice in this case would be the indirect route.

OSPF Areas

An OSPF area is a collection of networks and routers that are grouped together in order to utilize OSPF protocol. Each area keeps track of its own routing information, and it will pass any changes to this routing information on to other areas.

The following steps are necessary in order to configure OSPF areas. Each OSPF router must be configured into at least one OSPF area. If more than one OSPF area is configured, then at least one of the areas must be configured as the backbone or Area 0. The backbone carries an identifier of 0.0.0.0, and cannot be configured as a stub area. All other areas need to be physically connected to the backbone. This physical connection allows all areas to advertise routing information to other areas. To configure an area as a backbone, set the area ID as 0.0.0.0.

To configure OSPF Areas:

- ```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

OSPF Areas Configuration Menu:

Area ID Stub Area Stub Metric
0.0.0.0 No 0
0.0.0.0 No 0
0.0.0.0 No 0

Page next/prev = ['+ '/' -']
Entry up/down = ['u'/'d']
Entry insert/erase = ['i'/'e']
```

**Figure 20-37. OSPF Areas Configuration Submenu**

**Procedure  
(Continued)**

2. Move your cursor to the *Area ID* that you wish to configure and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

OSPF Area Configuration Menu:

Area ID.....: 0.0.0.0

Stub Area.....: No
Stub Metric.....: 0
```

**Figure 20-38. OSPF Area Configuration Entry Submenu**

3. Configure OSPF Areas from here. Refer to the following field descriptions.
4. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *OSPF Area Configuration* submenu.
5. Configure another area, or when all areas are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.

## OSPF Area Configuration Entry Field Descriptions

---

**Area ID:** *(text field)* An area is a group of contiguous networks and attached hosts. Each OSPF router must be configured into at least one OSPF area. Enter the IP address of the network area in "dotted decimal notation."

**Stub Area:** *(option field)* Recommended in OSPF areas that are connected to other areas through one or more area border routers (ABRs). Autonomous System Border Routers (ASBRs) are not supported. Stub area routing is based on default fixed routes and predefined routing paths. The stub area represents a "dead end" in the network, and entire stub area is configured so that all items within the area have the same cost to the outside world. This is beneficial because any connected routers will require less memory and generally create less network overhead. Select Yes to configure an area as a stub area.

**Stub Metric:** *(text field)* The number of links or hops (cost) between the source and the stub area.

---



## OSPF Circuits

Characteristics of a given OSPF area can be configured in the OSPF Circuit submenu. These characteristics will determine the configuration of the OSPF area on each interface, along with the frequency of update messages, router priority, etc.



**NOTE:**

All circuit configuration settings must be set the same within each OSPF network node in order for OSPF to function properly.

### Procedure - Configure OSPF Circuits

To configure the OSPF Circuits:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *OSPF Circuits* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

OSPF Circuit Menu:

External metrics...: AS Type 2 Trace NBR.....: Enable
Auto virt links...: Enable Trace LSA.....: Enable
ASBDR.....: Yes Trace DR.....: Disable
Priority.....: 1

PORT AREA ID PORT AREA ID PORT AREA ID
LAN 0.0.0.0 WAN 11 0.0.0.0 WAN 22 0.0.0.0
WAN 1 0.0.0.0 WAN 12 0.0.0.0 WAN 23 0.0.0.0
WAN 2 0.0.0.0 WAN 13 0.0.0.0 WAN 24 0.0.0.0
WAN 3 0.0.0.0 WAN 14 0.0.0.0 WAN 25 0.0.0.0
WAN 4 0.0.0.0 WAN 15 0.0.0.0 WAN 26 0.0.0.0
WAN 5 0.0.0.0 WAN 16 0.0.0.0 WAN 27 0.0.0.0
WAN 6 0.0.0.0 WAN 17 0.0.0.0 WAN 28 0.0.0.0
WAN 7 0.0.0.0 WAN 18 0.0.0.0 WAN 29 0.0.0.0
```

**Figure 20-39. OSPF Circuit Submenu**

2. Configure the seven settings at the top of the menu. (Refer to the field descriptions section immediately following this procedure.) Then to configure an individual circuit, move your cursor to the port that you wish to configure and press **<Enter>**. The following menu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

OSPF Circuit Entry Menu:

Virtual Port: WAN 1
Area ID.....: 0.0.0.0
Auth Type.....: None
Auth Key.....:
Hello Interval....: 30
Dead Interval.....: 90
Transit Delay.....: 1
Retrans Interval..: 5
```

---

**Figure 20-40. OSPF Circuit Entry Submenu**

3. Configure an individual OSPF circuit from here. Refer to the field descriptions on the following pages.
  4. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *OSPF Circuit* submenu.
  5. Configure another circuit, or when all circuits are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.
-

## OSPF Circuit Configuration Field Descriptions

**External Metrics:** (*option field*) *AS Type 1* routes are supposed to be from Interior Gateway Protocols whose external metrics are directly comparable to OSPF metrics. When a routing decision is being made, OSPF will add the internal cost of the route to the AS Border router to the external metric. *AS Type 2* routes are used for Exterior Gateway Protocols whose metrics are not comparable to OSPF metrics. In this case, only the internal OSPF cost to the AS Border router is used in the routing decision.

**Auto Virt Links:** (*option field*) Virtual links are used to connect physically separate components of the backbone area. The two endpoints of a virtual link are area border routers. The virtual link must be enabled in both routers. This field allows you to *Enable* or *Disable* automatic sensing of these virtual links.

**ASBDR:** (*option field*) Autonomous System Boundary Router. A router that exchanges routing information with routers belonging to other Autonomous Systems. Such a router has AS external routes that are advertised throughout the Autonomous System. (An Autonomous system is defined as another routing domain.) The path to each AS boundary router is known by every router in the AS. Select *Yes* or *No* to set the Router Module as an Autonomous System Boundary Router.

**Trace NBR:** (*option field*) This field allows you to *Enable* or *Disable* the tracing of a neighboring router.

**Trace LSA:** (*option field*) This field allows you to *Enable* or *Disable* the tracing of Link State Advertisements (LSAs).

**Trace DR:** (*option field*) This field allows you to *Enable* or *Disable* the tracing of the Designated Router.

**Port or Virtual Port:** This is the virtual port (*LAN* or *WAN 1 - 32*) on which the OSPF circuit is being configured.

**Area ID:** (*text field*) An area is a group of contiguous networks and attached hosts. Each OSPF router must be configured into at least one OSPF area. Enter the IP address of the network area to which the router belongs.

**Auth Type:** Select the type of authentication protocol that will be used from among *None*, *Simple*, and *MD5*.

**Auth Key:** (*text field*) Used to generate and verify the authentication field in the OSPF header. Enter an area-wide password of up to 8 alphanumeric characters for each interface in order to protect the network routers against unauthorized routing information.

**Hello Interval:** *(text field)* Hello Packets are used to verify two-way communication between neighboring routers and to synchronize their topological database. Enter the length of time, in seconds (*1-65535*), between hello packet transmissions. The default setting is *10* seconds for LAN, *30* seconds for WAN.

**Dead Interval:** *(text field)* The time that will transpire without hearing a router's Hello Packets before the router's neighbors will declare it down. Enter a value between *1-2147483647* seconds. The default setting is *30* seconds for LAN, *90* seconds for WAN.

**Transit Delay:** *(text field)* The time required to transmit a link state update over the interface. Transit delay takes transmission and propagation delays into account. Enter a value between *1-3600* seconds. The default setting is *1* second for LAN and WAN.

**Retrans Interval:** *(text field)* An OSPF router will periodically advertise the state of its router links (Interfaces), Networks, Summaries, or AS external links by sending a Link State Advertisement (LSA). Enter the length of time, in seconds (*1-3600*), between LSA transmissions. The default setting is *5* seconds for LAN and WAN.

---

## OSPF Virtual Links

An OSPF virtual link can be established that links an area to a backbone that is not physically connected to the backbone. This link provides a logical path to the backbone by way of the transit area that is established as a result of the virtual link configuration.



**NOTE:**

The two endpoints of the virtual link must always be Area Border Routers, one of which must be connected to the backbone. The virtual link must always be configured in both Area Border Routers (ABRs).

### Procedure - Configure OSPF Virtual Links

To configure the OSPF Virtual Links:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *OSPF Virtual Links* field and press **<Enter>**. The following submenu appears:

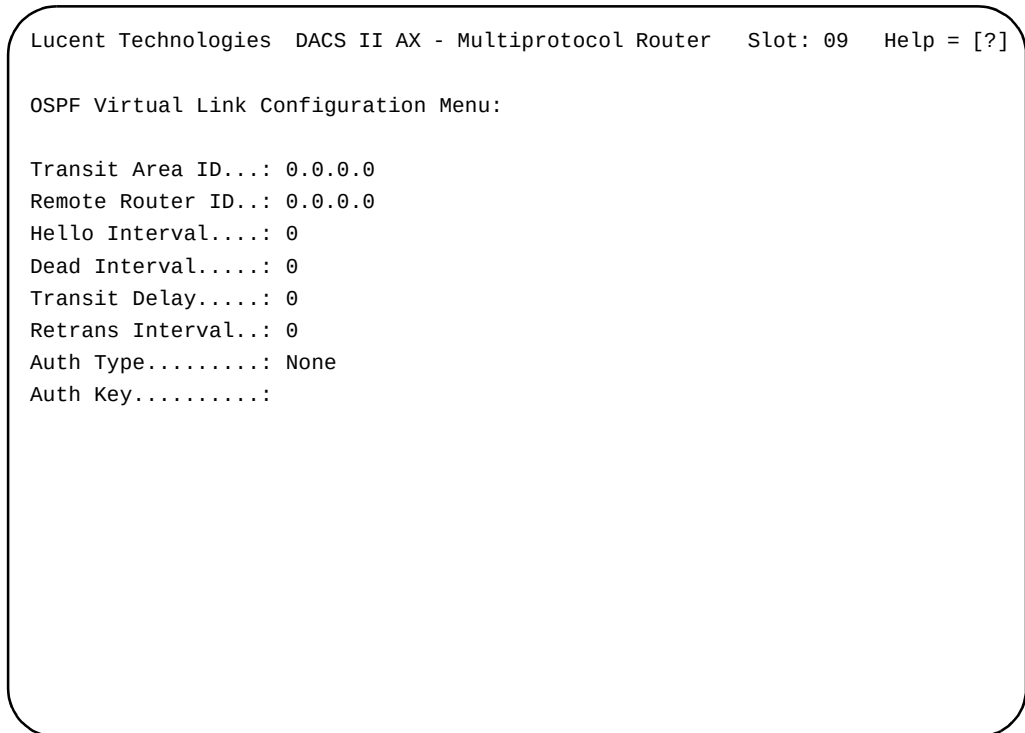
Lucent Technologies   DACS II AX - Multiprotocol Router   Slot: 09   Help = [?]

OSPF Virtual Links Configuration Menu:   Page 1 of 2

| Transit Area ID | Remote Router ID | Hello | Dead | Trans | Retrn | Auth | Key |
|-----------------|------------------|-------|------|-------|-------|------|-----|
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |
| 0.0.0.0         | 0.0.0.0          | 0     | 0    | 0     | 0     | None |     |

**Figure 20-41. OSPF Virtual Links Configuration Submenu**

2. Move your cursor to the *Transit Area ID* that you wish to configure and press **<Enter>**. The following submenu appears:



The image shows a terminal window with a rounded rectangle border. At the top, it displays 'Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]'. Below this is the title 'OSPF Virtual Link Configuration Menu:'. The menu contains several configuration options, each followed by a colon and a value: 'Transit Area ID...: 0.0.0.0', 'Remote Router ID...: 0.0.0.0', 'Hello Interval....: 0', 'Dead Interval.....: 0', 'Transit Delay.....: 0', 'Retrans Interval...: 0', 'Auth Type.....: None', and 'Auth Key.....:'. There is a large empty space below the 'Auth Key' line.

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

OSPF Virtual Link Configuration Menu:

Transit Area ID...: 0.0.0.0
Remote Router ID...: 0.0.0.0
Hello Interval....: 0
Dead Interval.....: 0
Transit Delay.....: 0
Retrans Interval...: 0
Auth Type.....: None
Auth Key.....:
```

---

**Figure 20-42. OSPF Virtual Link Configuration Entry Submenu**

3. Configure OSPF Virtual Links from here. Refer to the field descriptions on the following page.
  4. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *OSPF Virtual Link Configuration* submenu.
  5. Configure another address, or when all addresses are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.
-

**OSPF Virtual  
Links  
Configuration  
Field Descriptions**

**Transit Area ID:** *(text field)* Enter the Area ID of the area in which the virtual link is to be established.

**Remote Router ID:** *(text field)* Enter the IP address of the router that will be at the other end of the virtual link.

**Hello Interval:** *(text field)* Hello Packets are used to verify two-way communication between neighboring routers and to synchronize their topological database. Enter the length of time, in seconds (*1-65535*), between hello packet transmissions. An initial setting of 30 seconds is recommended as a starting point.

**Dead Interval:** *(text field)* The time that will transpire without hearing a router's Hello Packets before the router's neighbors will declare it down. Enter a value between *1-214748367* seconds. An initial setting of 90 seconds is recommended as a starting point.



**NOTE:**

Dead Interval should be set the same for all routers attached to a common network.

**Transit Delay:** *(text field)* The time required to transmit a link state update over the interface. Transit delay takes transmission and propagation delays into account. Enter a value between *1-3600* seconds. An initial setting of 1 second is recommended as a starting point.

**Retrans Interval:** *(text field)* An OSPF router will periodically advertise the state of its router links (Interfaces), Networks, Summaries, or AS external links by sending a Link State Advertisement (LSA). Enter the length of time, in seconds (*1-3600*), between LSA transmissions. An initial setting of 5 seconds is recommended as a starting point.

**Auth Type:** *(option field)* Select the type of authentication protocol that will be used from among *None*, *Simple*, and *MD5*.

**Auth Key:** *(text field)* Used to verify the authentication field in the OSPF header. Enter an area-wide password of up to 8 alphanumeric characters for each interface in order to guard against unauthorized routing information.

---

## OSPF Ranges Configuration

In order to combine routing information at area boundaries, area address ranges can be employed. Each address range is specified by an address/mask pair, and advertisement can either be allowed or disallowed.

### Procedure

To configure the OSPF Ranges:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *OSPF Ranges* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

OSPF Ranges Configuration Menu:

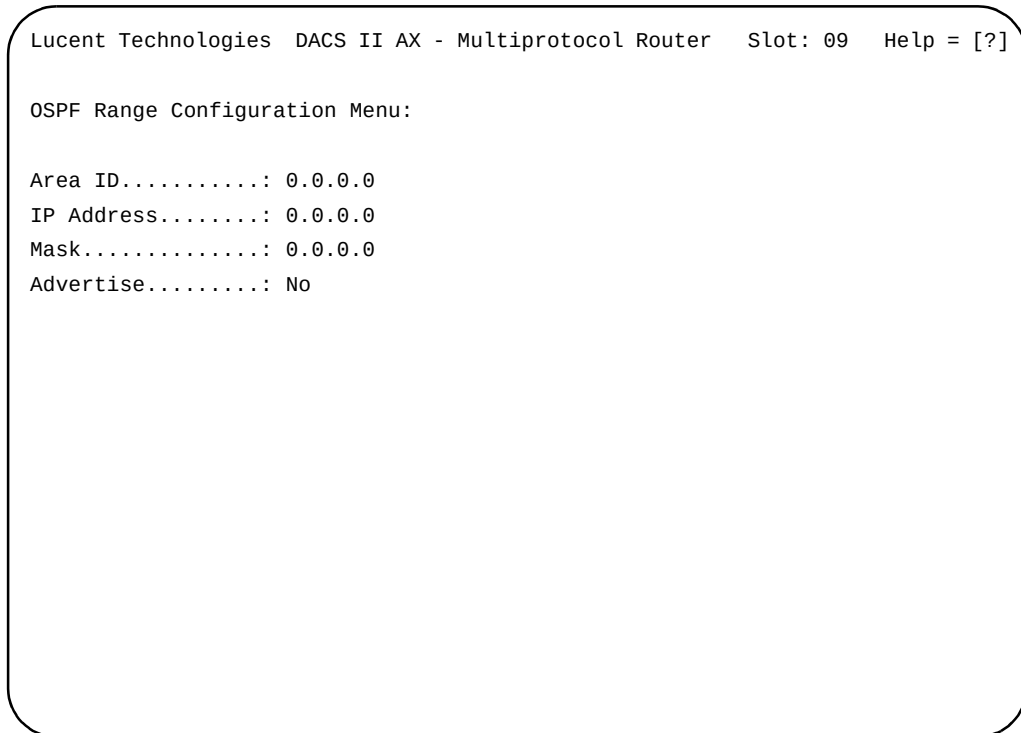
Page 1 of 2

| Area ID | IP Address | Mask    | Advertise |
|---------|------------|---------|-----------|
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |
| 0.0.0.0 | 0.0.0.0    | 0.0.0.0 | No        |

**Figure 20-43. OSPF Ranges Configuration Submenu**



1. Move your cursor to the Area ID that you wish to configure and press **<Enter>**. The following submenu appears:



```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

OSPF Range Configuration Menu:

Area ID.....: 0.0.0.0
IP Address.....: 0.0.0.0
Mask.....: 0.0.0.0
Advertise.....: No
```

---

**Figure 20-44. OSPF Range Configuration Entry Submenu**

2. Configure OSPF Ranges from here. Refer to the field descriptions on the following page.
  3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *OSPF Ranges Configuration* submenu.
  4. Configure another range, or when all ranges are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.
-

**OSPF Ranges  
Configuration  
Field Descriptions**

**Area ID:** *(text field)* An area is a group of contiguous networks and attached hosts. Each OSPF router must be configured into at least one OSPF area. Enter the Area ID of the network area.

**IP Address:** *(text field)* Enter the IP address of the OSPF range that falls within the area ID.

**Mask:** *(text field)* Indicates the range of IP addresses residing on a single IP network/subnet/supernet. The mask is generated automatically; however, it can be overridden to support subnetting. The mask is represented in "dotted decimal notation."

**Advertise:** *(option field)* When a new router is added, that router will advertise its location to neighboring routers. Selecting *Yes* allows the Router Module to advertise.

---

## OSPF Route Filters

OSPF Route Filters are used to control how much routing information is passed between OSPF and other protocols, usually between OSPF and RIP.

### Procedure - OSPF Route Filters

To configure the OSPF Route Filters:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *OSPF Route Filters* field and press **<Enter>**. The following submenu appears:

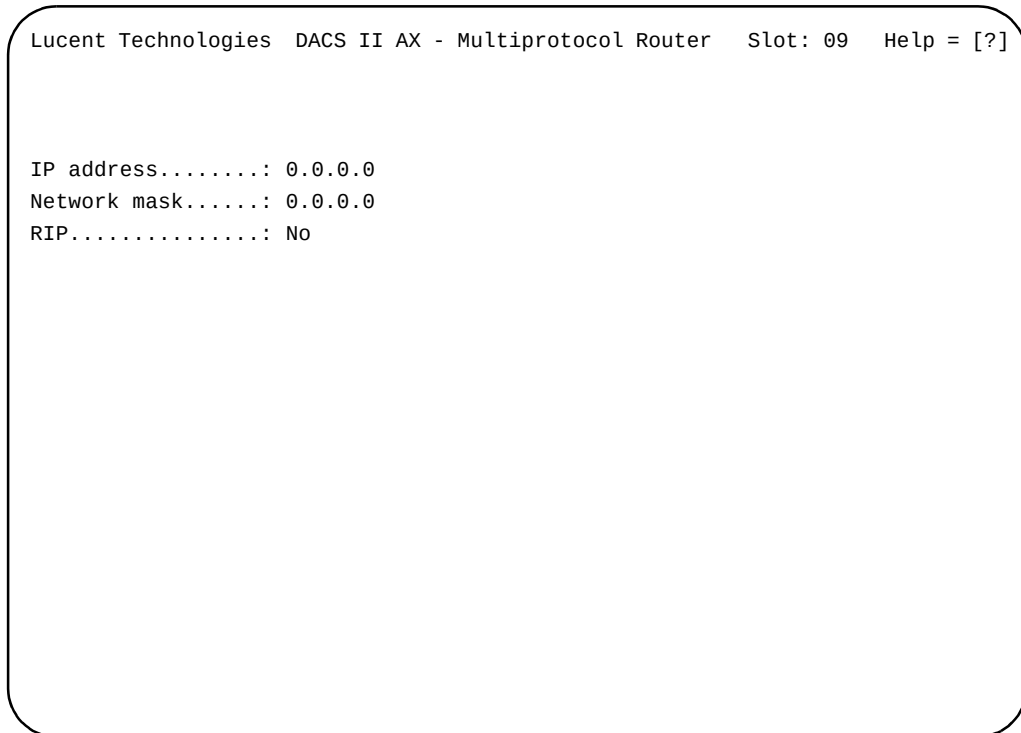
Lucent Technologies    DACS II AX - Multiprotocol Router Slot: 09    Help = [?]

Page 1 of 2

| IP Address | Mask    | RIP |
|------------|---------|-----|
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |
| 0.0.0.0    | 0.0.0.0 | No  |

**Figure 20-45. OSPF Route Filters Configuration Submenu**

2. Move your cursor to the IP address that you wish to configure and press **<Enter>**. The following submenu appears:



```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IP address.....: 0.0.0.0
Network mask.....: 0.0.0.0
RIP.....: No
```

---

**Figure 20-46. OSPF Route Filter Configuration Entry Submenu**

3. Configure OSPF Route Filters from here. Refer to the field descriptions on the following page.
  4. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *OSPF Route Filters Configuration* submenu.
  5. Configure another filter, or when all filters are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.
-

**OSPF Route Filters  
Configuration  
Field Descriptions**

**IP Address:** *(text field)* This field is used to enter the IP address of the network area to which the filter will apply.

**Network Mask:** *(text field)* The mask is generated automatically; however, it can be overridden to support subnetting. This field is used to enter the mask in "dotted decimal notation."

**RIP:** *(option field)* Selecting *Yes* will allow the OSPF routes to be translated to RIP format and exported to a RIP router for creation of a RIP routing table.

---

## RIP Route Filters

RIP Route Filters are used to control how much routing information is passed between RIP and other protocols, usually between RIP and OSPF.

### Procedure - RIP Route Filters

To configure the RIP Route Filters:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *RIP Route Filters* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Page 1 of 2

| IP Address | Mask    | OSPF |
|------------|---------|------|
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |
| 0.0.0.0    | 0.0.0.0 | No   |

Page next/prev = ['+'/'-']

Entry up/down = ['u'/'d']

Entry insert/erase = ['i'/'e']

**Figure 20-47. RIP Route Filters Submenu**

2. Move your cursor to the IP address that you wish to configure and press **<Enter>**. The following submenu appears:

Lucent Technologies      DACS II AX - Multiprotocol Router      Slot: 09      Help = [?]

IP address.....: 0.0.0.0  
Network mask.....: 0.0.0.0  
OSPF.....: No

---

**Figure 20-48. RIP Route Filter Entry Submenu**

3. Configure RIP Route Filters from here. Refer to the field descriptions on the following page.
  4. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *RIP Route Filters* submenu.
  5. Configure another filter, or when all filters are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.
-

**RIP Route Filter  
Configuration  
Field Descriptions**

**IP Address:** *(text field)* This field is used to enter the IP address of the network area to which the filter will apply.

**Network Mask:** *(text field)* The mask is generated automatically; however, it can be overridden to support subnetting. This field is used to enter the mask in dotted decimal notation.

**OSPF (Open Shortest Path First):** *(option field)* Selecting *Yes* will allow the RIP routes to be exported to an OSPF router for creation of an OSPF routing table.

---



## RIP 2

---

RIP 2 protocol is an extended version of RIP 1 protocol, implemented due to limitations in information that can be carried within RIP 1 message formats.

### Procedure - Configure RIP 2

To configure RIP 2:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *RIP 2* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]
```

```
RIP 2 menu...
```

```
RIP 2.....: Off
```

```
RIP 2 Multicast.: Off
```

---

**Figure 20-49. RIP 2 Submenu**

2. After first enabling IP RIP from the Logical Port Parameters submenu, enable and configure RIP 2 from this submenu. Refer to the field descriptions on the following page.
  3. Once changes are made to the appropriate fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *IP and OSPF Configuration* submenu.
  4. Configure another filter, or when all filters are configured, press **X** to save changes and return to the *IP and OSPF Configuration* submenu.
-

**RIP Route Filter  
Configuration  
Field Descriptions**

**RIP 2:** (*option field*) Selecting *Yes* enables RIP 2 protocol.

**RIP 2 Multicast:** (*option field*) Selecting *Yes* enables RIP 2 Multicast. Multicast allows data packets to be transmitted from a single sender to a group of selected users at the same time.

---

## IPX SAP Filters

This parameter is used to choose an IPX SAP filter to associate with the logical port. Up to 14 IPX SAP filters can be configured. When selected, the IPX SAP Filter Selection screen is presented.

### Procedure - Configure IPX SAP Filter

To configure an IPX SAP Filter for a logical port:

1. From the *Configuration Menu*, place your cursor on the *IPX SAP Filters* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IPX SAP Filter selection menu... Page 1 of 1

Filter name Comment
SAP FILTER BLOCKING SERVERS

Page up/down = ['+'/'-']
Add filter = ['a'/'A']
Erase filter = ['e'/'E']
```

**Figure 20-50. IPX SAP Filter Selection Submenu**

The *Filter Selection* submenu displays a list of all currently saved filters. No indication is given here as to whether or not a particular filter is actually in use. Association of a named filter with a logical port is performed from the *Logical Port Configuration* submenu. This submenu is used to configure a new or saved filter or to erase a saved filter. It is also the place to set the IP address to which syslog messages will be sent for any filters that invoke this reaction.



**NOTE:**

The IPX SAP filtering feature is a powerful one, and should be used carefully. It is necessary to have detailed knowledge of networking protocols in order to set up a useful filter.

**Procedure -  
Configure New  
IPX SAP Filter**

To configure a New IPX SAP Filter:

1. From the *IPX SAP Filter Selection* submenu, press **A** or move your cursor to an empty line and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IPX SAP filter configuration menu... Page 1 of 1

Name: Comment:

Page up/down = [ '+'/' '-' ]  
Rule up/down = [ 'u'/'d' ]  
Rule insert/erase = [ 'i'/'e' ]

**Figure 20-51. IPX SAP Filter Configuration Submenu**

2. The *IPX SAP Filter Configuration* submenu displays a summary line for each rule of the filter that is being configured. *The filter must be named before configuration of any rules can be performed.* Enter a visible and valid name in the *Name* field. A comment can be entered in the *Comment* field if desired. The comment will be visible later when associating a filter with a logical port.

3. To configure a single rule, move your cursor to the corresponding line and press **<Enter>**.
4. To insert a new rule in between two rules, press **I**.
5. To erase a rule, move your cursor to the corresponding line and press **E**.



**NOTE:**

The last line on the filter must have a PASS rule configured in order for the filter to work properly.

---

**Procedure -  
Configure Saved  
IPX SAP Filter**

To Configure a Saved IPX SAP Filter:

1. From the *IPX SAP Filter Selection* submenu, move your cursor to the corresponding line and press **<Enter>**.



**NOTE:**

The last line on the filter must have a PASS rule configured in order for the filter to work properly.

**Procedure -Erase  
IPX SAP Filter**

To erase a saved IPX SAP Filter:

1. From the *IPX SAP Filter Selection* submenu, move your cursor to the corresponding line and press **E**.

**Procedure -  
Configure Single  
Rule**

To configure a Single Rule:

1. Move your cursor to the corresponding line and press **<Enter>**.

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IPX SAP filter, single rule configuration menu...

Filter name.....:
Comment.....:
Reaction.....: none
Server name.....:
IPX network address.....: 00000000
IPX node address.....: 0:0:0:0:0:0
IPX socket comparator.....:
IPX socket.....: 0
```

**Figure 20-52. IPX SAP Filter Single Rule Configuration Submenu**

2. Move your cursor to the *Reaction* field to set what will happen when a frame is filtered. Press **<Enter>** to toggle through the possible reactions.

3. Place your cursor on the appropriate filter field and press **<Enter>** to configure the IPX SAP filter.

---

**IPX SAP Filter  
Single Rule  
Configuration  
Field Descriptions**

**Filter Name and Comment:** These two fields are read-only and cannot be modified from this screen.

**Reaction:** (*option field*) This field controls how the filter handles data. *Block*, *Pass*, and *None* are the available selections.

**Server Name:** (*text field*) To filter a frame based on server name, enter the server name here.

**IPX Network Address:** (*text field*) To filter a frame based on IPX network number, enter the network number here.

**IPX Node Address:** (*text field*) To filter a frame based on IPX Server MAC Address, enter the server's MAC address here.

**IPX Socket Comparator:** (*option field*) Select **<**, **<=**, **=**, **>**, **>=**, or **<>** to filter a frame based on a comparison with the IPX Socket number entered in the following field.

**IPX Socket:** (*text field*) To filter a frame based on a comparison to the IPX Socket Number, enter the socket number here.

---

## **DHCP Server**

---

The DHCP (Dynamic Host Configuration Protocol) Server Menu allows the router module to be set up as a DHCP Server.

DHCP is a "plug-'n-play" facilitator that operates as an automated network administrator. It works with devices on a LAN that are designed to interface to the DHCP server. Such devices are called DHCP Clients. DHCP Clients must meet the requirements of interfacing to the DHCP Host with a protocol that is defined in Reference Documents RFC-2131 and RFC-2132.

Before DHCP was available, a network administrator had to manually assign a temporary IP address to a visiting client in order to grant it access to the Local Area Network. When the client was moved, or had logged off, the Network Administrator had to manually free up the IP address by removing it from the IP address table in the server. DHCP offers a way to administer dynamic network configuration with minimal human intervention. DHCP also offers a management tool whereby Server-Client activity can be audited and monitored.

The DHCP Server is not designed to implement Boot-P server functions. A full Boot-P server is technically obsolete because DHCP clients are stand-alone systems with their own memory, hard-drive, and operating systems. Boot-P was used in the past when RAM and hard disk drives were prohibitively expensive.

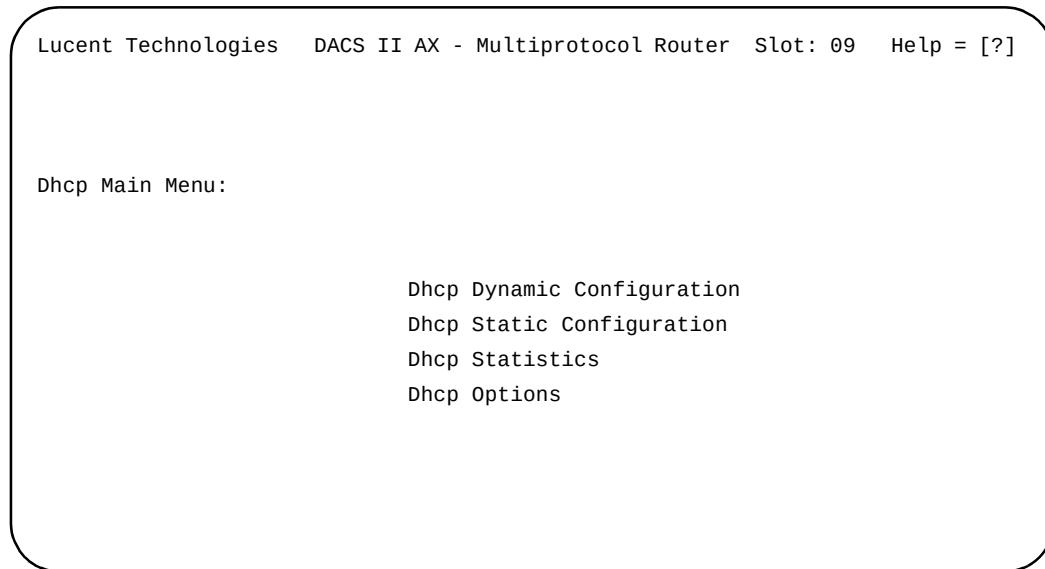
---



**Procedure -  
Configure DHCP  
Server**

To configure the DHCP Server:

1. From the *Configuration Menu*, place your cursor on the *DHCP Server* field and press **<Enter>**. The following submenu appears:



---

**Figure 20-53. DHCP Main Menu**

From the *DHCP Main Menu* you can:

- Perform DHCP Dynamic Configuration
- Perform DHCP Static Configuration
- View Statistics, including DHCP Pool and Used IP Statistics
- Enable DHCP Options such as Netbios Node Type, Netbios Scope and Netbios Name Server, along with enabling DHCP itself.

---

**Before You Begin**

Go to the *DHCP Options* menu and ensure that DHCP is enabled, otherwise the other menu selections will not function. In this chapter, refer to *Procedure - Enable DHCP and Set Up Options*.

---

**Procedure - DHCP Dynamic Configuration** To perform DHCP dynamic configuration:



**NOTE:**

You must first go to the DHCP Options menu and ensure that DHCP is enabled, otherwise you will not be able to access the DHCP Server Dynamic Configuration Menu.

1. From the *DHCP Main Menu*, place your cursor on the *DHCP Dynamic Configuration* field and press **<Enter>**. The following submenu appears:

```

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

DHCP Server Dynamic Configuration Menu...

 Page 1 of 1

Network Name 1st Ip Address GateWay Subnet Mask
Mynet 10.52.244.0 128.0.0.1 253.255.255.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0
:..... 0.0.0.0 0.0.0.0 0.0.0.0

 Page next/prev = ['+'/'-']

```

**Figure 20-54. DHCP Server Dynamic Configuration Menu**

2. From the *DHCP Server Dynamic Configuration Menu*, place your cursor on the network you wish to configure and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

DHCP Server Pool Configuration Menu:

Network Name.....: Mynet
First IP Address.....: 10.52.244.137
Last IP Address.....: 10.52.244.145
Gateway IP Address...: 128.0.0.1
Sub Network Mask.....: 255.255.255.0
Lease Time In Second.: 21600
```

---

**Figure 20-55. DHCP Server Pool Configuration Menu**

3. From the *DHCP Server Pool Configuration Menu*, you can configure the DHCP Server Pool by scrolling to the field which you wish to configure and pressing **<Enter>**. Input the information, then press **<Enter>** again to store.
4. Once the fields have been configured, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *DHCP Server Dynamic Configuration Menu*.



**NOTE:**

All mandatory fields must be filled in. Any missing or incorrect information will result in an error message informing you which field is missing the information. Pressing any key will return you to the DHCP Server Dynamic Configuration Menu, and you will need to re-select the network and re-enter the correct information.

---

**DHCP Server Pool  
Configuration  
Field Descriptions**

**Network Name:** *(Text field)* This field is used to input the name of the selected network. Enter up to 14 alphanumeric characters. This is a mandatory field.

**First IP Address:** *(Text field)* This field is used to enter the first IP address within the pool in "dotted decimal notation". This is a mandatory field.

**Last IP Address:** *(Text field)* This field is used to enter the last IP address within the pool in "dotted decimal notation". The last IP address in the pool must be greater than the first global address. This is a mandatory field.

**Gateway IP Address:** *(Text field)* This field is used to enter the Gateway IP address in "dotted decimal notation". This is a mandatory field.

**Sub Network Mask:** *(Text field)* This field is used to enter the subnet mask in "dotted decimal notation". This is a mandatory field.

**Lease Time in Second:** *(Text field)* This field is used to enter the time, in seconds, for which the lease on an IP address can continue. If the DHCP Server is configured to renew leases at sign-on, the IP address leases can be renewed when a client computer is "turned on". When this time expires and the lease has not been renewed, the IP address will be returned to the pool. The default time is 600 seconds.

---

**Procedure - DHCP Static Configuration** To perform DHCP static configuration:



**NOTE:**

You must first go to the DHCP Options menu and ensure that DHCP is enabled, otherwise you will not be able to access the DHCP Server Static Configuration Menu.

1. From the *DHCP Main Menu*, place your cursor on the *DHCP Static Configuration* field and press **<Enter>**. The following submenu appears:

```

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

DHCP Server Static Configuration Menu...
 Page 1 of 3

Host Name Ip Address Mac Address
My Router 10.52.244.138 0:52:24:AB:CD:EF
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0
:..... 0.0.0.0 0:0:0:0:0:0

 Page next/prev = ['+'/'-']

```

**Figure 20-56. DHCP Server Static Configuration Menu**

2. From the *DHCP Server Static Configuration Menu*, place your cursor on the host you wish to configure and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]
```

```
DHCP Server Pool Configuration Menu:
```

```
IP Address.....: 10.52.244.138
Gateway IP Address...: 128.0.0.1
Sub Network Mask.....: 255.255.0.0
Host Name.....: My Router
Mac Address.....: 0:52:24:AB:CD:EF
```

---

**Figure 20-57. DHCP Server Pool Configuration Menu**

3. From the *DHCP Server Pool Configuration Menu*, you can configure the DHCP Server Pool by scrolling to the field which you wish to configure and pressing **<Enter>**. Input the information, then press **<Enter>** again to store.
4. Once the fields have been configured, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *DHCP Server Static Configuration Menu*.



**NOTE:**

All mandatory fields must be filled in. Any missing or incorrect information will result in an error message informing you which field is missing the information. Pressing any key will return you to the DHCP Server Static Configuration Menu, and you will need to re-select the host and re-enter the correct information.

---

**DHCP Server Pool  
Configuration  
Field Descriptions**

**IP Address:** *(Text field)* This field is used to enter static IP address within the pool in "dotted decimal notation". This is a mandatory field.

**Gateway IP Address:** *(Text field)* This field is used to enter the Gateway IP address in "dotted decimal notation". This is a mandatory field.

**Sub Network Mask:** *(Text field)* This field is used to enter the subnet mask in "dotted decimal notation". This is a mandatory field.

**Host Name:** *(Text field)* This field is used to enter the host name, if known. This is an optional field.

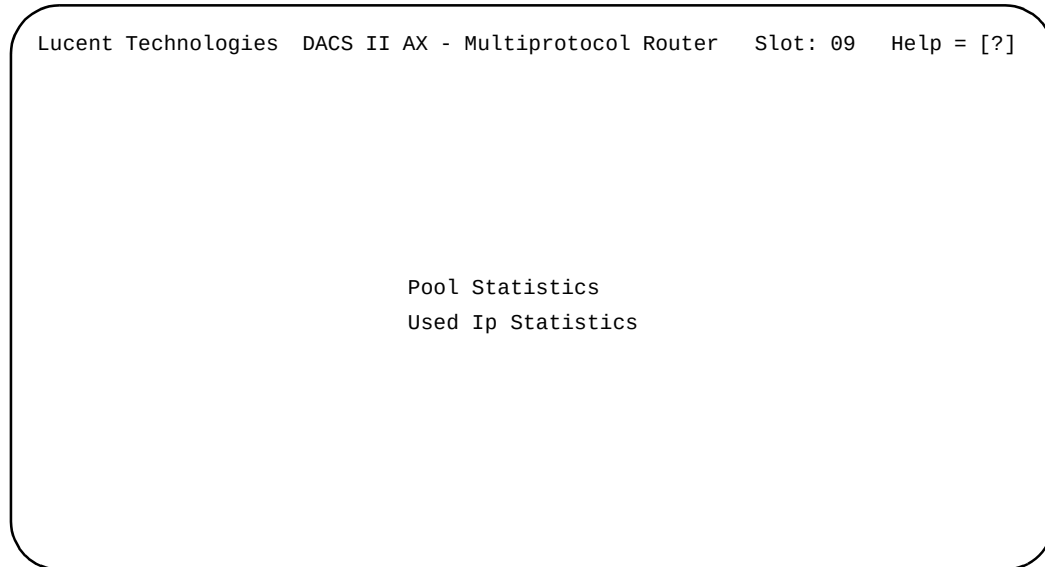
**Mac Address:** *(Text field)* This field is used to enter the MAC address of the interfacing equipment. This is a mandatory field.

---

**Procedure - View  
DHCP Pool  
Statistics**

To view DHCP pool statistics:

1. From the *DHCP Main Menu*, place your cursor on the *DHCP Statistics* field and press **<Enter>**. The following submenu appears:



---

**Figure 20-58. DHCP Statistics Submenu**



2. From the *DHCP Statistics* submenu, place your cursor on the *Pool Statistics* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

DHCP Pool Statistics

Network Name 1st Local Address
MyNet #1 10.52.244.130
MyNet #2 10.52.244.137
```

**Figure 20-59. DHCP Pool Statistics Submenu**

3. From the *DHCP Pool Statistics* submenu, place your cursor on the network name for which you wish to view statistics and press **<Enter>**. The following display appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Network Name.....: MyNet #1
Total.....: 0008
Available.....: 0007
```

**Figure 20-60. DHCP Pool Statistics Display**

The *DHCP Pool Statistics Display* is a read-only screen. Information contained in each field on the screen is detailed on the following page.

**DHCP Pool  
Statistics Display  
Field Descriptions**

**Network Name:** This field displays the name of the selected network.

**Total:** This field displays the total number of addresses in the Dynamic Address Pool.

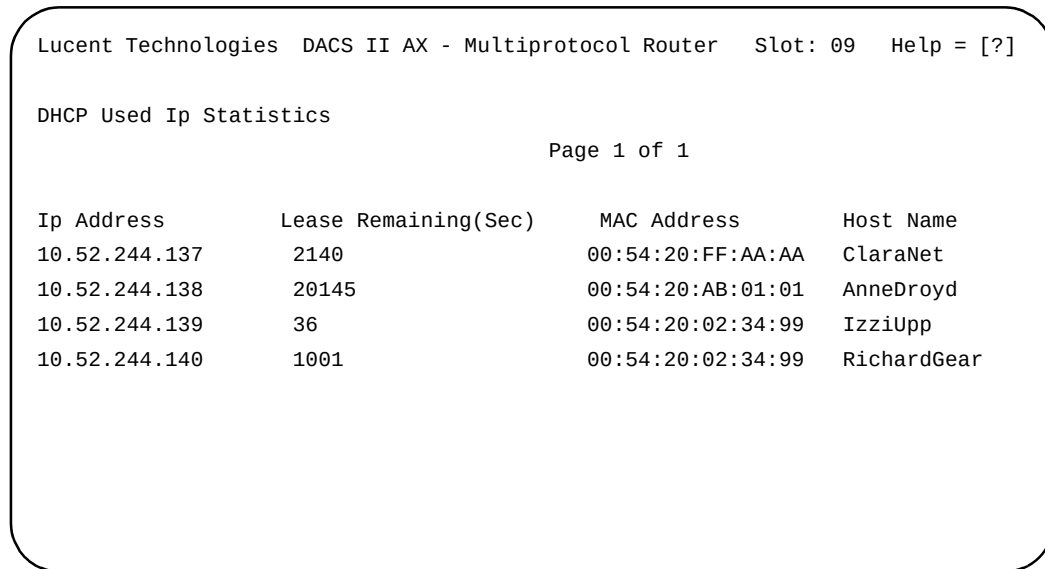
**Available:** This field displays the number of available addresses in the Dynamic Address Pool.

---

**Procedure - View  
DHCP Used IP  
Statistics**

To view DHCP Used IP Statistics:

1. From the *DHCP Main Menu*, place your cursor on the *DHCP Statistics* field and press **<Enter>**. The DHCP Statistics submenu (figure 19-59) appears.
2. From the *DHCP Statistics* submenu, place your cursor on the *Used Ip Statistics* field and press **<Enter>**. The following submenu appears:



Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

DHCP Used Ip Statistics

Page 1 of 1

| Ip Address    | Lease Remaining(Sec) | MAC Address       | Host Name   |
|---------------|----------------------|-------------------|-------------|
| 10.52.244.137 | 2140                 | 00:54:20:FF:AA:AA | ClaraNet    |
| 10.52.244.138 | 20145                | 00:54:20:AB:01:01 | AnneDroyd   |
| 10.52.244.139 | 36                   | 00:54:20:02:34:99 | IzziUpp     |
| 10.52.244.140 | 1001                 | 00:54:20:02:34:99 | RichardGear |

**Figure 20-61. DHCP Used Ip Statistics Display**

The *DHCP Used Ip Statistics Display* is a read-only screen. Information contained in each field on the screen is detailed on the following page.

**DHCP Used IP  
Statistics Display  
Field Descriptions**

**Ip Address:** This field displays the IP addresses that are currently being used.

**Lease Remaining (Sec):** This field displays the number of seconds remaining on the lease.



**NOTE:**

This is not a dynamic display, so the lease times do not decrement. Since the time remaining on leases is updated only upon entering the menu, updates can only be obtained by exiting the display and re-entering.

**MAC Address:** This field displays the MAC address of the interfacing equipment.

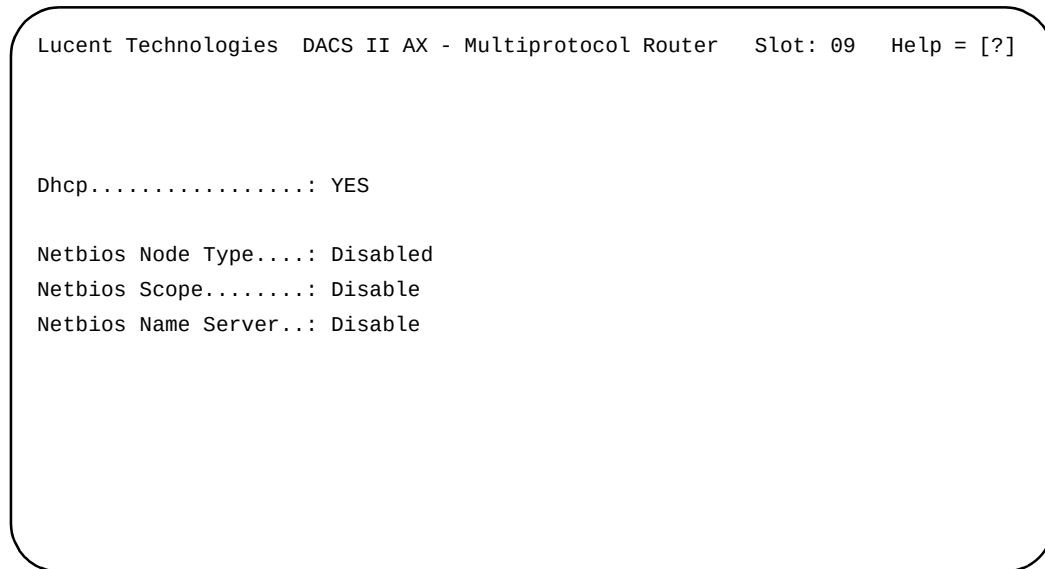
**Host Name:** This field displays the host name.

---

**Procedure - Enable  
DHCP and Set Up  
Options**

To enable DHCP and set up DHCP options:

1. From the *DHCP Main Menu*, place your cursor on the *DHCP Options* field and press **<Enter>**. The following submenu appears:



```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Dhcp.....: YES

Netbios Node Type....: Disabled
Netbios Scope.....: Disable
Netbios Name Server...: Disable
```

---

**Figure 20-62. DHCP Options Submenu**

From the DHCP Options Submenu, you can enable DHCP as well as configure several option settings. These settings are described on the following page.

---

## DHCP Option Field Descriptions

**DHCP:** (*option field*) Select *Yes* to enable the DHCP Server. Otherwise, DHCP Dynamic and Static Configuration is not possible.

**Netbios Node Type:** (*option field*) This field controls the type of Netbios Node. Choose from one of the following:

- **Disabled:** Disables the Netbios Node.
- **B-Node:** The most basic mode of operation. Name registration and discovery algorithms use broadcast messages by querying every system for name resolution. This method does have a disadvantage - it can cause congestion on the network.
- **P-Node:** (Point-to-Point Node) This is used when the network administrator wants to cut the amount of broadcast activity of NetBios operations that would occur in B-Mode. P-Nodes use only UDP messaging and TCP sessions directed at a centralized NetBios Name Server (NBNS) or WINS Server. Broadcast UDP/TCP is not supported in a P-Node.
- **M-Node:** (Mixed Node) M-Nodes are of type P which have been given some B-type characteristics. M-nodes use broadcast and unicast UDP messaging. An M-node must have the services of a NetBios Name Server, via NetBios Distributed Datagram server. Pure B and P Nodes do not interact; the type B and type M-Nodes can be mixed only on a local broadcast area.



**NOTE:**  
DO NOT use B and M node types in an Internet application.

- **H-Node:** (Hybrid Node) P-node is tried first, then switches over to B-Node operation.

**Netbios Scope:** (*option field*) Enables you to *Enable* or *Disable* NetBios Scope, as well as assign a name to the population of computers on the network. See the Enable and Configure NetBios Scope procedure on the following page.

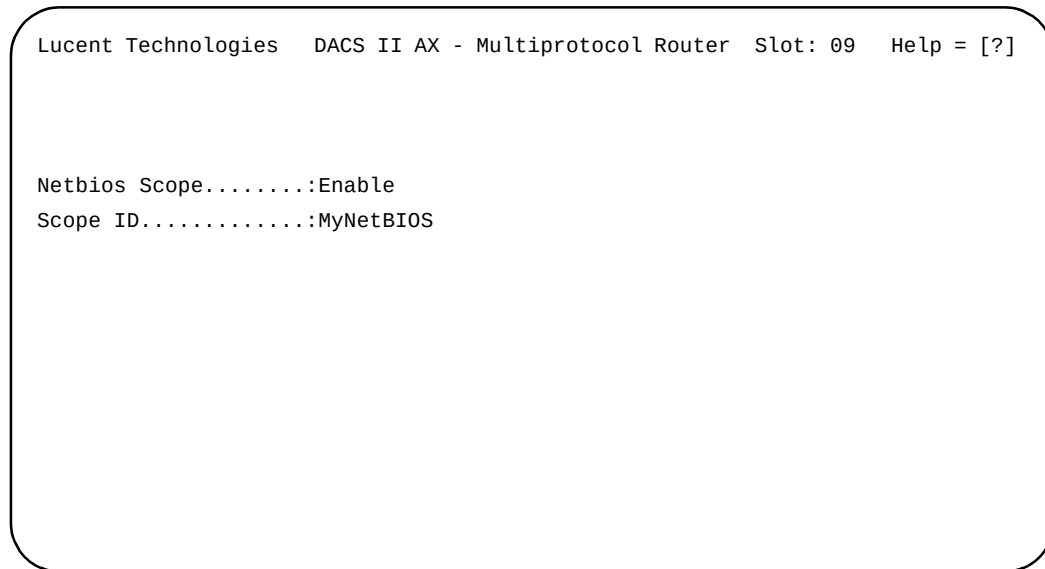
**Netbios Name Server:** (*option field*) Enables you to *Enable* or *Disable* the NetBios Name Server, as well as assign IP addresses to the primary and secondary WINS (Windows Internet Naming Service) Servers. See *Procedure - NetBios Name Server*.

---

## Procedure - NetBios Scope

To enable and configure NetBios Scope:

1. From the *DHCP Main Menu*, place your cursor on the *DHCP Options* field and press **<Enter>**. The *DHCP Options* submenu (figure 19-63) appears.
2. From the *DHCP Options* submenu, place your cursor on the *Netbios Scope* field and press **<Enter>**. The following submenu appears:

A screenshot of a terminal window showing the 'Netbios Scope Configuration Submenu'. The title bar at the top reads 'Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]'. The main content area displays two configuration options: 'Netbios Scope.....:Enable' and 'Scope ID.....:MyNetBIOS'.

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Netbios Scope.....:Enable
Scope ID.....:MyNetBIOS
```

**Figure 20-63. Netbios Scope Configuration Submenu**

3. From the *Netbios Scope Configuration* submenu, move your cursor to the *Netbios Scope* field and press **<Enter>** to *Enable* Netbios Scope.
4. Move your cursor to the *Scope ID* field and press **<Enter>**, then type in a name of up to 14 alphanumeric characters. Press **<Enter>** again to store.
5. Once changes are made to both fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *DHCP Options* submenu.

**Procedure -  
NetBios Name  
Server**

To enable and configure NetBios Name Server:

1. From the *DHCP Main Menu*, place your cursor on the *DHCP Options* field and press **<Enter>**. The *DHCP Options* submenu (figure 19-63) appears.
2. From the *DHCP Options* submenu, place your cursor on the *Netbios Name Server* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]
```

```
Netbios Name Server...:Enable
Pri WINS Server IP...:10.52.244.1
Sec WINS Server IP...:0.0.0.0
```

**Figure 20-64. Netbios Name Server Configuration Submenu**

3. From the *Netbios Name Server Configuration* submenu, move your cursor to the *Netbios Name Server* field and press **<Enter>** to *Enable* the Netbios Name Server.
4. Move your cursor to the *Pri WINS Server IP* field and press **<Enter>**, then type in the address of the Primary WINS (Windows Internet Naming Service) server in "dotted decimal notation". Press **<Enter>** again to store.
5. If a secondary WINS Server is not available, leave the IP address at the default setting of 0.0.0.0. Otherwise, move your cursor to the *Sec WINS Server IP* field and press **<Enter>**, then type in the address of the Secondary WINS Server in "dotted decimal notation". Press **<Enter>** again to store.

Once changes are made to all fields, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *DHCP Options* submenu.



## Statistics Menu

The Statistics Menu provides access to three submenus from which Channelized Router Hub statistics can be viewed.

The Statistics Menu structure is illustrated below.

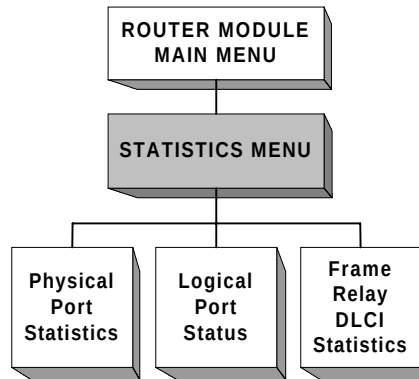


**Figure 20-65. Statistics Menu Structure**

### Procedure

To View Statistics for the Router Module:

1. From the *Main Menu*, select *Statistics* field . Select one of the options from the Statistics menu (Figure 20-66).

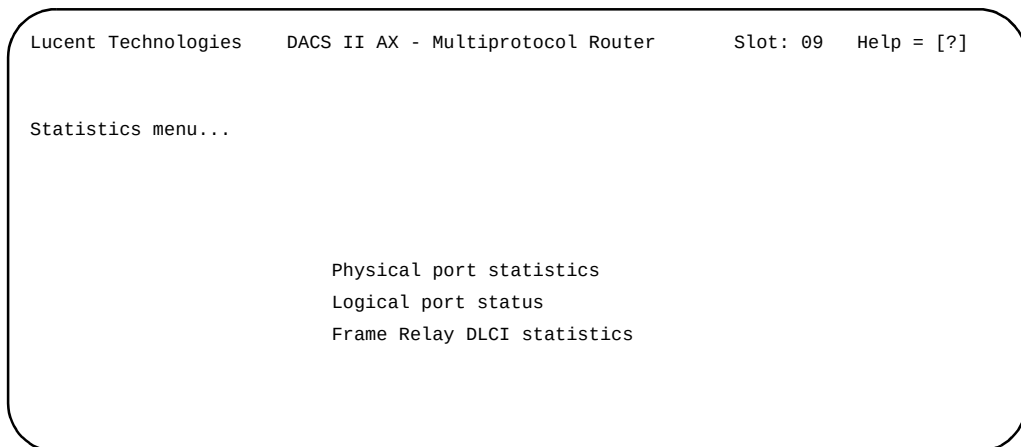


**Figure 20-66. Statistics Menu**

## Physical Port Statistics

### Procedure

To View Statistics for the Physical Port:

1. From the *Statistics Menu*, move your cursor to the *Physical Port Statistics* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

Physical port statistics...
LAN port status: Physical address: [00:20:54:30:00:07]
Transmitted frames.: 7591 Received frames.: 193825
Transmit discards.: 0 Receive discards: 1
Transmit errors....: 0 Receive errors...: 0
Transmit collisions: 0 Filtered frames.: 0
 Forwarded frames: 23908

WAN port status:
Virtual Port.....: WAN 1

Port state.....: Out of service
WAN protocol.....: PPP Management mode....: ANSI T1.617D
Transmitted frames.: 151843 Network/User mode..: User
Transmit errors....: 0 Received FECN.....: 0
Received frames....: 75921 Received BECN.....: 0
Receive errors....: 0

Reset counters = ['R']
```

**Figure 20-67. Physical Port Statistics Submenu**

2. Within the *Physical Port Statistics* submenu, the only operator interaction available is either selecting between the WAN Virtual Ports by pressing **<Enter>** or **B**, or resetting the counters by pressing **R**.

## Physical Port Statistics Display Field Descriptions

---

### LAN Port Status Parameters

**Transmitted Frames:** This field displays the number of frames that this interface has forwarded to the LAN since the last time the counters were reset.

**Transmit Discards:** This field displays the number of frames that could not be transmitted due to errors or memory limitations since the last time that the counters were reset.

**Transmit Errors:** This field displays the number of times the maximum transmit collisions were reached since the last time that the counters were reset.

**Transmit Collisions:** This field displays the number of transmit collisions since the last time that the counters were reset.

**Physical Address:** This is the Ethernet (MAC) address of the LAN interface.

**Received Frames:** This field displays the number of frames that this interface has received from the LAN since the last time that the counters were reset. The bridge examines the destination addresses of these frames and the frame is either forwarded or filtered.

**Receive Discards:** This field displays the number of received frames that were discarded because of errors or memory limitations since the last time that the counters were reset.

**Receive Errors:** This field displays the number of frames received with CRC or alignment errors since the last time that the counters were reset.

**Filtered Frames:** This field displays the number of received frames that were filtered since the last time that the counters were reset.

**Forwarded Frames:** This field displays the number of frames transmitted to another interface since the last time that the counters were reset.

---

### WAN Port Status Parameters

These parameters allow you to view statistic parameters on the WAN ports.

**Virtual Port:** (*option field*) This parameter allows you to select the virtual port for which you wish to view statistics (WAN 1 through WAN 32) by pressing the <Enter> key.

**Port State:** This field displays the state of the WAN interface. *In Service* means the link is operational and valid frames are being received. *Out of Service* means

that the port is not being used, that is, it has been set to OOS for the purpose of eliminating alarms. A series of question marks (?????????????) means the port has not been configured.

**WAN Protocol:** This field displays which protocol is being used (Point-to-Point or Frame Relay) on the WAN interface. (Refer to the *WAN Configuration* submenu for a description of each of the protocols or to change the protocol.)

**Transmitted Frames:** This field displays the number of frames this interface transmitted to the WAN since the last time the counters were reset.

**Transmit Errors:** This field displays the number of frames this interface transmitted with errors since the last time the counters were reset.

**Received Frames:** This field displays the number of frames this interface received from the WAN since the last time the counters were reset.

**Receive Errors:** This field displays the number of frames received with CRC or alignment errors since the last time the counters were reset.

**Management Mode:** This field displays the Frame Relay management mode being used (*ANSI T1.617D*, *CCITT*, *Q.933A* or *LM*). To change the mode, refer to the *WAN Configuration* submenu.

**Network/User Mode:** This field displays the state of the module. It is either in the *Network* mode (point-to-point and/or test applications) or the *User* mode (connected to a carrier with a switch).

**Received FECN (Forward Explicit Congestion Notification):** This field displays the number of frames received with a Forward Explicit Congestion Notification since the last time the counters were reset.

**Received BECN (Backward Explicit Congestion Notification):** This field displays the number of frames received with a Backward Explicit Congestion Notification since the last time the counters were reset.

---

## Logical Port Status

The *Logical Port Status* display provides a listing of every “configured” logical port. Each screen summarizes 32 logical ports. If more than 32 logical ports have been configured, the screen will automatically show the status of the remaining ports when it refreshes itself (every 10 seconds). Once all of the configured ports have been displayed, the module will start to re-display the ports, starting at 0. You cannot page down on this submenu; the module will automatically page through the configured ports for you.

### Procedure

To View Statistics for the Logical Ports:

1. From the *Statistics Menu*, move your cursor to the *Logical Port Status* field and press **<Enter>**. The following display appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]
```

Logical port status...

| Protocol    | Port   | DLCI | Status   | Protocol | Port   | DLCI | Status   |
|-------------|--------|------|----------|----------|--------|------|----------|
| -----       | -----  | ---- | -----    | -----    | -----  | ---- | -----    |
| Ethernet    | LAN    | ---- | Active   | PPP      | WAN 16 | ---- | Inactive |
| Frame Relay | WAN 1  | 0000 | Inactive | PPP      | WAN 17 | ---- | Inactive |
| PPP         | WAN 2  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 3  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 4  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 5  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 6  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 7  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 8  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 9  | ---- | Inactive |          |        |      |          |
| PPP         | WAN 10 | ---- | Inactive |          |        |      |          |
| PPP         | WAN 11 | ---- | Inactive |          |        |      |          |
| PPP         | WAN 12 | ---- | Inactive |          |        |      |          |
| PPP         | WAN 13 | ---- | Inactive |          |        |      |          |
| PPP         | WAN 14 | ---- | Inactive |          |        |      |          |
| PPP         | WAN 15 | ---- | Inactive |          |        |      |          |

**Figure 20-68. Logical Port Status Display**

2. The *Logical Port Status* display is a read-only screen. Information contained in each field on the screen is detailed on the following page.

**Logical Port Status  
Field Descriptions**

**Protocol:** This field identifies the protocol that has been configured for the logical port. For LAN interfaces it will be *Ethernet*. For WAN interfaces, it will be *PPP*, *Multilink*, *PPP/LAPB*, *Multilink/LAPB*, or *Frame Relay*.

**Port:** A numerical field which identifies each physical port (*LAN*, *WAN 1*, *WAN 2*, etc), as configured on the *Logical Port Configuration* submenu.

**DLCI:** This field identifies the DLCI to be used (*16-1023*), and is only relevant for WAN ports running Frame Relay. For the LAN port interface and WAN ports not running Frame Relay, this field will always be displayed as empty (----).

**Status:** This field tells you whether the port is active (traffic is able to be routed over it) or inactive (no traffic is able to be routed over it).

---

## Frame Relay DLCI Statistics

From this screen, you can view the Frame Relay DLCI statistics for each WAN port running frame relay.

### Procedure

To View the Frame Relay DLCI Statistics:

1. From the *Statistics Menu*, place your cursor on the *Frame Relay DLCI Statistics* field and press **<Enter>**. The following display appears:

Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

DLCI statistics...

| WAN | DLCI | Rcv BECN | Rcv FECN | Sent Pkts | Sent Bytes | Rcv Pkts | Rcv Bytes |
|-----|------|----------|----------|-----------|------------|----------|-----------|
| 1   | 16   | 100      | 160      | 1826      | 1975       | 1830     | 1960      |

Page up/down = ['+'/'-']

**Figure 20-69. DLCI Statistics Display**

2. The *DLCI Statistics* display is a read-only screen. Information contained in each field on the screen is detailed on the following page.

**Frame Relay DLCI  
Statistics Field  
Descriptions**

**WAN:** Displays the Wide Area Network Port on which statistics are being reported (currently only WAN 1).

**DLCI:** The DLCI number is embedded in the Frame Relay Header. Each DLCI represents an independent data channel that can appear on a WAN Port.

**Rcv BECN (Backward Explicit Congestion Notification):** This indicates the congestion level at the receiver on the remote end of the DLCI connection.

**Rcv FECN (Forward Explicit Congestion Notification):** This indicates to the congestion level in the transmitting path to the remote end of the DLCI connection.

**Sent Pkts:** The total number of packets sent.

**Sent Bytes:** The total number of bytes sent in the sent packets.

**Rcv Packets:** The total number of packets received.

**Rcv Bytes:** The total number of bytes received in the received packets.

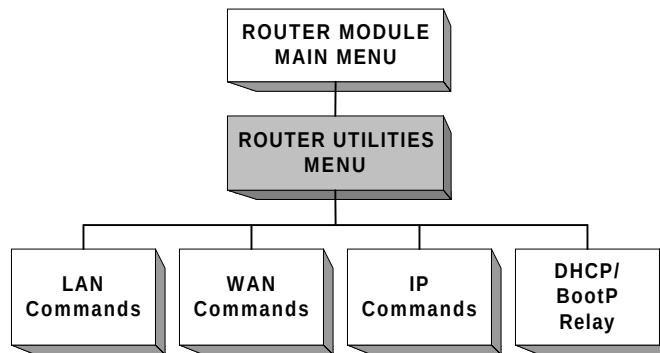
---



## Router Utilities Menu

---

The Router Utilities Menu provides access to several submenus through which you can access router-specific utilities. The Router Utilities Menu structure is illustrated below.



---

**Figure 20-70. Router Utilities Menu Structure**

## Procedure

To Access the Router Utilities Menu:

1. From the *Main Menu*, select *Router Utilities*. The Router Utilities Menu displays (Figure 20-71).

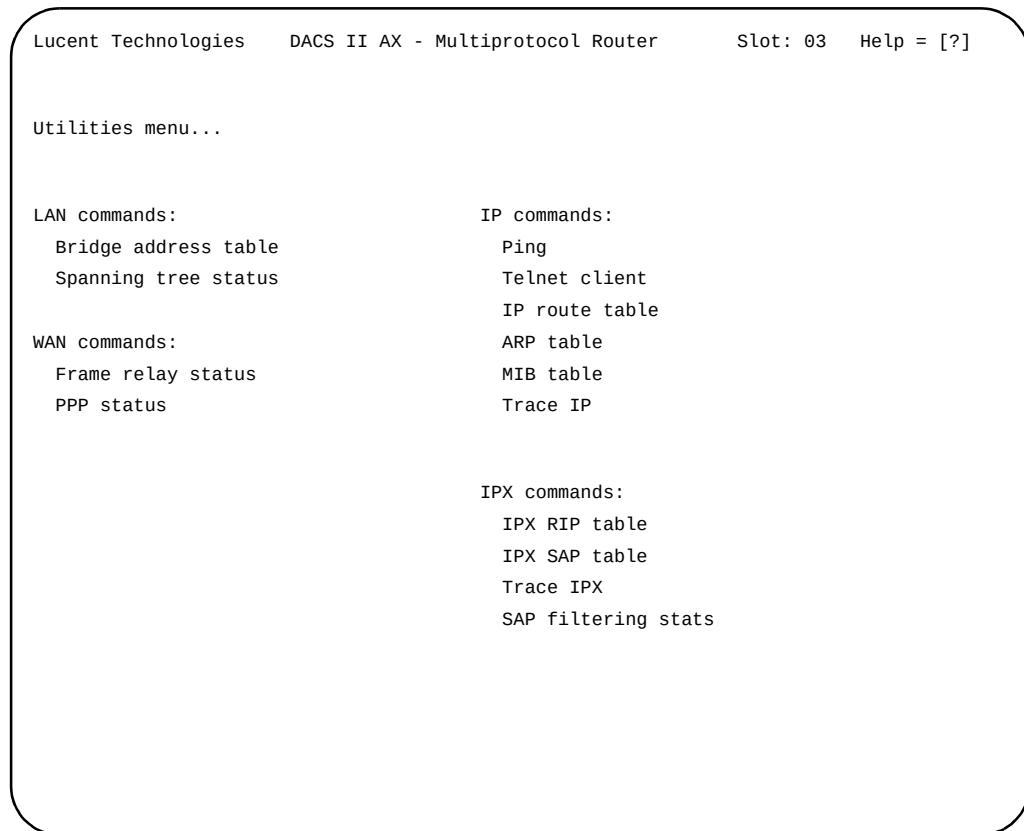


**Figure 20-71. Router Utilities Menu**

The *Router Utilities Menu* is divided into four areas.

- The **LAN commands** allow you to view the Bridge Address Table and Spanning Tree Status displays.
- The **WAN commands** allow you to monitor Frame Relay status and PPP status.
- The **IP commands** include PING, Telnet client, IP route table, ARP table, MIB table, and Trace IP.
- The **IPX commands** include IPX RIP table, IPX SAP table, Trace IPX, and SAP filtering stats.

## LAN Commands - Bridge Address Table

### Procedure

To view the Bridge Address Table:

1. From the *Router Utilities Menu*, place your cursor on the *Bridge Address Table* field and press **<Enter>**. The following display appears:

```
Bridge address table...
index mac-address link time-to-live type

 80 00:20:54:2c:53:05 0 290 seconds dynamic
 144 00:aa:00:74:25:09 0 299 seconds dynamic
 176 00:40:33:91:85:0b 0 161 seconds dynamic
 448 52:54:00:da:2a:1c 0 294 seconds dynamic
 496 00:00:1b:19:e8:1f 0 259 seconds dynamic
 512 00:40:33:91:85:20 0 81 seconds dynamic
 528 00:00:e8:c2:75:21 0 293 seconds dynamic
 640 00:00:1b:27:2b:28 0 291 seconds dynamic
 720 00:60:08:59:26:2d 0 256 seconds dynamic
 752 00:20:54:2e:3d:2f 0 299 seconds dynamic
 864 00:40:05:1b:e6:36 0 274 seconds dynamic
 960 52:54:00:da:29:3c 0 299 seconds dynamic
 1024 00:60:08:bf:10:40 0 234 seconds dynamic
 1040 00:00:f8:05:c6:41 0 293 seconds dynamic
 1216 00:20:54:2d:28:4c 0 159 seconds dynamic
 1392 52:54:00:da:2e:57 0 269 seconds dynamic
 1424 00:20:54:2d:30:59 0 298 seconds dynamic
 1488 00:20:54:22:94:5d 0 159 seconds dynamic
 1616 00:60:08:bf:0f:65 0 284 seconds dynamic
 1712 52:54:00:da:3c:6b 0 270 seconds dynamic
Press any key to continue...
```

**Figure 20-72. Bridge Address Table Display**



**NOTE:**

The Bridge Address Table is enabled from the Logical Port Summary submenu. See the Logical Port Configuration section for this procedure.

**Bridge Address  
Table Field  
Descriptions**

**Index:** Each Router Module saves 4096 addresses. The addresses are saved in a "hash" table format. The index number represents the position in the hash table at which the MAC address is saved.

**MAC Address:** This field identifies the MAC address that corresponds to a specific index in the bridge table.

**Link:** Identifies the logical port on which the MAC address is located.

**Time To Live:** This count represents the amount of time (in seconds) that an automatically learned MAC address can remain inactive before it is deleted. The maximum count is *300* seconds (5 minutes).

**Type:** The address is either *static* or *dynamic*. If it is a *static* address, it will live forever. If it is *dynamic*, it is a "learned" address, and will be removed when the time-to-live value is reached.

---

## LAN Commands - Spanning Tree Status

The Spanning Tree Status Utility is an algorithm that determines which link or bridge data should travel, which is the fastest route for the data to travel, and ensures there is no collision in a network with redundant connections between bridged LANs. Typically in redundant bridged LAN connections, you will find one connection is always in a forward position, while the other connection is in standby mode. Should the first connection go down, the spanning tree algorithm learns of the disruption and ensures the back up connection is ready to take over. Without a spanning tree algorithm, there is a possibility that both connections could result in an endless loop of traffic on the LAN.

 **NOTE:**  
 Spanning Tree Status is enabled from the Logical Port Summary Submenu. See the Logical Port Configuration section for this procedure.

### Procedure

To Access the Spanning Tree Status Utility:

1. From the *Router Utilities Menu*, place your cursor on the *Spanning Tree Status* field and press **<Enter>**. The following display appears:

```
Spanning tree information display...

Bridge id.....: 80000020 54320f75 root: 80000020 54269955
root port.....: 0 cost to root.: 100

spanning tree port parameters for port 0
port state.....: Forwarding path cost....: 100
designated root...: 80000020 54269955 cost to root.: 0
designated bridge.: 80000020 54269955
Press any key to continue...
```

**Figure 20-73. Spanning Tree Information Display**

## Spanning Tree Information Display Field Descriptions

**Bridge ID:** This field specifies the ID used by this bridge. The first four digits represent the bridge priority number that was configured in the *LAN Configuration* submenu. The remaining digits identify the physical (MAC) address of the bridge.

**Root port:** This field identifies the port that will be used to forward packets toward the root. If the value is -1, then this bridge is the root.

**Root:** This field specifies the best information the Router Module has as to who is the root.

**Cost to root:** The best path to the root is the one that causes the least delay. If you have a low cost, your link speed is usually fast and your delay is slight. However, if your link speed is slow, your cost will be high and you will experience more delay.

The range is from 0 to 65535, with a lower number indicating a smaller delay.

**Port State:** If Spanning Tree is enabled, the port state will appear on the screen. The port states are: *Listening*, *Learning*, *Forwarding*, or *Blocking*.

- ***Listening*** means that the Router Module bridge is looking for configuration messages to identify the root.
- ***Learning*** means that the Router Module is creating a bridge table as it learns addresses. However, it is not forwarding the data.
- ***Forwarding*** means the Router Module is forwarding data through the network.
- ***Blocking*** means that no data is being sent. The Router Module has discovered a redundant link that is not included in the Spanning Tree.

**Designated root:** Displays the designated root, in a format that shows the MAC address preceded by the hexadecimal equivalent of the route cost.

**Designated bridge:** Displays the designated bridge, which forwards packets from the LAN towards the root. This is also displayed in a format that shows the MAC address preceded by the hexadecimal equivalent of the route cost.

**Path cost:** Displays the path cost from the port to the root.

**Cost to root:** Displays the path cost from the bridge to the root.

---

## WAN Commands - Frame Relay Status

### Procedure

To Access the Frame Relay Status Utility:

1. From the *Router Utilities Menu*, place your cursor on the *Frame Relay Status* field and press **<Enter>**. The following display appears:

```
Frame relay port status display...
enabled...: 1
instance...: 0 wan port...: 1 poll count: 4 full status.: 1
user SSN...: 10 user RSN...: 1 ntwk SSN...: 0 ntwk RSN....: 0
ntwk mode...: 0 mgmt mode...: 1 errors....: 0 max errors...: 3
win size...: 4 poll cycles: 6 interval...: 10 verification: 15
sent poll.: 1 recv'd poll: 0 out-of-svc: 1 spare.....: 0
window of events...: [1,1,1,1,1,1,1,1,0,0,0,1,1,0,0]
active dlci(s).....: []
reported dlci(s).....: []
last msg size = 0
last management message:
00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,
00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,
00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,

last error code = 0 last error time = 142270
last errored message: ff,03,c0,21,01,b0,00,12,01,04,06,40,05,06,00,00,
Error History: 1100, 0101, 0101, 0101, 0101, 1100, 0101, 0101, 0101, 1100, 0101,
0101, 0101, 1100, 0101, 0101, 0101, 0101, 1100, 0101, 0101, 0101, 1100, 0101, 0
101, 0101, 1100, 0101, 0101, 0101, 0101, 1100,

Press any key to continue...
```

**Figure 20-74. Frame Relay Port Status Display**

**Frame Relay Status  
Utility Field  
Descriptions**

**Enabled:** If this field is set to 1, Frame Relay is enabled on the designated WAN port. If it is set to 0, Frame Relay is not enabled.

**Instance:** This indicates an internal process instance.

**User SSN:** This is the user's Send Sequence Number of the last transmitted message to the network side.

**Network Mode:** If this field is set to 1, the Router Module is configured for the "network" mode. If it is set to 0, the Router Module is configured for the "user" mode.

**Win Size:** This field displays the size of the sliding window used by the network to determine whether the Router Module is active. After a Router Module is declared inactive, the network will wait a specified number of poll cycles before declaring the device active again.

**Sent Poll:** If the user side sent a poll to the network side during the last interval, this parameter is set to 1.

**WAN Port:** This identifies the WAN port that is running frame relay. (currently only WAN Port 1)

**User RSN:** This is the user's Receive Sequence Number of the last received message from the network.

**Management Mode:** This indicates which management mode is active.

0 = None, 1 = ANSI, 2 = CCITT, 3 = LMI

**Poll Cycles:** This indicates the number of poll cycles that will occur before a full status request is issued. (For example, in the submenu shown above, 6 poll cycles will occur before a full status request is issued.)

**Received Poll:** If the network side received a poll from the user side during the last interval, this parameter is set to 1.

**Poll Count:** This represents the number of the current poll cycle. This number will only go as high as the number defined in the poll cycle parameter.

**Network SSN:** This is the network's Send Sequence Number of the last transmitted message to the user's side.

**Errors:** If an error was detected during the last interval on either the network or user side, this is set to 1. If there are no errors, it is set to 0.



**Interval:** This represents the frequency (in seconds) at which the network is polled for status. (In the submenu example shown above, the network will be polled every 10 seconds).

**Out-of-Service:** If the Router Module is out of service, this parameter is set to 0. If it is in service, it is set to 1.

**Full Status:** This field represents the frequency at which the Router Module requests full status information. The full status frequency is relative to the number of requests for regular status. The range is from 1 to 255. A value of 6 would mean that 1 of every 6 status requests will be a request for full status. This parameter is only applicable when the Router Module is configured for "user" mode.

**Network RSN:** This is the network's Receive Sequence Number of the last received message from the user's side.

**Max Errors:** This represents the maximum number of errors that can occur during a sliding window events count before the frame relay device is declared "inactive" or "out-of-service."

**Verification:** This represents the network's verification timer interval setting (in seconds). This value is generally set higher than the polling interval value. In the submenu example given above, the network side interval is set to 10 and the verification interval is set to 15. This allows the Router Module to wait a little longer than the network waits for a poll from the user side. It is considered an error if a poll is not received from the user side within the specified time.

**Spare:** This field is not used.

**Window of Events:** The Router Module looks at the number of elements configured in the *Events* field (WAN Virtual Port Configuration submenu), and if the number configured in the *Threshold* field are in error, the module declares itself out of service.

**Active DLCIs:** The Router Module displays the first 16 active DLCIs (logical ports).

**Reported DLCIs:** The Router Module displays the first 16 DLCIs reported by the network regardless of their state.

**Last Message Size:** This field displays the size (in bytes) of the last message that was seen by the Router Module.

**Last Management Message:** This field displays the last management message that was seen by the Router Module.

**Last Error Code:** This field defines the last error that was seen by the Router Module. An explanation of the codes is given below:

- 1 = Unknown
- 2 = Receipt of Frame Too Short
- 3 = Receipt of Frame Too Long
- 4 = Illegal DLCI
- 5 = Unknown DLCI
- 6 = Data Link Management Protocol Error
- 7 = Data Link Management Unknown Information Element
- 8 = Data Link Management Sequence Error
- 9 = Data Link Management Unknown Report Type
- 10 = No Error Since Reset

**Last Error Time:** This field displays the time the last error was seen.

**Last Errored Message:** This represents the first "n" bytes of the last message received. If no errors occurred, this field is irrelevant.

**Error History:** Provides a history of the last 32 frame relay errors encountered by the Router Module. As errors occur, the latest error code is added to the beginning of this field, and the oldest of the 32 error codes is dropped from the end of the field. The error types are encoded in hexadecimal format, with the **right** two digits being the cause codes set forth in RFC 1315 and 2115, and the **left** two digits representing a manufacturer-unique cause code that further explains the cause of the error. The cause codes are provided in the following tables.

**Table 20-1. RFC 1315/2115 Cause Codes (Last Two Digits)**

| Code | Description                                       |
|------|---------------------------------------------------|
| 00   | No Cause Specified                                |
| 01   | Unknown Error                                     |
| 02   | Receive Short (Frame too short for Frame Relay)   |
| 03   | Receive Long (Frame too long for Frame Relay)     |
| 04   | Illegal Address (Illegal DLCI)                    |
| 05   | Unknown Address (Unknown DLCI)                    |
| 06   | DLCMI Protocol Error (Frame Relay protocol error) |
| 07   | DLCMI Unknown IE (Unknown information element)    |
| 08   | DLCMI Sequence Error (Sequence number error)      |
| 09   | DLCMI Unknown Report (Unknown report type)        |
| 0A   | No Error Since Reset (No errors since last reset) |

**Table 20-2. Manufacturer-Unique Cause Codes (First Two Digits)**

| <b>Code</b> | <b>Description</b>                                    |
|-------------|-------------------------------------------------------|
| 00          | No Cause Specified                                    |
| 01          | Bad Extended Address Bits                             |
| 02          | Bad Control Field                                     |
| 03          | Bad Sub Network Address Protocol                      |
| 04          | Frame Relay Management - Unnumbered Info              |
| 05          | CCITT, ANSI Management - Protocol Discriminator Error |
| 06          | LMI Management - Protocol Discriminator Error         |
| 07          | Invalid Dummy Call Reference                          |
| 08          | Bad Status Message Byte                               |
| 09          | Invalid Locking Shift Byte                            |
| 0A          | Report Type IE - Bad Report Information Element Byte  |
| 0B          | Report Type IE - Bad Information Element Length       |
| 0C          | Report Type IE - Bad Type of Report Byte              |
| 0D          | Bad Link Integrity Verification Byte                  |
| 0E          | Bad Link Integrity Verification Length                |
| 0F          | Report Type IE - Invalid Type of Report Byte          |
| 10          | Bad PVC Status Information Element                    |
| 11          | No Response to Status Enquiry Poll                    |
| 12          | Bad Organizationally Unique Identifier                |

## WAN Commands - PPP Status

### Procedure

To Access the PPP Status Utility:

1. From the *Router Utilities Menu*, place your cursor on the *PPP Status* field and press **<Enter>**. The following display appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

PPP port status...

Virtual Port: WAN 1

Control protocol state...

LCP.....: Req Sent
BNCP.....: Closed
IPCP.....: Closed
IPXCP.....: Closed

Loop Detected.....: No

Negotiated options...

Multilink.....: No
Protocol Compression..: No
Address Compression...: No
Async Map.....: No
Magic Number.....: No
```

**Figure 20-75. PPP Port Status Display**

2. Press **<Enter>** to cycle through the options for the *Virtual Port* field until the status is displayed for the port you want to view.
3. When done viewing, press **X** to return to the *Router Utilities* submenu.

**PPP Port Status  
Display Field  
Descriptions**

**Virtual Port:** (*option field*) Designates the virtual port for which the status is being displayed.

**Control Protocol State:** Designates the type of control protocol that is being used:

**LCP (Link Control Protocol):** The status of this protocol will be:

- **Opened** - Config ACK, both sent and received
- **Request Sent** - Attempt sent to Config connection but Config not received
- **ACK Sent** - a Config Request and Config ACK sent but Config ACK not received
- **ACK Received** - a Config Request and Config ACK received but config ACK not sent
- **Closed** - terminate ACK received

**BNCP (Bridge Network Control Protocol):** The status of the bridging protocol will be shown only if bridging protocol is enabled. The status will be *Opened*, *Request Sent*, *ACK Sent*, *ACK Received*, or *Closed*.

**IPCP (IP Control Protocol):** The status of the IP control protocol will only be shown if IP protocol is enabled. The status will be *Opened*, *Request Sent*, *ACK Sent*, *ACK Received*, or *Closed*.

**IPXCP (IPX Control Protocol):** The status of the IPX control protocol will only be shown if IPX protocol is enabled. The status will be *Opened*, *Request Sent*, *ACK Sent*, *ACK Received*, or *Closed*.

**Negotiated Options:** For every protocol that is enabled, the Router Module will negotiate certain options with the other units to which it is connected.

**Multilink:** If this field reads *Yes*, it indicates that Multilink protocol has been accepted and will be used by the equipment to which the Router Module is connected.

**Protocol Compression:** If this field reads *Yes*, it indicates that Protocol Field Compression has been accepted and will be used by the equipment to which the Router Module is connected.

**Address Compression:** If this field reads *Yes*, it indicates that Address Field Compression has been accepted and will be used by the equipment to which the Router Module is connected.

**Async Map:** In synchronous applications, this field will read *No*. In asynchronous applications, this field will read *Yes* and the module will negotiate the use of control and escape characters, resulting in the use of less bandwidth.

**Magic Number:** A random number is assigned to each end of a PPP connection. A message containing this random number is periodically transmitted. Receipt of a message with the same random number indicates that the link is in loop. If this field reads *Yes*, it indicates that each end has successfully negotiated a unique random number.

**Loop Detected:** If this field reads *Yes*, the Router Module is in loopback state.

---

## IP Commands - Ping

**PING** stands for *Packet Internet Groper* as defined in RFC792. This utility is used to ensure that the IP host is reachable. PING allows you to verify that a path exists to each IP address by sending ICMP echo request and replay messages.

### Procedure

To Access the PING Utility:

1. From the *Router Utilities Menu*, place your cursor on the *Ping* field and press **<Enter>**. The following submenu appears:

```
Enter destination IP address and (optional) count and length
: 207.124.164.88 10 64
.....
%PING - response #1 timeout.
.....
%PING - response #2 timeout.
.....
%PING - response #3 timeout.
.....
%PING - response #4 timeout.
.....
%PING - response #5 timeout.
```

**Figure 20-76. Ping Utility Submenu**

2. Next, enter a destination IP address and optional ping count and length. The destination IP address is the IP address you want to PING. The address is entered in "dotted decimal notation."
3. Then, enter a count. The optional count is the number of times you want to ping the defined address. If you enter a count, it must follow the destination IP address, preceded by a space.
4. Enter a length. The optional length is the size (in bytes) of the ping message you plan to send. This is used to verify that the receiving end can receive a packet of the defined size. If you enter a ping length, it must follow the optional ping count, preceded by a space.
5. After you enter the destination address, count and length, press **<Enter>**.

The module responds with ping statistics. The screen will show the number of pings sent, the number of bytes received (echoed back) from the IP address, and the length of time (in milliseconds) that it took for the echo request message to be sent to the IP address and the echo reply message to be returned to the Router Module. If the count is 0, the trip was accomplished in less than 10 ms.

If an invalid address is entered, this message will appear on the screen:

```
% PING -response #1; timeout
```

```
Press any key to continue . . .
```

Pings are sent and received every second. If no reply is received, the packet is lost. When you exit this screen, all pinging stops.



**NOTE:**

If you plan to stay on this screen for more than 10 minutes, periodically press the **<Space Bar>** or any other key on the keyboard. Otherwise, the module automatically terminates your session (performs a log off).

---



## IP Commands - Telnet Client

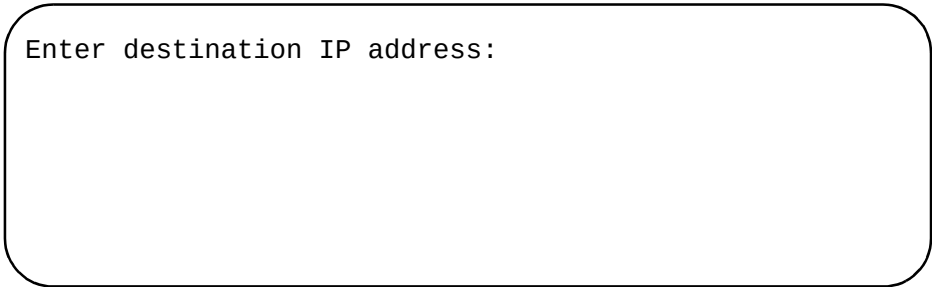
---

Based on the client-server model, Telnet provides a local client that contacts a remote server. The Telnet protocol creates a simple Network Virtual Terminal (NVT) which makes all hosts appear as if they employ exactly the same techniques for presenting information to the screen and exactly the same commands for performing operations. The terminal displays one line at a time.

### Procedure

To access the Telnet Client Utility:

1. From the *Router Utilities Menu*, place your cursor on the *Telnet Client* field and press **<Enter>**. The following prompt appears:



Enter destination IP address:

---

**Figure 20-77. Telnet Client Prompt**

2. Enter a destination IP address. For example, enter 26.3.0.1.  
Enter destination IP address: 26.3.0.1
  3. After you press **<Enter>**, the Telnet Client sends you a message to tell you what it is doing:  
Attempting connection to host 26.3.0.1  
Connected to host 26.3.0.1.  
Press **<Ctrl> C** to terminate connection to remote host.  
login:
  4. If Telnet successfully connects to the host you specified, you are asked to login.
-

## IP Commands - IP Route Table

This table is used to send a datagram to the Router Module that will, in turn, send it to its next hop.

### Procedure

To Access the IP Route Table Utility:

1. From the *Router Utilities Menu*, place your cursor on the *IP Route Table* field and press **<Enter>**. The following submenu appears:



**Figure 20-78. IP Route Table Submenu**

2. Select *Show IP Route* or *Dump IP Route Table* (place your cursor on either field and press **<Enter>**). *Show IP Route* displays a specific route for an individual destination. *Dump IP Route Table* displays a listing of every destination address and the route each takes.

## Procedure

To show the IP Route:

1. From the *IP Route Table* submenu, place your cursor on the *Show IP Route* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]
Show IP route menu

Requested route.: 192.168.200.67

Route.....: 192.168.200.67 Port.....: Internal
Mask.....: 255.255.255.255 Hops.....: 0
Next Hop.....: Direct TimeToLive.....: Forever
```

**Figure 20-79. Show IP Route Submenu**

2. With your cursor on the *Requested Route* field, press **<Enter>**, then type in the specific destination network address or a specific host address for which you wish to see the IP route displayed. Press **<Enter>** again, and the IP Route will be displayed. If a route to the specified address cannot be determined, "No route found" will be displayed on the lower left side of the screen.
3. The information for each field on the screen is detailed on the following page.

**Show IP Route**  
**Field Descriptions**

**Requested route:** (*text field*) This field allows you to request routing information for a specific destination network address or a specific host address. Enter the requested route address in "dotted decimal notation."

**Route:** This address is the destination network address or a specific host address. It is represented in "dotted decimal notation." Each field represents 8 bits of the address. The range of each field is from 0-255.

**Mask:** This address is generated automatically and is represented in "dotted decimal notation."

**Port:** Identifies the port from which the datagram is sent. If it is set to 0, the port is a logical port. If it is set to *Internal*, it represents the router address.

**Hops:** Indicates the number of hops required to reach the remote IP network. The range is from 0-15.

**Time To Live:** This count represents the amount of time (in seconds) that an address can remain inactive before it is deleted. If the field is set to *Forever*, the address will not be deleted; it has been entered manually and will not age.

---

## Procedure

To Dump the IP Route Table:

1. From the *IP Route Table* submenu, place your cursor on the Dump *IP Route Table* field and press **<Enter>**. The following display appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

IP route table display menu Page 1 of 68

Address/Mask Bits NextHop Port Metric TTL Type RIP OSPF UseCt
12.0.0.1/32 direct int 0 4evr stat Yes No 0
192.168.200.67/32 direct int 0 4evr stat Yes No 0
192.168.200.0/24 direct 0 0 180 dyn Yes No 0

Page next/prev = ['+'/'-']
```

**Figure 20-80. IP Route Table Display**

2. The *IP Route Table* display is a read-only screen. Press any key to cycle through all of the addresses. The information for each field on the screen is detailed on the following page.

**IP Route Table  
Display Field  
Descriptions**

**Address/Mask Bits:** Displays the address and the mask bits for which the routing information is being shown.

**Next Hop:** This field indicates the IP address to which an IP frame is to be forwarded, or *Direct* if it is a direct route. The network portion matches the network portion of the router port. The next hop is represented in "dotted decimal notation."

**Port:** Identifies the port from which the datagram is sent. If it is set to 0, the port is a logical port. If it is set to "internal," it represents the router address.

**Metric:** Indicates the number of hops required to reach the remote IP network. The range is from 0-15.

**TTL (Time To Live):** This count represents the amount of time (in seconds) that an address can remain inactive before it is deleted. If the field is set to *4evr* (Forever), the address will not be deleted; it has been entered manually and will not age.

**Type:** Indicates the type of route - *stat* (static) or *dyn* (dynamic).

**RIP:** Displays *Yes* if this is a RIP Route.

**OSPF:** Displays *Yes* if this is an OSPF Route.

**UseCt:** Displays the number of times that the route has been used since the last update.

---

## IP Commands - ARP Table

**ARP** stands for *Address Resolution Protocol* as defined by RFC826. ARP is used to obtain the physical layer address associated with the IP address. Mapping is created between the physical and IP addresses. The physical addresses are dynamically discovered.

### Procedure

To Access the ARP Table Utility:

1. From the *Router Utilities Menu*, place your cursor on the *ARP Table* field and press **<Enter>**. The following display appears:

ARP table display...

| Protocol Address | Hardware Address  | State    | TimeToLive |
|------------------|-------------------|----------|------------|
| -----            | -----             | -----    | -----      |
| 192.168.200.78   | 00:00:1b:27:3d:e7 | Resolved | 152        |
| 192.168.200.75   | 52:54:00:da:28:07 | Resolved | 192        |
| 192.168.200.10   | 00:00:1b:27:41:d1 | Resolved | 590        |
| 192.168.200.69   | 00:80:c8:2f:80:c1 | Resolved | 473        |
| 207.124.164.80   | 00:00:01:03:60:94 | Resolved | 441        |
| 192.168.200.105  | 00:a0:76:c0:0d:d6 | Resolved | 494        |
| 192.168.200.72   | 00:60:08:9a:7f:7a | Resolved | 559        |
| 192.168.200.83   | 00:60:08:bf:10:40 | Resolved | 283        |
| 192.168.200.74   | 00:00:1b:27:2b:28 | Resolved | 498        |
| 192.168.200.91   | 52:54:00:d9:c4:b2 | Resolved | 512        |
| 207.124.164.4    | 00:20:54:30:00:92 | Resolved | 588        |
| 192.168.200.109  | 00:40:33:91:85:20 | Resolved | 495        |
| 207.124.164.37   | 00:20:54:2d:28:4c | Resolved | 588        |
| 207.124.164.7    | 00:20:54:2d:37:ca | Resolved | 588        |
| 192.168.200.87   | 52:54:00:da:2a:8d | Resolved | 371        |
| 207.124.164.13   | 00:20:54:2d:30:59 | Resolved | 588        |
| 192.168.200.97   | 00:40:95:05:9a:a6 | Resolved | 569        |
| 192.168.200.98   | 52:54:00:da:2c:b7 | Resolved | 305        |
| 192.168.200.106  | 00:40:95:15:d8:ec | Resolved | 570        |
| 192.168.200.7    | 00:00:f8:05:c6:41 | Resolved | 491        |
| 207.124.164.71   | 00:60:08:9a:86:e9 | Resolved | 307        |
| 207.124.164.9    | 00:20:54:21:58:7c | Resolved | 588        |

Press any key to continue

**Figure 20-81. ARP Table Display**

2. The *ARP Table* display is a read-only screen. The information for each field on the screen is detailed on the following page.

**ARP Table Display  
Field Descriptions**

**Protocol Address:** This is the IP address that has been mapped to a hardware (physical) address.

**Hardware Address:** This is the physical address that is associated with the IP address.

**State:** The state is either *Pending* or *Resolved*. If the router is in a *Pending* state, the address has not been resolved and the router is waiting for an ARP reply message.

**Time To Live:** This count represents the amount of time (in seconds) that the address can remain inactive before it will be deleted. The maximum count is *600* seconds (10 minutes).

---



## IP Commands - MIB Table

The MIB display is significant for those running IP traffic. The table displays some of the MIB-II parameters as defined in RFC1213.

### Procedure

To Access the MIB Table Utility:

1. From the *Router Utilities Menu*, place your cursor on the *MIB Table* field and press **<Enter>**. The following display appears:

```
MIB II display...
**** IP variables ****
ipInReceives...: 27313 ipInHdrError: 0 ipInAddrErrors: 0
ipForwDatagrams: 1035 ipInDiscards: 0 ipInDelivers: 26276
ipUnknownProtos: 0 ipOutRequest: 16708 ipOutDiscard: 0
ipOutNoRoutes...: 6 ipReasmOKs : 0 ipReasmFails: 0
**** ICMP variables ****
icmpInMsgs.....: 105 icmpInErrors: 0 icmpInDestUnreac: 0
icmpInTimeExcds: 1 icmpInParmPr: 0 icmpInSrcQuenchs: 0
icmpInEchos.....: 2 icmpInEchoRp: 102 icmpInTimestamps: 0
icmpInTstampRep: 0 icmpInAddrMa: 0 icmpInAddrMaskRe: 0
icmpOutMsgs.....: 110 icmpOutError: 0 icmpOutDestUnrea: 3
icmpOutTimeExcd: 1 icmpOutParmP: 0 icmpOutSrcQuench: 0
icmpOutRedirect: 0 icmpOutEchos: 0 icmpOutEchoReps : 106
icmpOutTimestam: 0 icmpTimesRep: 0 icmpOutAddrMasks: 0
icmpOutAddrMaRe: 0
**** UDP variables ****
udpInDatagrams.: 25485 udpNoPorts : 0 udpInErrors : 0
udpOutDatagrams: 23124
Press any key to continue...
```

**Figure 20-82. MIB Table Display**

## IP Commands - Trace IP

Trace IP tracks IP traffic (packets) to or from the Router Module. It displays the source and destination of each packet, as well as the port on which the traffic is sent or received. It also lists the protocol being used (Transmission Control Protocol or User Datagram Protocol).

**⇒ NOTE:**  
Trace IP only traces packets destined for or generated by the Router Module. Traffic passing through the Router Module is not traced.

### Procedure

To access the Trace IP Utility:

1. From the *Router Utilities Menu*, place your cursor on the *Trace IP* field and press **<Enter>**. The following display appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

-----Trace log-----
IP.: in port 0 - UDP frame: scr = 192.168.230.202; dest = 255.255.255.255
IP.: in port 30 - UDP frame: scr = 12.0.30.2; dest = 255.255.255.255
IP.: in port 25 - UDP frame: scr = 12.0.25.2; dest = 255.255.255.255
IP.: in port 0 - UDP frame: scr = 192.168.230.120; dest = 255.255.255.255
IP.: in port 0 - UDP frame: scr = 192.168.230.202; dest = 255.255.255.255
IP.: in port 27 - UDP frame: scr = 12.0.27.2; dest = 255.255.255.255
IP.: in port 31 - UDP frame: scr = 12.0.31.2; dest = 255.255.255.255
IP.: in port 27 - UDP frame: scr = 12.0.27.2; dest = 255.255.255.255
IP.: in port 31 - UDP frame: scr = 12.0.31.2; dest = 255.255.255.255
IP.: in port 0 - UDP frame: scr = 192.168.230.156; dest = 255.255.255.255
IP.: in port 0 - UDP frame: scr = 192.168.230.202; dest = 255.255.255.255
IP.: in port 0 - UDP frame: scr = 192.168.230.202; dest = 255.255.255.255
IP.: in port 24 - UDP frame: scr = 12.0.24.2; dest = 255.255.255.255
IP.: in port 22 - UDP frame: scr = 12.0.22.2; dest = 255.255.255.255
IP.: in port 20 - UDP frame: scr = 12.0.20.2; dest = 255.255.255.255
IP.: in port 23 - UDP frame: scr = 12.0.23.2; dest = 255.255.255.255
IP.: in port 21 - UDP frame: scr = 12.0.21.2; dest = 255.255.255.255
IP.: in port 19 - UDP frame: scr = 12.0.19.2; dest = 255.255.255.255
 Clear trace log = ['C']
```

**Figure 20-83. Trace IP Utility Display (Trace Log)**

## IPX Commands - IPX RIP Table

### Procedure

To Access the IPX RIP Table Utility:

1. From the Router Utilities Menu, place your cursor on the *IPX RIP Table* field and press **<Enter>**. The following display appears:

```
IPX router RIP information table display...

network hops ticks link router address time to live
----- -
01100001 0 1 0 002054300007 forever
00000001 1 2 0 00e029248a04 148 secs
Press any key to continue...
```

**Figure 20-84. IPX Router RIP Information Table Display**

The information displayed in this table is detailed on the following page.

## IPX Router RIP Information Table Display Field Descriptions

**Network:** The identification of the network that the Router Module has learned is shown in this field.

**Hops:** This field tells you how many hops away the network is from the router.

**Ticks:** A tick is a NetWare delay estimate used to locate the fastest route to a destination device and to calculate the time-out to re-transmit an IPX frame. One second is equivalent to 18 ticks; therefore, 1 tick is approximately 55 milliseconds. Default tick values are based upon the line speed being used.

 **NOTE:**  
One tick is used for an Ethernet LAN running at 10 Mbps.

| Line Speed | Approx. # of Ticks |
|------------|--------------------|
| 2.048 Mbps | 5                  |
| 1.544 Mbps | 7                  |
| 1.024 Mbps | 10                 |
| 512 Kbps   | 20                 |
| 256 Kbps   | 29                 |
| 128 Kbps   | 78                 |
| 64 Kbps    | 156                |
| 56 Kbps    | 178                |
| 38.4 Kbps  | 260                |
| 19.2 Kbps  | 520                |
| 9.6 Kbps   | 1041               |

**Link:** This field identifies the link used to get to the identified network.

**Router Address:** This field identifies the next router in the path to the identified network.

**Time To Live:** This count represents the amount of time (in seconds) that the address can remain inactive before it is deleted from the table. If the field is set to *Forever*, the address will not be deleted; it has been entered manually and will not age.



## IPX Commands - IPX SAP Table

### Procedure

To Access the IPX SAP Table Utility:

1. From the *Router Utilities Menu*, place your cursor on the *IPX SAP Table* field and press **<Enter>**. The following display appears:

```
SAP server information table display...

server network node skt hops port time to live

0640 00000001 00a0c9824c9e e885 1 0 139 secs
 server name: NETFRAME
0640 01100001 0080ad008357 e885 1 0 143 secs
 server name: ENGINEERING
064e 01100001 0080ad414e0e 4018 1 0 160 secs
 server name: MARKETING
0640 01100001 0080ad414e0e e885 1 0 168 secs
 server name: MAIL
0640 00000001 009027b70f70 e885 1 0 171 secs
 server name: ARTHUR
030c 01100001 001083588417 400c 1 0 128 secs
 server name: ENCHANTER
030c 01100001 001083588417 400c 1 0 128 secs
 server name: WINSTON
0640 01100001 0080ad423ff6 e885 1 0 128 secs
 server name: PIGLET
0640 01100001 0080ad425110 e885 1 0 132 secs
 server name: ZOOT
0640 01100001 000000000001 e885 1 0 128 secs
 server name: SIR_ROBIN
Press any key to continue...
```

**Figure 20-85. IPX SAP Server Information Table Display**

## **IPX SAP Server Information Table**

### **Display Field Descriptions**

---

**Server:** This number identifies the server type. The network administrator can use this field to identify server types, e.g., File Server, Print Server, Backup Server, or a specific job server. The numbers are defined by Novell. This field is read-only.

**Network:** This is the network segment on which the service is located.

**Node:** This is the specific node address; i.e, where the service resides.

**Skt (Socket):** The socket is an extension to the source and destination in an IPX address. The socket numbers are defined by Novell.

**Hops:** This field represents the number of hops required to reach the remote IPX network.

**Port:** The range is 0 to n, where 0= the logical port and any other number is the physical port.

**Time To Live:** This count represents the amount of time (in seconds) that an address can remain inactive before it is aged from the table.

**Server Name:** This field displays the name that has been assigned to each server.

---

## IPX Commands - Trace IPX

### Procedure

To Access the Trace IPX Utility:

1. From the *Router Utilities Menu*, place your cursor on the *Trace IPX* field and press **<Enter>**. The following display appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

-----Trace log-----
IPX: in port 0 - SAP frame: operation = get nearest server request
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - RIP frame: operation = RIP response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - SAP frame: operation = server response
IPX: in port 0 - RIP frame: operation = RIP response
IPX: in port 0 - SAP frame: operation = server response

Clear trace log = ['C']
```

**Figure 20-86. Trace IPX Utility Display (Trace Log)**



---

## IPX Commands - SAP Filtering Stats

---

### Procedure

To Access the SAP Filtering Stats Utility:

1. From the *Router Utilities Menu*, place your cursor on the *SAP Filtering Stats* field and press **<Enter>**. The following display appears:

```
Logical link SAP messages filtered
0 0
1 0
2 0
3 0
4 0
5 0
6 0
7 0
8 0
9 0
10 0
11 0
12 0
13 0
14 0
15 0
16 0
17 0

Press any key to continue...
```

---

**Figure 20-87. SAP Filtering Stats Display**

2. The *SAP Filtering Stats* display is a read-only screen. Press any key to cycle through all of the logical links. The display does not refresh automatically; you must exit the screen to update the information.

---

### SAP Filtering Stats Utility Field Descriptions

**Logical Link:** This field identifies the logical port on which IPX SAP messages are being filtered.

**SAP Messages Filtered:** This field indicates the number of IPX SAP messages that were filtered on a particular logical port.

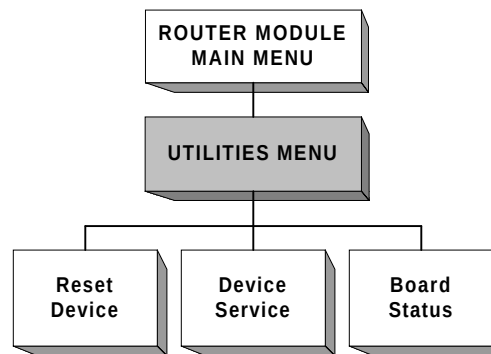
---

## Utilities Menu

---

From the Utilities Menu, you can reset the Channelized Router Hub or set the device status to In Service or Out of Service.

The Utilities Menu structure is illustrated below.



---

**Figure 20-88. Utilities Menu Structure**

## Procedure

To Access the Utilities Menu:

1. From the *Main Menu*, place your cursor on the *Utilities* field and press **<Enter>**. The following menu appears:

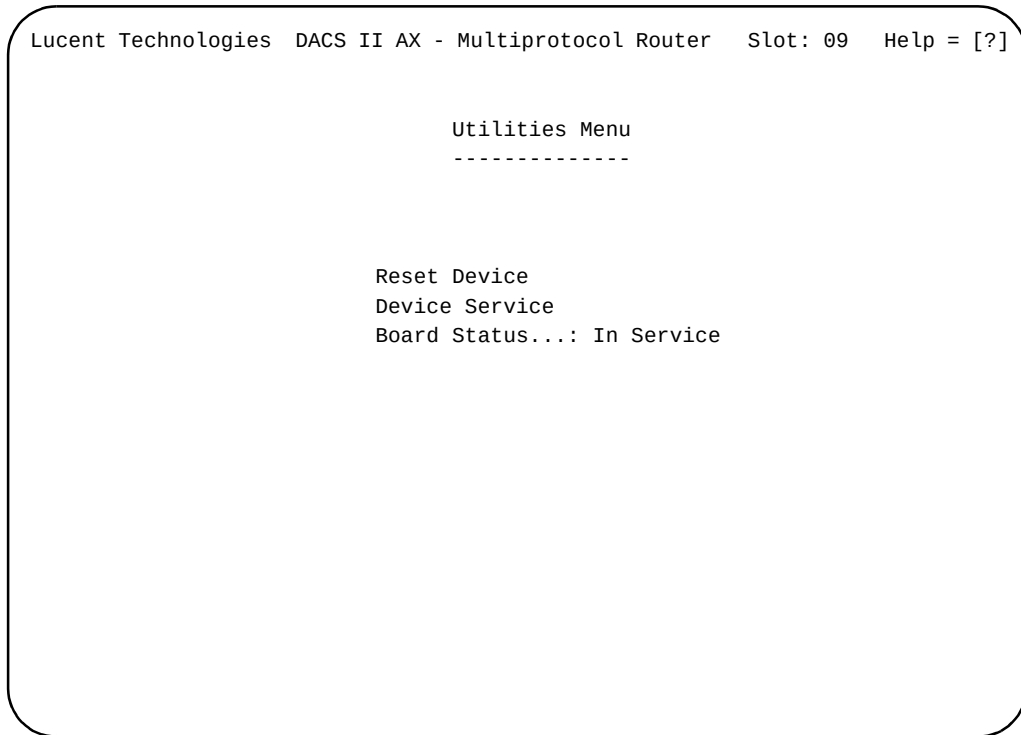


**Figure 20-89. Utilities Menu**

## Procedure - Reset Router Module

To Reset the Router Module:

The Reset utility causes the Router Module to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the System Manager Controller, connections will be restored.



### CAUTION:

*Resetting the module will cause data to be momentarily corrupted.*

1. From the *Utilities Menu*, place your cursor on the *Reset Device* field and press **<Enter>**.
2. A screen will appear that says: Reset Device? Are you sure (Y/N)?"

3. Press **Y** to reset the board. A screen will appear that says: "Alert! Please wait while we establish communications with the system manager! Press any key to continue." Wait a few seconds, and you are returned to the *Node Summary Menu*.



**NOTE:**

Once you have been returned to the Node Summary Menu, note that the Router Module's state will cycle through a combination of "On-line," "Standby," "Out of Service," and finally "On-line." This is a normal occurrence when the device resets.

**Procedure - Put  
Port In Service/  
Out-of-Service**

To Set the Board Status:

The Board Status field allows the administrator to put a port in service or out of service.

1. From the Utilities Menu, place your cursor on the *Device Service* field and press **<Enter>**.
2. If the board status was *In Service*, the following message appears: "Set device to Out Of Service? Are you sure (Y/N)?" Press **Y**, and the board is set to *Out of Service*, and you are returned to the *Utilities Menu*. Press **N**, and you are returned to the *Utilities Menu*.
3. If the board status was *Out of Service*, the following message appears: "Set device to In Service? \*\*Device Will Reset\*\* Are you sure (Y/N)?" Press **Y**, and the module will be reset, the board will be set to *In Service*, and you are returned to the *Node Summary Menu*. Press **N**, and you are returned to the *Utilities Menu*.

***Once you have been returned to the Node Summary Menu, note that the Router Module's state will cycle through a combination of "On-line", "Standby", "Out of Service" and finally "On-line". This is a normal occurrence when the device resets.***

## About Menu

The About Menu displays version, release date, and checksum information for the Channelized Router Hub software, and version information for the Channelized Router Hub hardware.

### Procedure

To Display Module Identification Information:

1. From the *Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following display appears:

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]

About

Software Version.....: Router 1.00C
Software Release Date...: March 6, 2000
Software Checksum.....: 5600
Xilinx Version.....: rtr_rev8
Front Card Type.....: Router
Front Card Revision.....: 0
Rear Card Type.....: Router
Rear Card Revision.....: 0
```

**Figure 20-90. About Display**

2. The *About* display is a read-only screen. Descriptions for each field on this screen are supplied on the following page.

**About Display  
Field Descriptions**

**Version:** Displays the software version currently residing in the Router Module's flash memory.

**Release Date:** Displays the date of module software release.

**Checksum:** Displays the sum of all bytes in the Router Module's flash memory at power up. Also used to identify software version.

**XILINX Version:** Displays the hardware version of downloadable, programmable devices.

**Front Card Type:** Displays the type of Application Module in the system.

**Front Card Rev:** Displays the Application Module's hardware revision level.

**Rear Card Type:** Displays the type of Interface Module in the system.

**Rear Card Rev:** Displays the Interface Module's hardware revision level.

---

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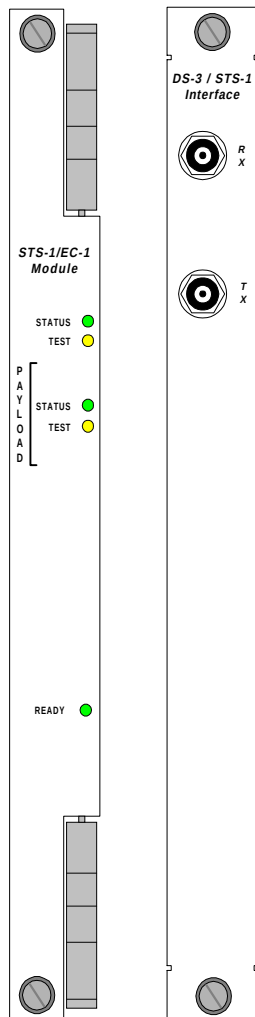
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## Physical Description



The STS-1 Module is used to provide SONET (Synchronous Optical Network) Path Terminating Equipment (PTE) functionality for the DACS II AX. The STS-1 Module assembly occupies a single backplane slot in the DACS II AX chassis, and N+1 Redundancy for this module is available when it is utilized in a DACS II AX-11 nest configured with the N+1 Protection Switch.

The 52 Mbps STS-1 SONET signal is made up of 7 Virtual Tributary (VT) groups. Each VT group is made up of either 4 T1 or 3 E1 virtual tributaries. Since there may be as many as 7 VT groups configured, each STS-1 payload is capable of carrying up to 28 T1 or 21 E1 links. An individual VT Group must be configured with similar signals (all T1 or all E1), however, you may combine groups on the same STS-1 payload.

**NOTE:**  
E1 is not supported for this release.

The module set includes an Application Module that contains backplane, switching, and framing logic, and an Interface Module which provides electrical interface via two BNC connectors.

There are five LEDs on the Application Module - two for the mapper and two for the payload, along with a READY LED. These LEDs are discussed on the following page.

Thumb screws are provided at the top and bottom of the bezels to secure the modules in the chassis and to make an electrical connection to frame ground for regulatory emission compliance. The electrical connection to frame ground also protects the modules from static discharge.

**Figure 21-1. STS-1 Application/Interface Module Set**

---

## LED Descriptions

---

**STATUS - Mapper/  
LIU**

**STATUS** (Mapper/LIU) - if this LED is solid green, the mapper/LIU port is operational and functioning properly. If the LED is solid red, the mapper/LIU port was in error during the last second. This may be due to one of the following:

- Invalid configuration.
  - Framer is bad.
  - Cable is bad or missing.
  - Rear interface card is bad.
- 

**TEST - Mapper/  
LIU**

**TEST** (Mapper) - if this LED is solid yellow, it indicates that the mapper port/LIU is in loop or LIU BERT is enabled. If the LED is flashing yellow, it indicates an error in LIU BERT.

---

**STATUS - Payload**

**STATUS** (Payload) - if this LED is solid green, all in-service T1/E1 links are operational and functioning properly. If the LED is solid red, the T1/E1 link(s) was/were in error during the last second. This may be due to one of the following:

- Invalid configuration.
  - Framer is bad.
  - Cable is bad or missing.
  - Rear interface card is bad.
- 

**TEST - Payload**

**TEST** (Payload) - if this LED is solid yellow, it indicates that T1/E1 link(s) is/are in loop or the link is in Link BERT. If the LED is flashing yellow, it indicates an error in Link BERT.

---

---

## LED Descriptions (Continued)

---

**READY**

**READY** - if this LED is solid green, it indicates that the device is in an online state or defective state. If it is flashing green, it indicates that the device is in standby state. If this LED is solid red, it indicates that the device is in bus error state. If it is flashing red, it indicates that the device is in offline state.

If all LEDs are cascading from top to bottom, the unit is downloading software to its memory chip.

If all LEDs are off except the "Ready" LED, it indicates that all links are Out of Service.

If all LEDs are flashing, it indicates that the rear interface module is missing or the device is being forced Out of Service.

---

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## Regulatory Information

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### North America

The STS-1 Module is designed to comply with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the rear card must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus is designed to meet all requirements of the Canadian Interference Causing Equipment Regulations.

---

### Product Safety

This equipment is designed to meet the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

---

### Europe

This equipment is designed to be in conformity with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

following the provisions of the EMC directive 89/336/EEC, the Low voltage directive 73/23/EEC, and the TTE directive 91/263/EEC.

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## Before You Begin

---

- This chapter is written for ADMINISTRATOR-level users.
  - In order to view the menus associated with the STS-1 Module, a slot must be configured for the module type and the STS-1 Module must be resident in a slot in the equipment chassis. An STS-1 Interface Module must also be resident in the same numbered slot as the STS-1 Application Module. If the slot does not show a "Configured Type," refer to "Configuring a Slot" in Chapter 4 of this manual.
  - Screens are shown for a DACS II AX with the SMC II module. Although the STS-1 Module is also supported by SMC I, there will be some screen differences, mainly involving the Slot Configuration Menu, Slot Configuration Submenu, and Node Summary Menu, as well as anything to do with N+1 Redundancy.
  - For cabling and interface requirements, refer to Appendix B.
-

## Slot Configuration

### Procedure - Configure Slot

To configure a slot or change a slot configuration for the STS-1 module:

1. From the DACS II AX *Main Menu*, scroll down to the *System Configuration* field and press **<Enter>**. The following menu appears:

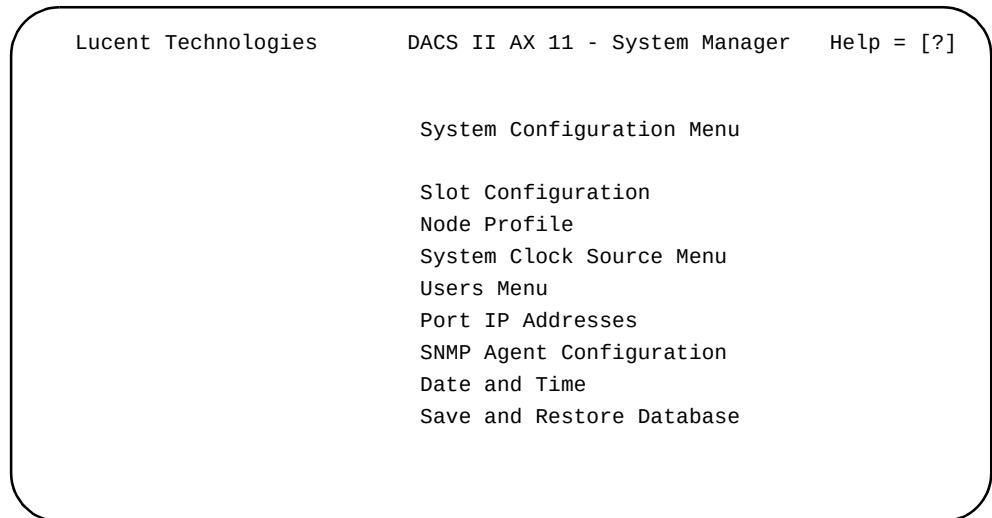


**Figure 21-2. System Configuration Menu**



Place your cursor on the *Slot Configuration* field and press **<Enter>**. The following menu appears, displaying slots numbered from 1 to 4 (DACS II AX-4) or from 1 to 11 (DACS II AX-11).

```

Lucent Technologies DACS II AX-11 - System Manager Help = [?]

 Slot Configuration Menu

 Slot# Device Type Name Redundancy
 ---- -
 1 Octal T1/E1 New York Enable
 2 Octal Voice New York Disable
 3 Octal Voice New York Disable
 4 Octal Voice New York Disable
 5 Octal Voice New York Disable
 6 Octal Voice New York Disable
 7 Octal T1/E1 New York Enable
 8 Octal T1/E1 New York Disable
 9 STS1 New York Enable
 10 STS1 New York Enable
 11 STS1 New York Enable

 N+1 Redundancy: Enable
 N+1 Redundancy Switchover: Automatic
 N+1 Redundancy Restore: Manual

 Change Card = [Enter key] [D]elete Card

```

**Figure 21-3. Slot Configuration Menu**



**NOTE:**

The N+1 Redundancy fields in the Slot Configuration Menu are not displayed if you are using a DACS II AX-4.

2. Move your cursor to the slot number where the STS-1 Module will reside, and press **<Enter>**. The following submenu appears:

Lucent Technologies      DACS II AX-11 - System Manager      Help = [?]

Slot Configuration

Slot name:  
Card type:  
Redundancy: Disable

---

**Figure 21-4. Slot Configuration Submenu**

3. Place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number of up to 11 alphanumeric characters and press **<Enter>** again.
4. Move your cursor to the *Card Type* field and press the **<Enter>** key until "STS1" is displayed.
5. For DACS II AX-11 units with the N+1 Protection Switch, move your cursor to the *Redundancy* field to *Enable* or *Disable* redundancy (not configurable for DACS II AX-4).
6. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**. You are returned to the *Slot Configuration* submenu.

---

### Deleting a Slot Configuration

To delete a card, first remove the card from the equipment chassis. On the Slot Configuration menu (Figure 21-3), move the cursor to the slot configuration to be deleted and press **D**. A message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel. If you do not remove the card prior to pressing **D**, the following message appears: "-ALERT!- Can not delete a device that is present."

---

## Main Menu

The STS-1 Main Menu is accessed via the Node Summary Menu. From the Main Menu you can configure the module, run diagnostic tests, access utilities, view N+1 Redundancy status (DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware revision levels). Menu structure is shown in Figure 21-5.

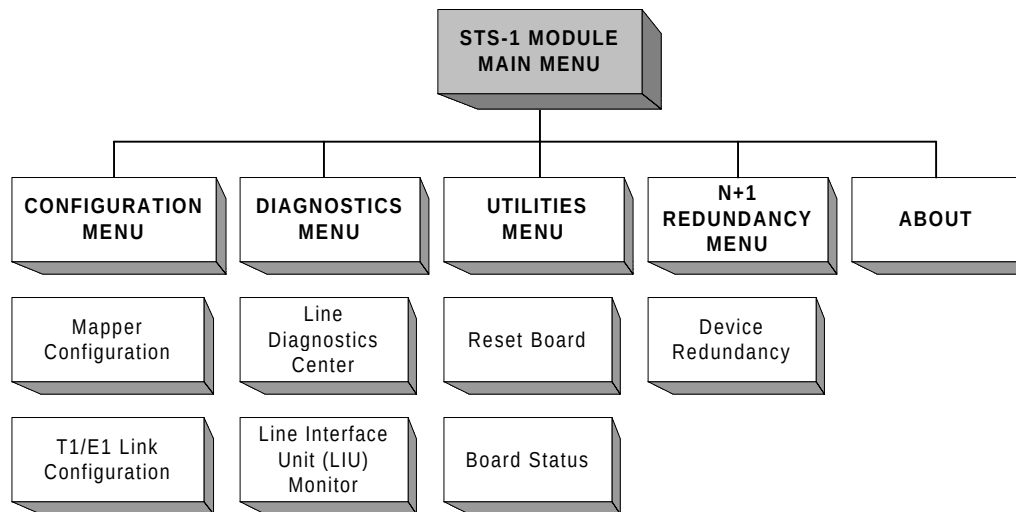


**Figure 21-5. Menu Structure**

**Access STS-1 Main Menu**

To access the STS-1 Main Menu:

1. From the DACS II AX *Main Menu*, move your cursor to the *Node Summary* field and press **<Enter>**. The following menu appears:

```

Lucent Technologies DACS II AX 11 - System Manager Help = [?]
Standby SMC not present N+1 Redundancy State: Enabled
Audio Alarm.....: Enabled

 Node Summary Menu

Slot# Configured Type Device State Alarm

01 + Octal T1/E1 Standby None
02 + Octal T1/E1 Online *None Clock Src
03 + Octal T1/E1 Online *None
04 Quad High Speed Online None
05 Octal Voice Online None
06 Octal Voice Online None
07 Quad T1 Online None
08 + STS1 Online None
09 + STS1 Online None
10 + STS1 Online None
11 + STS1 Standby None
SMCA System Manager A Online None
SMCB System Manager B Not Present None
PSX ProtectionSwitch Online None

[C]lear error counts [S]lot Cfg [E]xpose [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver [R]estore

```

**Figure 21-6. Node Summary Menu**

2. Then place your cursor on the slot number where the STS-1 Module is located and press **<Enter>**. The STS-1 *Main Menu* appears.

**NOTE:**

On the Node Summary Menu, the Configured Type must display "STS-1" and the Device State must display "Online" or "Standby" in order to access the STS-1 Module Main Menu. If the Device State is "Off-line", an alert message is generated.

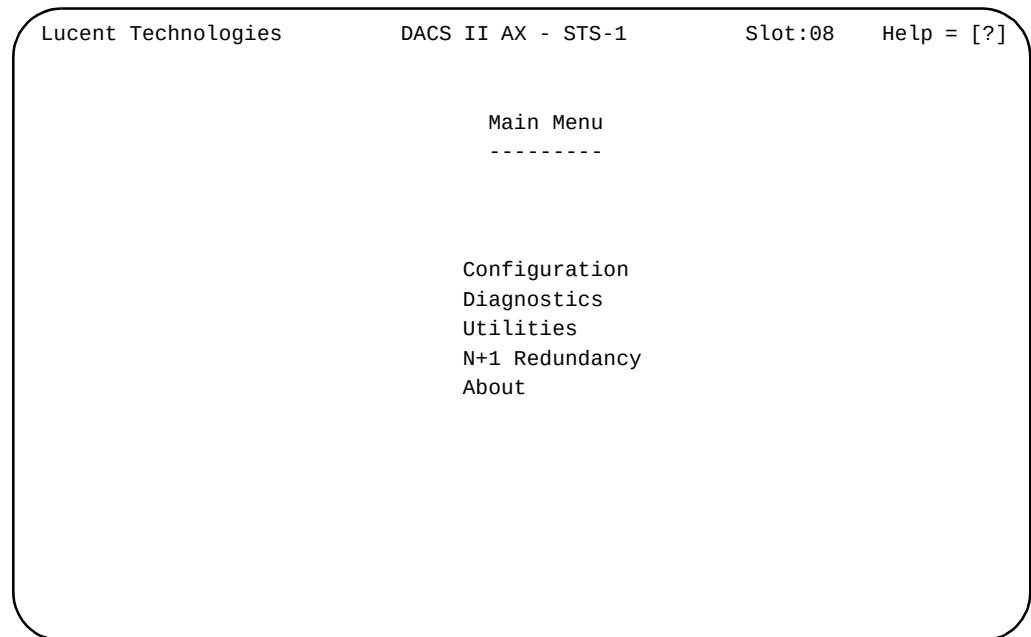


**Figure 21-7. STS-1 Main Menu**

From the *Main Menu* you can configure the module, run diagnostic tests, access utilities, view N+1 Redundancy status (DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware revision levels). These procedures are detailed on the following pages.

## Configuration Menu

The Configuration Menu provides access to submenus from which the Virtual Tributaries and the T1/E1 links can be configured.

**NOTE:**

The STS-1 configuration files are stored on the System Manager Card. When an STS-1 card is replaced, the old configuration is preserved.

**Configure Module** To configure the STS-1 module:

1. From the *Main Menu*, place your cursor on the *Configuration* field and press **<Enter>**. The following menu appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

Configuration Menu

STS-1 Configuration
T1/E1 Link Configuration
```

**Figure 21-8. Configuration Menu**

The *Configuration Menu* has two options:

- Select *STS-1 Configuration* to map T1/E1 links into Virtual Tributaries (VT).
- Select *T1/E1 Link Configuration* to configure the T1/E1 links.

## STS-1 Configuration

**NOTE:**

The STS-1 Configuration must be set up prior to configuring the T1 links. E1 is not supported for this release.

One of the benefits of SONET is that it can carry large payloads (above 50 Mbps). Existing T1 and E1 links can also be accommodated, which protects investments in existing equipment.

Each T1 or E1 link is mapped into a Virtual Tributary (VT) group, which is part of the SONET payload structure. Up to 4 T1 links can be mapped into a SONET VT-1.5 that associates each bit of the T1 with a location in the VT-1.5, and up to 3 E1 links can be mapped into a SONET VT-2 that associates each bit of the E1 with a location in the VT-2. A VT group will always consist of links of the same type.

### Configure VTs

To configure the virtual tributaries:

1. From the *Configuration Menu*, place your cursor on the *STS-1 Configuration* field and press **<Enter>**. The following submenu appears:

| VT Group# | Type         |                                |
|-----------|--------------|--------------------------------|
| 1:        | VT-1.5 (DS1) | Clocking.....: Internal        |
| 2:        | VT-1.5 (DS1) | Short Cable.....: Enable       |
| 3:        | VT-1.5 (DS1) | VT Mapping.....: Standard (VT) |
| 4:        | VT-1.5 (DS1) |                                |
| 5:        | VT-1.5 (DS1) |                                |
| 6:        | VT-1.5 (DS1) |                                |
| 7:        | VT-1.5 (DS1) |                                |

**Figure 21-9. STS-1 Configuration Submenu**

Refer to the field descriptions on the following page to assist you in setting up the STS-1 virtual tributary configuration.

2. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

**NOTE:**

A VT group will always consist of 4 links, even if the fourth has been disabled (E1). For example, VT Group #1 consists of links 1-4, Group #2 consists of links 5-8, etc.



## STS-1 Configuration Field Descriptions

**VT Group#:** Displays the 3 or 4 link Virtual Tributary group number.

**Type:** (*option field*) Select either *VT-1.5* for T1 or *VT-2* for E1.  
(*VT-2* currently N/A).

**STS-1 Timing:** (*option field*) Select one of the following clock options for the STS-1:

- **Internal** - Uses DACS II AX timing (Free Run, Station Clock, or Line Timing from another DACS II AX port).
- **EC-1 Line** - STS-1 clock is provided via the 52 Mbps STS-1 data stream. This is the default setting.

**Short Cable:** (*option field*) Controls the line build out (attenuation level) of the STS-1 transmitter. Set to *Enable* when attached cable is less than 50 feet long.

**VT Mapping:** (*option field*) Select either *Standard* or *Sequential* (*Sequential* currently N/A).

## T1/E1 Links Configuration

**Configure T1 or E1 Links** To configure the T1 or E1 links:

1. From the *Configuration Menu*, place your cursor on the *T1/E1 Link Configuration* field and press **<Enter>**. The following submenu appears:

|                     |           |                           |         |         |                 |              |              |
|---------------------|-----------|---------------------------|---------|---------|-----------------|--------------|--------------|
| Lucent Technologies |           | DACS II AX - STS-1        |         | Slot:08 |                 | Help = [?]   |              |
|                     |           | T1/E1 Links Configuration |         |         |                 |              |              |
|                     |           | -----                     |         |         |                 |              |              |
| Nbr                 | Link Name | Clear<br>T1/E1            | Framing | FDL     | Network<br>Loop | Yel<br>Alarm | Idle<br>Code |
| ---                 | -----     | -----                     | -----   | -----   | -----           | -----        | ----         |
| 01                  | Link 01   | Framed                    | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 02                  | Link 02   | T1 Unfrm                  | T1 ESF  | N/A     | Disable         | No           | Busy         |
| 03                  | Link 03   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 04                  | Link 04   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 05                  | Link 05   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 06                  | Link 06   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 07                  | Link 07   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 08                  | Link 08   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 09                  | Link 09   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 10                  | Link 10   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 11                  | Link 11   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 12                  | Link 12   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 13                  | Link 13   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| 14                  | Link 14   | Disabled                  | T1 ESF  | 54016   | Disable         | No           | Busy         |
| [N]ext page         |           | [C]opy cfg to all         |         |         |                 |              |              |

**Figure 21-10. T1/E1 Links Configuration Submenu**

2. To change parameters for an individual link, move the cursor to the link to be changed and press **<Enter>**. The following submenu appears:

Lucent Technologies      DACS II AX - STS-1      Slot:08      Help= [?]

Link Configuration  
-----

Link Nbr.....: 1  
Name.....: Link 01  
Status.....: In Service  
Recover Time.: 3    seconds  
Clear T1/E1..: Disabled  
Framing.....: T1 ESF  
Network Loop.: Disabled  
Yellow Alarm.: No  
Unused DSO's.: Busy  
ESF Format...: 54016

**Figure 21-11. Link Configuration Submenu**

3. The above submenu appears when you select a link to configure. The fields shown on this submenu are described on the following pages.
4. Once the link is configured, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

## **Link Configuration Field Descriptions**

**Link Nbr (Link Number):** This field displays the Link Number (1-28) of the link that you are configuring.

**Name:** (*text field*) This is a user-defined field. Any name up to 20 alphanumeric characters can be entered to identify each link on the STS-1 Module. You may find it beneficial to use Virtual Tributary numbers to name the links.

**Status:** (*option field*) This field is used to select the state of the link. You can put the link(s) *In Service* or *Out of Service*.

**Recover Time:** (*option field*) This field is used to specify how quickly Red/Yellow alarms are cleared following the recovery of the given T1 facility (e.g., valid signal and framing present). Select either *3*, *10*, or *15* seconds.

**Clear T1/E1:** (*option field*) "Clear" refers to a condition where the module passes data through without reformatting it in any way (essentially, the module acts the same as a wire). The following selections are available:

- **Framed** - Allows alarms and statistics to be displayed.
- **Unframed** - Passes data without keeping track of alarms and statistics. Limited diagnostics functions are available.
- **Disabled** - Turns off Clear mode (uses standard framing pattern and detects all alarms/errors). All diagnostic functions are available.



**NOTE:**

When using Clear T1 (E1) mode, make the connection ensuring that 25 (32) DS0s have connections mapped (see Chapter 5 for details on connection mapping). This is necessary because of the way Clear T1/E1 mode operates, taking the framing bits from the first 24 (31) DS0s and sending them all out through the 25th (32nd) DS0.

**Framing:** (*option field*) This field enables you to select the line type for the link. The available selections are: *T1 ESF* and *T1 D4*. When *Clear T1/E1* is set to *Unframed*, the only available line type will only be *T1 Unfrm*.



**NOTE:**

E1 is not supported for this release.

**Network Loop:** *(option field)* **Selectable only in Clear T1/E1 Disabled mode.**

This parameter determines the STS-1 Module's ability to respond to diagnostic commands received from the network supplier. *Enabled* indicates that the STS-1 Module will respond to loop commands received from the network supplier, *Disabled* indicates that it will not respond.

**Yellow alarm:** *(option field)* **Selectable only in Clear T1/E1 Disabled mode.**

*Yes* causes the T1 circuit to discard data and send a yellow alarm if it is in a red alarm condition for three seconds. *Yes* must be chosen if the network supplier is a common carrier, such as a telephone company.

**Unused DS0's:** *(option field)* **Selectable only in Clear T1/E1 Disabled mode.**

This entry is used to select the state of unused DS0s as either *Busy* (All Ones) or *Idle* (0).

**ESF Format:** *(option field)* **Selectable only in Clear T1/E1 Disabled mode.**

This entry describes the types of ESF network commands to which the STS-1 Module responds. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between *54016* (AT&T Technical Reference 54016) and *T1.403* (ANSI specification T1.403).

---

## Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks and built-in BERT.

There are multiple loopback options. Each of the links can be independently looped back. The STS-1 line can also be looped back. Loopbacks can occur towards the line or towards the backplane. A depiction of various loop types is provided later in this chapter (Figure 20-3).

The built-in BERT generator and testers can be used along with loopbacks to test and determine the status of the STS-1 Module. They may also be used in conjunction with diagnostic facilities on other DACS II AX cards to qualify operation of the backplane connections.

### Perform Diagnostics on STS-1 Module

To view and perform diagnostics on the STS-1 module:

1. From the *Main Menu*, place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 Diagnostics Menu

 Line Diagnostics Center
 Line Interface Unit (LIU) Monitor
 Monitor Control Signals
```

**Figure 21-12. Diagnostics Menu**

2. Place your cursor on the option that you wish to select and press **<Enter>**.

**Diagnostics Menu  
Field Descriptions**

**Line Diagnostics Center:** Selecting this option will open the *Diagnostics Manager* submenu. From this submenu, line diagnostic options such as loopbacks and built-in BERT can be employed.

**Line Interface Unit (LIU) Monitor:** Selecting this option will open the *Line Interface Unit Monitor* display. This display is a read-only screen that allows viewing the status of loopbacks and errors.

---

## Diagnostics Manager

The Line Diagnostics Center is used to set up line diagnostics for the STS-1 Module.

### Perform Line Diagnostics

To perform Line Diagnostics:

1. From the *Diagnostics Menu*, place your cursor on the *Line Diagnostics Center* field and press **<Enter>**. The following submenu appears:

|                               |        |                    |                    |         |       |                            |              |            |         |
|-------------------------------|--------|--------------------|--------------------|---------|-------|----------------------------|--------------|------------|---------|
| Lucent Technologies           |        |                    | DACS II AX - STS-1 |         |       | Slot:08                    |              | Help = [?] |         |
| Diagnostics Manager           |        |                    |                    |         |       |                            |              |            |         |
|                               | DS1/E1 |                    | VT                 |         | Link  | Back                       | Bert Testing |            |         |
| Link Name                     | State  | ErrSecs            | State              | ErrSecs | Loop  | Loop                       | State        | Duration   | ErrSecs |
| -----+-----+-----+-----+----- |        |                    |                    |         |       |                            |              |            |         |
| (1,1)                         | OK     | 0                  | OK                 | 0       | Off   | Off                        | Off          | 0          | 0       |
| (2,1)                         | OK     | 0                  | OK                 | 0       | Off   | Off                        | Off          | 0          | 0       |
| (3,1)                         | OK     | 0                  | OK                 | 0       | Off   | Off                        | Off          | 0          | 0       |
| (4,1)                         | OOS    | 0                  | OK                 | 0       | Off   | Off                        | Off          | 0          | 0       |
| (5,1)                         | OOS    | 0                  | OK                 | 0       | Off   | Off                        | Off          | 0          | 0       |
| (6,1)                         | OOS    | 0                  | OK                 | 0       | Off   | Off                        | Off          | 0          | 0       |
| (7,1)                         | OOS    | 0                  | OK                 | 0       | Off   | Off                        | Off          | 0          | 0       |
| -----+-----+-----+-----+----- |        |                    |                    |         |       |                            |              |            |         |
| Mapper/LIU                    | OK     | 0                  | NA                 | NA      | Local | NA                         | Off          | 0          | 0       |
| -----+-----+-----+-----+----- |        |                    |                    |         |       |                            |              |            |         |
|                               |        |                    |                    |         |       |                            |              |            |         |
| [B]ert                        |        | [L]oop             |                    |         |       |                            |              |            |         |
| [E]xpose                      |        | [S]tatistics (ESF) |                    |         |       | [R]egisters (ESF)          |              |            |         |
| [C]lear counters              |        | [N]ext             |                    |         |       | [I]n service (toggle view) |              |            |         |

**Figure 21-13. Diagnostics Manager Submenu**

From the *Diagnostics Manager* submenu, a submenu may be viewed or invoked to perform additional diagnostic actions such as loopbacks, BERT, and viewing additional statistics. To view an additional 7 links (up to 28 total), press **N**. To clear counters for the mapper and all 28 links (including those not shown on the current screen), press **C**. The information contained in each field on the screen is detailed on the following pages.



## Diagnostics Manager Submenu Field Descriptions

### Link Fields

**Link Name:** Displays the name assigned to the link.

**DS1/E1 State:** This field displays the DS1 or E1 link's current status as one of the following:

- OK - In Service and functioning properly
- LOS - Loss of Signal
- AIS - Alarm Indication Signal
- LOF - Loss of Frame
- YEL - Yellow Alarm
- CFA - Change of Frame Alignment
- SEF - Severely Errored Frame
- TSLP - Transmit Slip
- RSLP - Receive Slip
- SLIP - Both Transmit and Receive Slip
- RED - Red Alarm
- OOS - Out of Service
- ERR - More than one of the above errors is present.

For explanations of the above conditions, see T1/E1 Link Status Field Descriptions, in the "Expose" section.

**DS1/E1 ErrSecs (Errored Seconds):** Displays the number of errored seconds that have occurred on the DS1 or E1 link since the last time that the counter was reset. The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second.

**VT State:** This field displays the VT line status as one of the following:

- OK - In Service and functioning properly
- ESOF - Elastic Store Overflow
- AIS - Alarm Indication Signal
- LOP - Loss of Pointer
- SIZE - Incorrect VT Size Bits
- LOC - Loss of Clock
- RAIS - Receive Alarm Indication Signal
- ERR - More than one of the above errors is present.

For explanations of the above conditions, see T1/E1 Link Status Field Descriptions, in the "Expose" section.

**VT ErrSecs (Errored Seconds):** Displays the number of errored seconds that have occurred on the Virtual Tributary since the last time that the counter was reset. The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second.

**Link Loop:** Displays the type of diagnostic loop that has been enabled, or displays *Off* if no loop has been enabled. A depiction of various loop types is provided later in this chapter (Figure 20-3).

**Back Loop (Backplane Loop):** *On* in this field indicates that a backplane loop is enabled. A depiction of various loop types is provided later in this chapter (Figure 20-3).

---

## Bert Fields

**Bert Testing State:** Displays the type of BERT that is currently running. If BERT is not enabled, then *Off* is indicated. See the section on BERT for a list of the possible displayed states.

**Bert Testing Duration:** Displays the amount of time (in seconds) that BERT has been enabled.

**Bert Testing ErrSecs:** Displays the number of errored seconds that have occurred since BERT was enabled.

---

**Mapper Fields**

**Mapper/LIU:** This field displays the Mapper/STS-1 Port's current status as one of the following:

- OK - In Service and functioning properly
- LOF - Loss of Frame
- OOF - Out of Frame
- LOS - Loss of Signal
- PAIS - Path Alarm Indication Signal
- LOMF - Loss of Multiframe
- LOP - Loss of Pointer
- OOS - Out of Service
- ERR - More than one of the above errors is present.

---

## Diagnostic Commands

---

The following are diagnostic tests and status displays that can be enabled on the module, links and Mapper/LIU. These tests can be run by placing your cursor on a numbered link or on the *Mapper/LIU* field and pressing a *hot key* (see bullets below):

- **[B] = Bert:** Allows you to select several pseudo-random test patterns for testing both the T1/E1 links and the LIU.
- **[E] = Expose:** Allows you to display the status of the link and run additional procedures such as reinitializing the T1/E1 framers and injecting known errors.
- **[C] = Clear Error Counters:** Allows you to clear all errored second and BERT counters.
- **[L] = Loop:** Allows you to enable several different loopbacks for both the T1/E1 links and the Mapper/LIU.
- **[S] = Statistics (ESF):** Allows you to view the *ESF Statistics Display*, which shows current and 24-hour statistics for the specific ESF link.
- **[R] = Registers (ESF):** Allows you to view the *ESF Registers Display*, which gives the same information as the *ESF Statistics Display* but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period.
- **[N] = Next:** Allows you to view an additional 7 links (up to 28 total).
- **[I] = In Service:** Allows you to view only those links that are currently in service.

The procedures for running diagnostics and viewing statistics are detailed on the next several pages.

---

## **BERT (Bit Error Rate Test)**

---

BERT is used to test the bit error rate of the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine transmission line quality. If a pattern match cannot be found, Errored Seconds counts are incremented to record the time during which a pattern lock in the receive path could not be established. For troubleshooting purposes, combining BERT with diagnostic loops is very useful in isolating problems within a circuit. BERT is available for both the links and for the LIU.

---

### **Before You Begin**

The link must be in service and Clear T1/E1 must be disabled in order to perform BERT.

---

**Perform BERT on a Link**

To perform BERT for a link:

1. Place your cursor on an active T1/E1 link in the *Diagnostics Manager* submenu and press **B**. The following submenu appears:

```

Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 Bit Error Test (BERT) Selection

 Link Number...: 1
 Link Name....: (1,1)
 Current BERT.: Off
 New BERT.....: Off

----- DS1/T1 ----- DS1/T1 -----
[2] Unfrm 2047 [B] Frm 2047
[3] Unfrm 2^15 [C] Frm 2^15
[4] Unfrm 2^20 [D] Frm 2^20
[5] Unfrm 2^23 [E] Frm 2^23
[6] Unfrm 2^11-7 0's limits [F] Frm 2^11-7 0's limits
[7] Unfrm 2^15-7 0's limits [G] Frm 2^15-7 0's limits
[8] Unfrm QRSS [H] Frm QRSS
[9] Unfrm 2^23-14 0's limits [I] Frm 2^23-14 0's limits

[0]ff
[A]ll 2047 (All T1/E1 links generate 2047 Bert Pattern)
[T[S]FM 2047 (TSFM -> Link and TSFM -> Backplane)

```

**Figure 21-14. Bert Selection Submenu**

The *BERT Selection* submenu has a list of several test patterns that you can choose.

**NOTE:**

The link must be in service and Clear T1/E1 must be disabled in order to perform BERT.

2. To select a BERT pattern, either place the cursor on the *New BERT* field and press **<Enter>** to cycle through the choices OR press the specific *hot key* indicated on the bottom of the menu. The selectable patterns and their corresponding *hot keys* are as follows:

## DS1/T1 BERT:

- **[2]** Unframed 2047
- **[3]** Unframed 2<sup>15</sup>
- **[4]** Unframed 2<sup>20</sup>
- **[5]** Unframed 2<sup>23</sup>
- **[6]** Unframed 2<sup>11</sup> - 7 0's limits
- **[7]** Unframed 2<sup>15</sup> - 7 0's limits
- **[8]** Unframed QRSS
- **[9]** Unframed 2<sup>23</sup> - 14 0's limits
- **[B]** Framed 2047
- **[C]** Framed 2<sup>15</sup>
- **[D]** Framed 2<sup>20</sup>
- **[E]** Framed 2<sup>23</sup>
- **[F]** Framed 2<sup>11</sup> - 7 0's limits
- **[G]** Framed 2<sup>15</sup> - 7 0's limits
- **[H]** Framed QRSS
- **[I]** Framed 2<sup>23</sup> - 14 0's limits

## Other Selections:

- **[O]** Off
- **[A]** All 2047 (All T1/E1 links generate 2047 Bert Pattern)
- **[S]** TSFM 2047 (TSFM -> Link and TSFM -> Backplane)

3. Press **X** to start the test. The following screen appears:

```

Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 Bit Error Test (BERT) Selection

 Link Number...: 1
 Li
 Cu *****
 Ne * * S
 * -MESSAGE! - *
 * *
 ---- DS1/T1 ----- * *
[2] Unfrm 2047 * Start New Test? *
[3] Unfrm 2^15 * *
[4] Unfrm 2^20 * *
[5] Unfrm 2^23 * Are you sure (Y/N)? *
[6] Unfrm 2^11-7 0's * *
[7] Unfrm 2^15-7 0's *****
[8] Unfrm QRSS
[9] Unfrm 2^23-14 0's limits [I] Frm 2^23-14 0's limits

[0]ff
[S] TSFM 2047 (TSFM -> Link and TSFM -> Backplane)

```

**Figure 21-15. Start New Test Screen**

4. Press **Y** to initiate the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *BERT Selection* submenu.
5. From the *BERT Selection* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.



**Stop BERT for a Link**

To stop the link BERT test:

1. From the *Diagnostics Manager* submenu, press **B** and the *BERT Selection* submenu appears.
2. With the cursor on the *New BERT* field, press the letter **O**.
3. Press **X** to stop the test.
4. When prompted: "Stop Bit Error Test? Are you sure (Y/N)?" Press **Y** to stop the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *BERT Selection* submenu.
5. From the *BERT Selection* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.

**Perform BERT for LIU**

To perform BERT for the LIU:

1. From the *Diagnostics Manager* submenu, place your cursor on the *Mapper/LIU* field and press **B**. The following submenu appears:

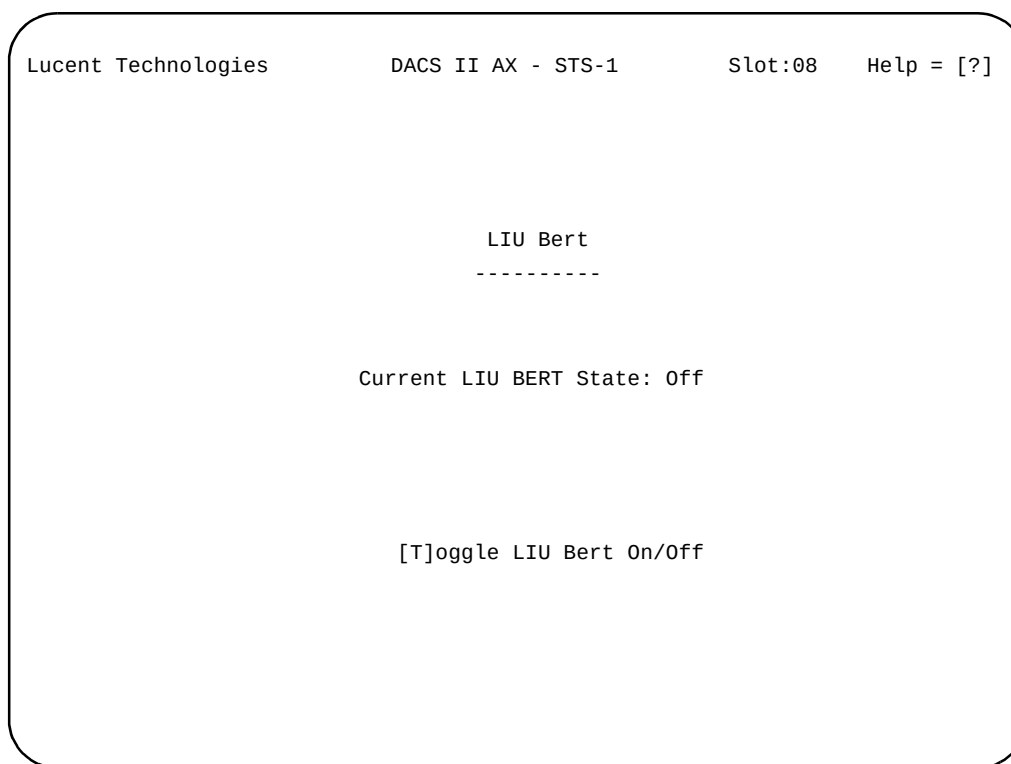


**Figure 21-16. LIU Bert Submenu**

2. Press **T** to toggle LIU BERT *On*.
3. Press **X** to start the test.
4. When prompted: "Start New Test? Are you sure (Y/N)?" Press **Y** to initiate the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *LIU Bert* submenu.
5. From the *LIU BERT* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.

**NOTE:**

LIU BERT uses D4 framing. The remote side must be configured as D4 in order for LIU BERT to run properly.

---

**Stop BERT on LIU**

To stop the LIU BERT test:

1. From the *Diagnostics Manager* submenu, place your cursor on the *Mapper/ LIU* field and press **B**. The *LIU Bert* submenu appears.
2. Press **T** to toggle LIU BERT *Off*.
3. Press **X** to stop the test.
4. When prompted: "Stop Bit Error Test? Are you sure (Y/N)?" Press **Y** to stop the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *LIU Bert* submenu.
5. From the *LIU Bert* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.

**NOTE:**

The data pattern can contain a significant number of errors and still be valid (inserted errors may not be seen).

## Expose

The *Expose* function is used to display the status of the T1/E1 links and STS-1 Mapper port, access G.826 statistics, reinitialize the framer, and insert errors for diagnostic purposes.

### View Status of T1/E1 Links

To view (Expose) the status of the T1/E1 links:

1. Place your cursor on an active T1/E1 link in the *Diagnostics Manager* submenu and press **E**. The following submenu appears:

```

Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 T1/E1 Link Status
Link Name.: T1 #1 ----- Link Number: 1

 DS1/E1 Status VT Status
 Error State ErrSecs Error State ErrSecs
-----+-----+-----
Red Alm: On 38743 Tx ESOF: Off 0 Crc Errors.....: 1023
Yel Alm: Off 0 Rx ESOF: Off 0 Bpv Errors.....: 0
LOS....: Off 0 AIS....: Off 0 Frm Bit Errors....: 4095
AIS Ind: On 38745 LOP....: Off 0 Trunk Conditioning.: Off
OOF....: On 38745 SIZE....: Off 0
SEF Ind: On 38745 LOC....: Off 0 Remote Bert ErrSecs: 0
Tx Slip: Off 1 VT AIS.: Off 0 Local Bert ErrSecs.: 0
Rx Slip: Off 1

[C]lear Counters ESF [S]tatistics ESF [R]egisters [G].826 Re[i]nitialize
----- Hit key 1 thru 9 to insert an error -----
[1]CAS Multiframe [2]Multiframe [3]PRBS [4]FBit
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All

```

**Figure 21-17. T1/E1 Link Status Submenu**

Some of the fields are context sensitive, (e.g., the CRC errors only appear for links that support CRC such as T1 ESF). An error-free link will display zeroes in all fields.

From the *T1/E1 Link Status* submenu, you can press:

- **C** to clear counters for the selected link
- **S** to view ESF Statistics
- **R** to view ESF Registers
- **G** to view G.826 Statistics, or
- **I** to reinitialize the T1/E1 framer.

You can also use keys **1** through **9** to insert errors from the NI side, which is then shown on the remote side. If the remote side is line looped, the inserted errors will be seen on the local side, under Errored Seconds. The information contained in each field on the screen is detailed on the following pages.

---

## **T1/E1 Link Status Field Descriptions**

### **DS1/E1 Status Fields**

**Link Name:** Contains the name of the specific link for which the status is being displayed.

**Error:** Displays the type of error on the specific DS1/E1 link for which the status is shown.

**State:** A display of *On* next to any of the *Error* entries indicates that an error condition currently exists on the DS1/E1 link. A display of *Off* indicates that the error condition is not present, but if the errored seconds field has a count, then this alarm has occurred sometime in the past (since the last time that the counter was cleared).



**NOTE:**

All Error and Alarm states will only be detected in Clear T1/E1 Disabled mode, except for LOS and BPV. LOS and BPV will also be detected in Clear T1/E1 Framed mode.

**ErrSecs (Errored Seconds):** The display count indicates the quantity of seconds that the error condition on the DS1/E1 link has been present or was present. Press **C** to clear the counters for this link.

**Red Alm (Red Alarm):** This field will display *On* if a loss of frame alignment has occurred and synchronization has been lost.

**Yel Alm (Yellow Alarm):** This field will display *On* if a Yellow Alarm has been generated by the network and sent to the customer premises. It usually means that the network is not correctly receiving the DACS II AX signal (the network is not in sync or a red alarm has occurred).

**LOS (Loss of Signal):** This field will display *On* to indicate a loss of signal detection. No DS1 or E1 signal is present on the RX pair to the DACS II AX.

**AIS Ind (Alarm Indication Signal Indication):** This field will display *On* if an unframed "all ones" condition has been detected.

**OOF (Out of Frame):** This field will display *On* to indicate that the received link data stream does not meet pre-set framing criteria.

**SEF Ind (Severely Errored Frame Indication):** This field will display *On* if the receive signal does not meet the requirements of ANSI T1.231.

**Tx Slip (Transmit Slip):** This field will display *On* to indicate that slip has been detected in the transmit path.

**VT (Virtual Tributary) Status**

**Rx Slip (Receive Slip):** This field will display *On* to indicate that slip has been detected in the receive path.

**Error:** Displays the specific type of Virtual Tributary error being reported.

**State:** A display of *On* next to any of the *Error* entries indicates that an error condition currently exists on the Virtual Tributary. A display of *Off* indicates that the error condition is not present, but if the errored seconds field has a count, then this alarm has occurred sometime in the past (since the last time the counter was cleared).

**ErrSecs (Errored Seconds):** The display count indicates the quantity of seconds that the error condition on the Virtual Tributary has been present or was present since the last time the counters were cleared. The counters can be cleared by pressing **C**.

**Tx ESOF (Transmit Elastic Store Overflow):** This field will display *On* if an elastic store overflow has been detected on the transmit side.

**Rx ESOF (Receive Elastic Store Overflow):** This field will display *On* if an elastic store overflow has been detected on the receive side.

**AIS (Alarm Indication Signal):** This field will display *On* if an alarm indication signal has been detected on the currently displayed link.

**LOP (Loss of Pointer):** This field will display *On* if several consecutive invalid pointers have been detected in the VT path.

**SIZE:** This field will display *On* if incorrect VT size bits have been detected. Valid VT size bits are 11 for VT-1.5 and 10 for VT-2.

**LOC (Loss of Clock):** This field will display *On* if a loss of clock has been detected on the link.

**VT AIS (Virtual Tributary Alarm Indication Signal):** This field will display *On* if an alarm indication signal has been detected on a virtual tributary (link) other than the one currently displayed. When this occurs, return to the *Diagnostics Manager* submenu and check the *State* of each link to determine which of the links is in an error state.

**Crc Errors (Cyclic Redundancy Check Errors):** This field is a counter that records the number of CRC6 block errors that have been detected. The test is a 6-bit algorithm that checks the content of the entire superframe. The D4 framing does not include CRC6; DACS II AX replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance.

**Bpv Errors (Bipolar Violation Errors):** This field is a counter that records the number of Bipolar Violations that have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.

**Frm Bit Errors (Framing Bit Errors):** This field is a counter that records the number of frame alignment bit errors that have been detected. This does not mean that synchronization has been lost.

**Trunk Conditioning:** If trunk conditioning status is *On* and the control bits indicate a red or yellow alarm is being received, the following occurs:

- Receive data is disabled at all DS0s.
- Idle code is written to corresponding slip buffer according to content of each timeslot (data/voice).

If trunk conditioning status is *Off*, then no alarms are being received.

**Remote Bert ErrSecs:** Displays the number of errored seconds resulting from BERT patterns not being returned from the direction of the backplane.

**Local Bert ErrSecs:** Displays the number of errored seconds resulting from BERT patterns not being returned from the direction of the link.

---

**View Status of  
STS-1 Link**

To view (Expose) the status of the STS-1 link:

1. From the *Diagnostics Manager* submenu, place your cursor on the *Mapper/LIU* field and press **E**. The following submenu appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 STS1 Mapper Link Status

----- Error State -----|-- Error Seconds --
Loss Of Signal.: Off 0
Out Of Frame...: Off 7
Loss Of Frame...: Off 0
Loss Of Pointer: Off 1
Path AIS.....: Off 0
Multi Frame....: Off 9
Rx Trace Error.: Off 2

[C]lear Counters
```

**Figure 21-18. STS-1 Mapper Link Status Submenu**

From the *STS-1 Mapper Link Status* submenu, the only action that is available is pressing **C** to clear the counters for the mapper link. The information contained in each field on the screen is detailed on the following pages.



---

## STS-1 Mapper Link Status Field Descriptions

---

**Loss Of Signal:** This field will display *On* to report a loss of signal detection. No STS-1 signal is present on the RX pair to the DACS II AX.

**Out Of Frame:** This field will display *On* to report that the received STS-1 data stream does not meet pre-set framing criteria.

**Loss Of Frame:** This field will display *On* to report an out-of-frame condition that has persisted for more than 3 milliseconds.

**Loss Of Pointer:** This field will display *On* if a loss of STS-1 pointer has been detected.

**Path AIS:** This field will display *On* to report that an Alarm Indication Signal has been detected in the receive path.

**Multi Frame:** This field will display *On* to report a loss of H4 byte multiframe indication.

**Rx Trace Error:** Trace is used by the receiving terminal to verify the path connection. This field will display *On* to indicate an error has been detected in the receive path trace (J1) byte.

---

## G.826 Statistics

This status screen displays the statistics of the performance of the selected T1/E1 link for the duration of time that the link is up and running.

### Access G.826 Statistics

To access the G.826 Statistics screen:

1. From the *T1/E1 Link Status* submenu, press **G**. The following display appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 G.826 Statistics

Link#: 1
Total Time.....: 355
Errored Seconds.....: 1
Error Free Seconds.....: 354
Severely Errored Seconds.....: 0
Consecutive Severely Errored Seconds: 0
Consecutive Error Free Seconds.....: 354
Background Errored Seconds.....: 1
Errored Seconds Ratio.....: 0.0028
Severely Errored Seconds Ratio.....: 0.0000
Background Errored Seconds Ratio....: 0.0028

[C]lear Counters
```

**Figure 21-19. G.826 Statistics Display**

The *G.826 Statistics* display is a read-only screen. The only action that can be accomplished here is pressing **C** to clear the counters. Descriptions for each field on this screen are supplied on the following pages.

## **G.826 Statistics Field Descriptions**

---

Refer to the ITU-T Standardized Specifications, dated 08/96, for a more detailed description of the G.826 statistics.

**Link #:** Displays the number of the link for which the status is being presented.

**Total Time:** Displays the amount of time (in seconds) that the link has been up and running.

**Errored Seconds:** A one-second period with one or more errored blocks or at least one defect is known as an errored second. This field displays the number of errored seconds that have occurred since the last counter reset.

**Error Free Seconds:** A one-second period of time during which the link was error free. This field represents the number of errored free seconds that have occurred.

**Severely Errored Seconds:** A subset of errored seconds, a one-second period in which more than 30% of the blocks contain errors is known as a severely errored second. This field displays the number of severely errored seconds that have occurred since the last counter reset.

**Consecutive Severely Errored Seconds:** A continuous occurrence of severely errored seconds, in one-second intervals, which contain >30% or more errored blocks. This field represents the number of consecutive severely errored seconds that have occurred since the last counter reset.

**Consecutive Error Free Seconds:** A display of consecutive one-second period intervals that did not have defects or errors on the link. This field displays the number of consecutive errored free seconds that have occurred since the last counter reset.

**Background Errored Seconds:** A one second period with one or more errored blocks or at least one defect not occurring as part of the errored seconds. This field displays the number of background errored seconds that have occurred since the last counter reset.

**Errored Seconds Ratio:** Displays the ratio of errored seconds to total seconds in available time during a fixed measurement interval.

**Severely Errored Seconds Ratio:** Displays the ratio of severely errored seconds to total seconds in available time during a fixed measurement interval.

**Background Errored Seconds Ratio:** Displays the ratio of background block errors to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during severely errored seconds.

---

## Reinitialize

The Reinitialize function is used to reset the T1/E1 framer to its default values. It will only reset the framer, not the entire module.



### CAUTION:

*Reinitializing the framer will cause data to be momentarily corrupted for all 8 links residing in that framer.*

### Reinitialize Framer

To reinitialize the framer:

1. From the *T1/E1 Link Status* submenu, press **I**. The following screen appears:

```

Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 T1/E1 Link Status
Link Name.: #1\ ----- Link Number: 1

 DS1/E1 Stat
Error State Er *****
----- *
Red Alm: Off 0 * -MESSAGE!- *: 0
Yel Alm: Off 0 * * *: 0
LOS....: Off 0 * * *: 0
AIS Ind: Off 0 * Are you sure to reinitialize the framer? * ning.: Off
OOF....: Off 0 * * *
SEF Ind: Off 0 * * * rSecs: 0
Tx Slip: Off 0 * Are you sure (Y/N)? * Secs.: 0
Rx Slip: Off 0 * * *

[C]lear Counters ESF [S]tatistics ESF [R]egisters [G].826 Re[i]nitialize
----- Hit key 1 thru 9 to insert an error -----
[1]CAS Multiframe [2]Multiframe [3]PRBS [4]FBit
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All

```

**Figure 21-20. Reinitialize Framer Screen**

2. Press **Y**. The T1/E1 framer will be reinitialized, and you are returned to the *T1/E1 Link Status* submenu. Press **N**, and you are returned directly to the *T1/E1 Link Status* submenu without the framer being reinitialized.
-

## Inserting Errors

---

For diagnostic purposes, specific errors can be inserted and momentarily transmitted either directly to a remote unit or looped back to the STS-1 module.

### Insert Errors

To insert errors:

1. From the *T1/E1 Link Status* submenu, press the specific numeric key indicated on the bottom of the menu to insert a momentary error. The errors and their corresponding *hot keys* are as follows:
  - **[1]** CAS Multiframe
  - **[2]** Multiframe
  - **[3]** PRBS
  - **[4]** FBit
  - **[5]** Frame Alignment
  - **[6]** Line Code Violation
  - **[7]** Bit Slip
  - **[8]** CRC
  - **[9]** All

## Diagnostic Loops

Link Loops available for the STS-1 Module include several types of Network Interface Loops (Local, Line, Remote, Payload, or All Local) as well as a Backplane Loop. These Loops can be enabled from the *Loop Selection* screen as detailed below. Also available are Mapper/LIU Loops, which are detailed following the Link Diagnostic Loop section.

### Select Loop for T1/E1 Link

To select a link diagnostic loop:

1. From the *Diagnostics Manager* submenu, place your cursor on the T1/E1 link you wish to place into loopback and press **L**. The following submenu appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 Link: 1

 Loop Selection Screen

 NI Loop Type : Off
 Backplane Loop : Off

T1/E1 Loop Type : [0]ff [L]ocal Li[n]e [R]emote [P]ayload

 [1]All Local
 [2]All Line

Backplane Loop: [T]oggle
```

**Figure 21-21. Loop Selection Screen**



2. To select a specific loop, either place the cursor on the *NI Loop* field and press **<Enter>** to cycle through the choices OR press the specific key indicated on the bottom of the menu. The selectable NI loops and their corresponding keys are as follows:

- **[L]** - to put a T1/E1 link into Local Loop
- **[N]** - to put a T1/E1 link into Line Loop
- **[R]** - to put a T1/E1 link into Remote Loop
- **[P]** - to start a Payload Loop
- **[1]** - to put all T1/E1 links into Local Loop
- **[2]** - to put all T1/E1 links into Line Loop
- **[T]** - to toggle the Backplane Loop *On* or *Off*

**NOTE:**

There must be a connection to another module or to the STS-1 Module itself mapped on the backplane in order for the backplane loop to function.

## Diagnostic Loops

A depiction of the loop types for the STS-1 module is shown in Figure 21-22.

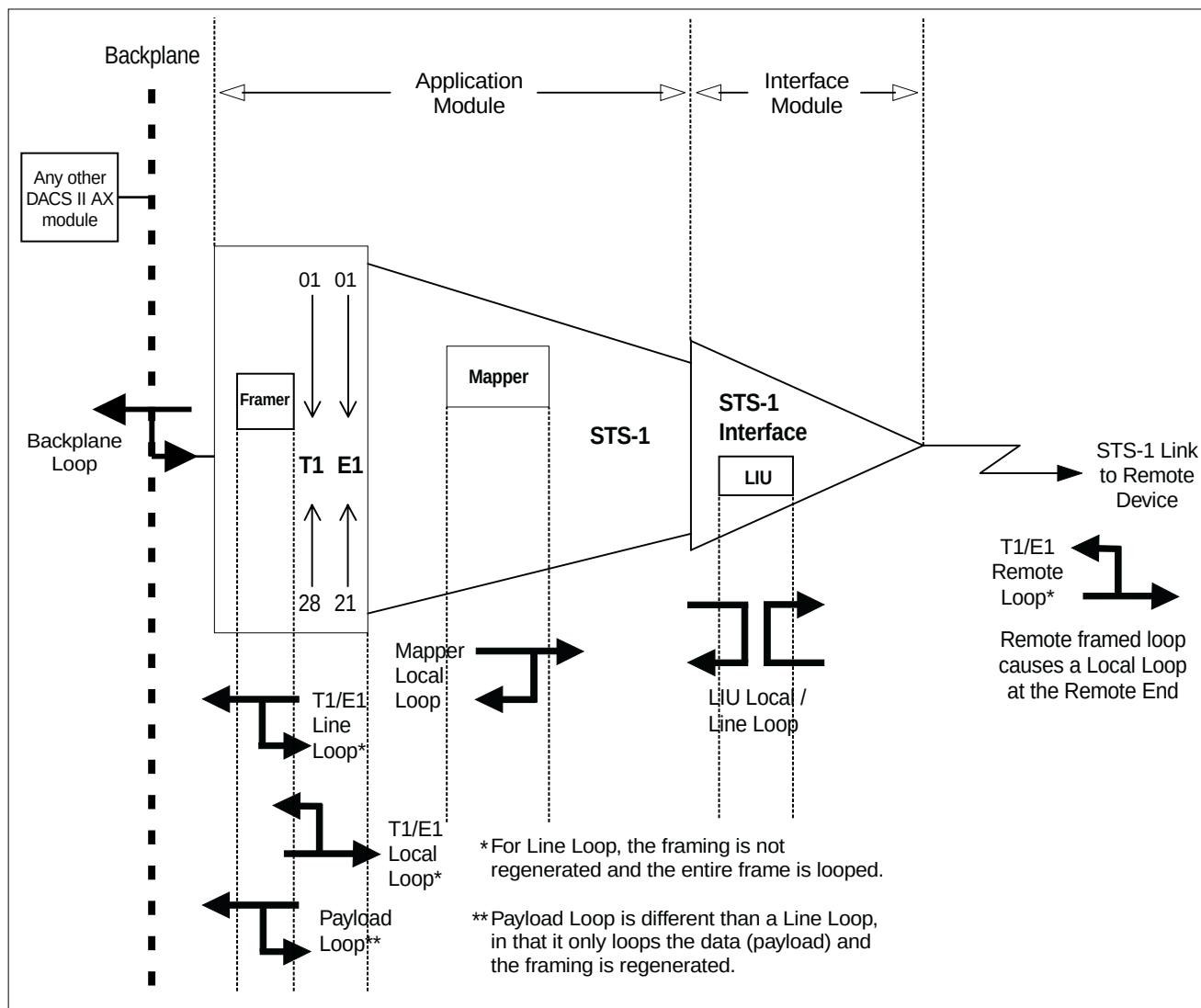


**Figure 21-22. STS-1 Module Loops**

3. Once you have selected a loop, press **X** to enable it. The following screen appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 Link: 1

* *
* -MESSAGE! - *
* *
* Process Loop Command? *
* *
T1/E1 Loop Type : [0] * * ad
* Are you sure (Y/N)? *
[1] * *
[2] *****

Backplane Loop: [T]oggle
```

**Figure 21-23. Process Loop Screen**

4. Press **Y** to initiate the loop, and you are returned to the *Diagnostics Manager* submenu. Press **N** to exit and return to the *Diagnostics Manager* submenu.

## Loop Selection Screen Field Descriptions

---

**Local Loop:** Local Loop causes data from the DACS II AX to be looped back to itself at the Network Interface port.

**Line Loop:** Line Loop causes frames at the NI to be looped back towards the network from the DACS II AX unit where the command was entered. The framing is not regenerated. In a point-to-point circuit, Line Loop is useful for looping back any testing initiated by the other end.

**Remote Loop:** Remote Loop causes a loop at the distant end of a point-to-point circuit, and is useful for looping back testing initiated from the local side.

**Payload Loop:** A Payload Loop is very similar to a Line Loop, except that it only loops the data (payload) and the framing is regenerated.



**NOTE:**

Payload loop will not function when using Clear T1/E1 Unframed mode.

**Off:** No loop is enabled.

**All Local:** Causes all T1/E1 links to be sent into local loopback.

**Backplane Loop:** Backplane Loop is designed to check the integrity of the backplane and allow testing through the STS-1 port from the remote side to the backplane and back to the tester. Select *Yes* to enable the backplane loop, and *No* to disable the backplane loop.

---

**Select Loop for Mapper/LIU**

To select a Mapper/LIU Diagnostic loop:

1. From the *Diagnostics Manager* submenu, move your cursor to the *Mapper/LIU* field and press **L**. The following submenu appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

Mapper/LIU Loop Selection Screen

Current Loop Type: Local

[O]ff = Mapper and LIU Off
[L]ocal = Mapper in Local Loop
LI[U] = LIU in Local and Line Loop
```

**Figure 21-24. Mapper/LIU Loop Selection Screen**

2. To select a specific loop, either place the cursor on the *Loop Type* field and press **<Enter>** to cycle through the choices OR press the specific key indicated on the bottom of the menu. The selectable Mapper/LIU Loops and their corresponding *hot keys* are as follows:
  - **[O]** - to turn off Mapper and LIU Loops
  - **[L]** - to put the Mapper into Local Loop
  - **[U]** - to put the LIU in Local and Line Loop
3. Once you have selected a loop, press **X** to enable it.
4. When prompted: "Process Loop Command? Are you sure (Y/N)?" Press **Y** to initiate the loop and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *Diagnostics Manager* submenu.

## ESF Statistics

The ESF Statistics display is a read-only screen. It allows you to view both current and 24-hour ESF Statistics. The Current Statistics column displays the counts for the current time interval (maximum 15 minutes). The 24 Hour Statistics column displays the counts for the preceding 24-hour period.

### View ESF Statistics

To view ESF statistics:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable link, and press **S**. The *ESF Statistics* display for the selected link appears.

**NOTE:**

ESF Statistics can also be displayed from the T1/E1 Link Status submenu by pressing **S**.

Lucent Technologies

DACS II AX - STS-1

Slot:08

Help = [?]

ESF Statistics For Link#: 1

| Register                  | Curr     | 24 Hr |
|---------------------------|----------|-------|
| -----                     |          |       |
| Errored seconds.....      | 0        | 1     |
| Failed seconds (UAS)....  | 389      | 2691  |
| Severely errored seconds: | 0        | 1     |
| Bursty errored seconds..  | 0        | 0     |
| Loss of frame count.....  | 0        | 0     |
| Time in interval.....     | 389      |       |
| # Valid intervals.....    | 3        |       |
| ESF status.....           | FU000000 |       |

**Figure 21-25. ESF Statistics Display**

## ESF Statistics Display Field Descriptions

**Errored Seconds:** The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred.

**Failed Seconds (UAS):** Each one-second period during the occurrence of a Failed Signal State (10 consecutive errored seconds) is known as a failed second. This field displays the number of failed seconds that have occurred.

**Severely Errored Seconds:** A one-second period in which 320 or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.

**Bursty Errored Seconds:** A one-second period in which more than one but less than 320 CRC6 errors have occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

**Loss of Frame Count:** A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

**Time in Interval:** A timer that tracks the number of seconds (0-900) in one 15-minute interval.

**# Valid Intervals:** A counter that tracks the total number of 15-minute intervals in a 24 hour period (up to 96).

**ESF Status:** This field defines the status of the T1/E1 line. The status is defined by an 8-digit number that is described below:

example: F00000L0

Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.

Digit #2 - "U" or "0" where "U" indicates an unavailable signal state.

Digit #3 through #6 and #8 are always "0."

Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.

## ESF Registers

The *ESF Registers Display* is a read-only screen. It displays the same information as the *ESF Statistics Display*, but it is broken down by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

### View ESF Registers

To view ESF Registers:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable link and press **R**. The *ESF Registers* display for the selected link appears. Press **N** to view the next 48 intervals.



#### NOTE:

ESF Registers can also be displayed from the T1/E1 Link Status submenu by pressing **R**.

|                            |     |     |     |     |                    |     |     |     |     |         |     |     |     |     |            |  |  |  |  |
|----------------------------|-----|-----|-----|-----|--------------------|-----|-----|-----|-----|---------|-----|-----|-----|-----|------------|--|--|--|--|
| Lucent Technologies        |     |     |     |     | DACS II AX - STS-1 |     |     |     |     | Slot:08 |     |     |     |     | Help = [?] |  |  |  |  |
| ESF registers For Link#: 1 |     |     |     |     |                    |     |     |     |     |         |     |     |     |     |            |  |  |  |  |
| INT                        | ES  | FS  | SES | BES | INT                | ES  | FS  | SES | BES | INT     | ES  | FS  | SES | BES |            |  |  |  |  |
| -----                      |     |     |     |     |                    |     |     |     |     |         |     |     |     |     |            |  |  |  |  |
| 01.                        | 000 | 900 | 000 | 000 | 17.                | 000 | 000 | 000 | 000 | 33.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 02.                        | 000 | 900 | 000 | 000 | 18.                | 000 | 000 | 000 | 000 | 34.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 03.                        | 001 | 891 | 001 | 000 | 19.                | 000 | 000 | 000 | 000 | 35.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 04.                        | 000 | 000 | 000 | 000 | 20.                | 000 | 000 | 000 | 000 | 36.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 05.                        | 000 | 000 | 000 | 000 | 21.                | 000 | 000 | 000 | 000 | 37.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 06.                        | 000 | 000 | 000 | 000 | 22.                | 000 | 000 | 000 | 000 | 38.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 07.                        | 000 | 000 | 000 | 000 | 23.                | 000 | 000 | 000 | 000 | 39.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 08.                        | 000 | 000 | 000 | 000 | 24.                | 000 | 000 | 000 | 000 | 40.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 09.                        | 000 | 000 | 000 | 000 | 25.                | 000 | 000 | 000 | 000 | 41.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 10.                        | 000 | 000 | 000 | 000 | 26.                | 000 | 000 | 000 | 000 | 42.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 11.                        | 000 | 000 | 000 | 000 | 27.                | 000 | 000 | 000 | 000 | 43.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 12.                        | 000 | 000 | 000 | 000 | 28.                | 000 | 000 | 000 | 000 | 44.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 13.                        | 000 | 000 | 000 | 000 | 29.                | 000 | 000 | 000 | 000 | 45.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 14.                        | 000 | 000 | 000 | 000 | 30.                | 000 | 000 | 000 | 000 | 46.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 15.                        | 000 | 000 | 000 | 000 | 31.                | 000 | 000 | 000 | 000 | 47.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| 16.                        | 000 | 000 | 000 | 000 | 32.                | 000 | 000 | 000 | 000 | 48.     | 000 | 000 | 000 | 000 |            |  |  |  |  |
| [N]ext Page                |     |     |     |     |                    |     |     |     |     |         |     |     |     |     |            |  |  |  |  |

**Figure 21-26. ESF Registers Display**



---

## ESF Registers Field Descriptions

---

**INT (Interval):** The interval number for the ninety-six 15-minute intervals preceding the current interval, with *01* being the most recent.

**ES (Errored Seconds):** The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred.

**FS (Failed Seconds):** Each one-second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field displays the number of severely errored seconds that have occurred.

**SES (Severely Errored Seconds):** A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.

**BES (Bursty Errored Seconds):** A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

---

### View In Service Links Only

To view the links currently in service:

From the *Diagnostics Manager* submenu, press **I**. The display will refresh, and only those links which are currently in service will appear in the *Diagnostics Manager* submenu. Press the **I** key again, and all links are displayed.

---

## Line Interface Unit (LIU) Monitor

The Line Interface Unit (LIU) Monitor is used to observe the condition of the STS-1 line and report its status.

### View STS-1 Line Status

To view the STS-1 line status:

1. From the *Diagnostics Menu*, place your cursor on the *Line Interface Unit (LIU) Monitor* field and press **<Enter>**. The following display appears:

Lucent Technologies      DACS II AX - STS-1      Slot:08      Help = [?]

Line Interface Unit Monitor

|                    | State | Errored Seconds |
|--------------------|-------|-----------------|
|                    | ----- | -----           |
| Line Loop.....     | Off   |                 |
| Local Loop.....    | Off   |                 |
| Generate PRBS..... | Off   |                 |
| Transmit AIS.....  | Off   |                 |
| Short Cable.....   | On    |                 |
| Digital LOS.....   | Off   | 0               |
| Analog LOS.....    | Off   | 0               |
| Excess Zeros.....  | Off   | 0               |
| Coding Violation.. | Off   | 0               |
| PRBS Check.....    | Off   | 0               |

[C]lear counters

**Figure 21-27. Line Interface Unit Monitor Display**

2. The *Line Interface Unit Monitor* displays the status of the STS-1 line. The only option available is pressing **C** to clear counters. Descriptions of each field on this screen are supplied on the following page.

---

## Line Interface Unit Monitor Display Field Descriptions

---

**State:** Displays the state of the applicable field as either *Off* or *On*.

**Errored Seconds:** A one-second period with one or more errored blocks or at least one defect is known as an errored second. This field displays the number of errored seconds that have occurred for the applicable field.

The states of the following conditions are displayed:

**Line Loop:** *On* indicates that an LIU line loop has been enabled. A depiction of various loop types is provided earlier in this chapter (Figure 20-3).

**Local Loop:** *On* indicates that an LIU local loop has been enabled. A depiction of various loop types is provided earlier in this chapter (Figure 20-3).

**Generate PRBS:** PRBS (Pseudo-Random Binary Sequence) is a background test used to monitor the line when LIU BERT is enabled. *On* indicates that this signal is being generated and sent to a remote unit.

**Transmit AIS:** *On* indicates that an AIS (Alarm Indication Signal) is being transmitted to a remote unit.

**Short Cable:** *On* indicates that a short cable (<50') has been configured in the *Mapper/LIU Configuration* submenu.

**Digital LOS:** *On* indicates that the signal has been lost. Specifically, there have been 175 ( $\pm 75$ ) consecutive zeros in the data stream.

**Analog LOS:** *On* indicates that the signal has been lost. Specifically, less than 28% of the data stream is ones.

**Excess Zeros:** *On* indicates that excess zeros have been detected.

**Coding Violation:** *On* indicates that a violation has been detected in the B3ZS coding scheme.

**PRBS Check:** Indicates that the PRBS (Pseudo-Random Binary Sequence) is being received from the remote end is currently being checked. *On* indicates that the PRBS is being checked, while *Off* indicates that the PRBS is not being checked.

## Monitor Control Signals

The Monitor Control Signals option is used to observe the status of PCM signalling for the STS-1 Module's configured links.

### Monitor PCM Control Signals

To monitor PCM control signals:

1. From the *Diagnostics Menu*, place your cursor on the *Monitor Control Signals* field and press <Enter>. The following menu appears:

| Lucent Technologies |         | DACS II AX - STS-1          |     | Slot:08 | Help = [?] |
|---------------------|---------|-----------------------------|-----|---------|------------|
| Link:02             |         | PCM Signalling Display Menu |     |         |            |
| DS0                 | To Link | To Bus                      | DS0 | To Link | To Bus     |
| 01                  | A_C_    | A_C_                        | 17  | A_CD    | A_CD       |
| 02                  | A_CD    | A_CD                        | 18  | AB_     | AB_        |
| 03                  | AB_     | AB_                         | 19  | AB_D    | AB_D       |
| 04                  | AB_D    | AB_D                        | 20  | ABC_    | ABC_       |
| 05                  | ABC_    | ABC_                        | 21  | ABCD    | ABCD       |
| 06                  | ABCD    | ABCD                        | 22  | __D     | __D        |
| 07                  | __D     | __D                         | 23  | __C_    | __C_       |
| 08                  | __C_    | __C_                        | 24  | _CD_    | _CD_       |
| 09                  | _CD_    | _CD_                        | 25  | None    | None       |
| 10                  | _B_     | _B_                         | 26  | None    | None       |
| 11                  | _B_D    | _B_D                        | 27  | None    | None       |
| 12                  | _BC_    | _BC_                        | 28  | None    | None       |
| 13                  | ABC_    | ABC_                        | 29  | None    | None       |
| 14                  | A__     | A__                         | 30  | None    | None       |
| 15                  | A__D    | A__D                        | 31  | None    | None       |
| 16                  | A_C_    | A_C_                        | 32  | None    | None       |

**Figure 21-28. PCM Signalling Display Menu**

---

## PCM Signalling Display Field Descriptions

---

**DS0:** Displays the time slot (DS0) for which the status is being shown.

**To Link:** Displays the PCM signalling bit status (per ATT Technical Reference 43801) in the direction of the link.

- *None* indicates that the DS0 is not being used.
- *Data* indicates that the DS0 is being used to pass data.
- Voice traffic is indicated by the display of signalling bits in an ABCD format, depending upon the application. A letter (A,B,C, or D) indicates a logic "high" or one, while an underscore indicates a logic of "low" or zero.

**To Bus:** Displays the PCM signalling bit status (per ATT Technical Reference 43801) in the direction of the DACS II AX Bus.

- *None* indicates that the DS0 is not being used.
  - *Data* indicates that the DS0 is being used to pass data.
  - Voice traffic is indicated by the display of signalling bits in an ABCD format, depending upon the application. A letter (A,B,C, or D) indicates a logic "high" or one, while an underscore indicates a logic of "low" or zero.
-

## Utilities Menu

The Utilities Menu provides access to two submenus from which you can reset the STS-1 Module or set its status to *In Service* or *Out of Service*.

### Reset STS-1 Module

The Reset utility causes the STS-1 Module to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

**CAUTION:**

*Resetting the module will cause data to be momentarily corrupted.*

To reset the STS-1 module:

1. From the STS-1 *Utilities Menu*, place your cursor on the *Reset Board* field and press **<Enter>**. The following screen appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 Utilities Menu

* *
* -MESSAGE! - *
* *
* *
* Reset this STS1 board? *
* *
* *
* Are you sure (Y/N)? *
* *

```

**Figure 21-29. Reset Board Screen**

2. Press **Y** to reset the board. The next screen appears with the following message: "Alert! Please wait while we establish communications with the system manager! Press any key to continue." Wait a few seconds, and you are returned to the *Node Summary Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, the STS-1 Module's state will cycle through a combination of "Standby", and "Out of Service", and "On-line". This is a normal occurrence when the device resets. Wait for the Device State on the menu to display "On-line" before you proceed.

---

**Change Board Status**

The Board Status field allows the Administrator to put the STS-1 module *In Service* or *Out of Service*.

**NOTE:**

If a module is set to "Out of Service", you cannot enter the Diagnostics Menu.

**To change to Out of Service**

1. From the STS-1 *Utilities Menu*, select *Board Status* field and press **<Enter>**. If the board status is *In Service*, the following screen appears:

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 Utilities Menu

* *
* -MESSAGE!- *
* *
* Set device to Out Of Service? *
* *
* *
* Are you sure (Y/N)? *
* *

```

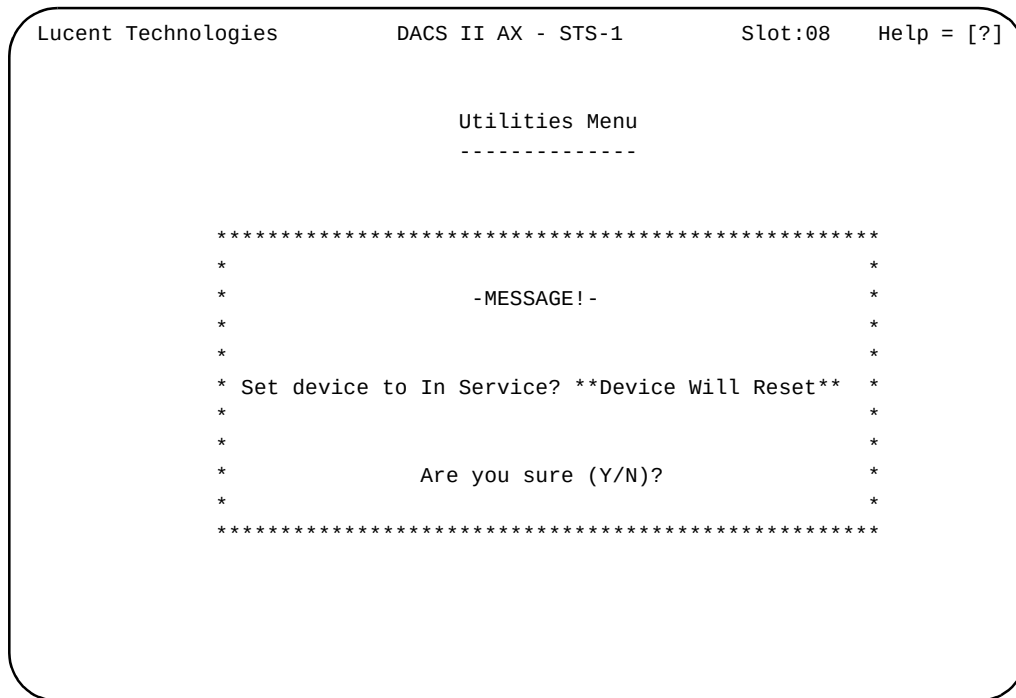
**Figure 21-30. Board Status Screen**

2. Press **Y**. The board is set to *Out of Service*, and you are returned to the *Utilities Menu*. If you press **N**, you return to the *Utilities Menu*.



**To change to In Service**

1. From the STS-1 *Utilities Menu*, select *Board Status* field and press **<Enter>**. If the board status was *Out of Service*, the following screen appears.

**Figure 21-31. Board Status Screen**

2. Press **Y**. The unit will be reset, the board will be set to "In Service", and you are returned to the *Node Summary Menu*. If you press **N**, you return to the *Utilities Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, the STS-1 Module's state will cycle through a combination of "Standby", "Out of Service" and "On-line". This is a normal occurrence when the device resets. Wait for the Device State on the menu to display "On-line" before you proceed.

## N+1 Redundancy Menu

The N+1 Redundancy Menu allows you to view N+1 Redundancy Status. It is applicable to DACS II AX-11 units equipped with the N+1 Protection Switch. For specific information and instructions on setting up your STS-1 device cards in a redundancy group, refer to Chapter 10, N+1 Redundancy.

### Display Redundancy Information

To display N+1 redundancy information:

1. From the *Main Menu*, move your cursor to the *N+1 Redundancy* field and press **<Enter>**. The following menu appears:

The screenshot shows a terminal window with a title bar containing 'Lucent Technologies', 'DACS II AX - STS-1', 'Slot:08', and 'Help = [?]'. The main content area displays the 'N+1 Redundancy Menu' with a dashed line separator, followed by the 'Device Redundancy' section.

```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

N+1 Redundancy Menu

Device Redundancy
```

**Figure 21-32. STS-1 Module N+1 Redundancy Menu**

2. Then place your cursor on the *Device Redundancy* field and press **<Enter>**. The following display appears:

Lucent Technologies      DACS II AX - STS-1      Slot:08      Help = [?]

N+1 Redundancy Status Menu

Redundancy...: Disabled  
Card Type...: Primary  
Device State: Online

|                                | State | Change Count |
|--------------------------------|-------|--------------|
| -----                          |       |              |
| Frame Sync Pulse.....:         | OK    | 0            |
| System Clock.....:             | OK    | 0            |
| Backplane Timeslot Management: | OK    | 0            |
| Communication with System Mgr: | OK    | 0            |
| Rear Card.....:                | OK    | 0            |
| Framers.....:                  | OK    | 0            |

**Figure 21-33. N+1 Redundancy Status Menu**

The *N+1 Redundancy Status* menu is a read-only screen. Descriptions for each field on this screen are supplied on the following page.

## N+1 Redundancy Status Field Descriptions

---

**Redundancy:** *Enabled* means that the STS-1 Module is a member of an N+1 Redundancy Group, while *Disabled* means that it is not a member of an N+1 Redundancy Group.

**Card Type:** Displays whether the STS-1 Module is configured as *Primary* or *Secondary*.

**Device State:** Displays the current state of the STS-1 Module as either *On-line*, *Off-line*, *Standby*, *Defective*, or *Bus Error*.

**State:** Displays the status of the following:

- **Frame Sync Pulse:** If the state is *Missing*, it indicates a loss of synchronization error.
- **System Clock:** If the state is *Missing*, it indicates a loss of system clock.
- **Backplane Timeslot Management:** If the state is *Invalid*, it indicates that the backplane is flooded with more timeslots than the card can handle.
- **Communication with System Mgr:** If the state is *Lost*, it indicates that the device has not received any messages from the SMC II for more than one minute.



**NOTE:**

If the state reads "Lost", you most likely have problems with your STS-1 Module, not the SMC II.

- **Rear Card:** If the state is *Missing*, it indicates the rear card is not being detected. The device will reset after the rear card is detected again.
  - **Framers:** If the state is *Bad*, it indicates one of the T1/E1 framers or the STS-1 mapper is bad (hardware failure).
-

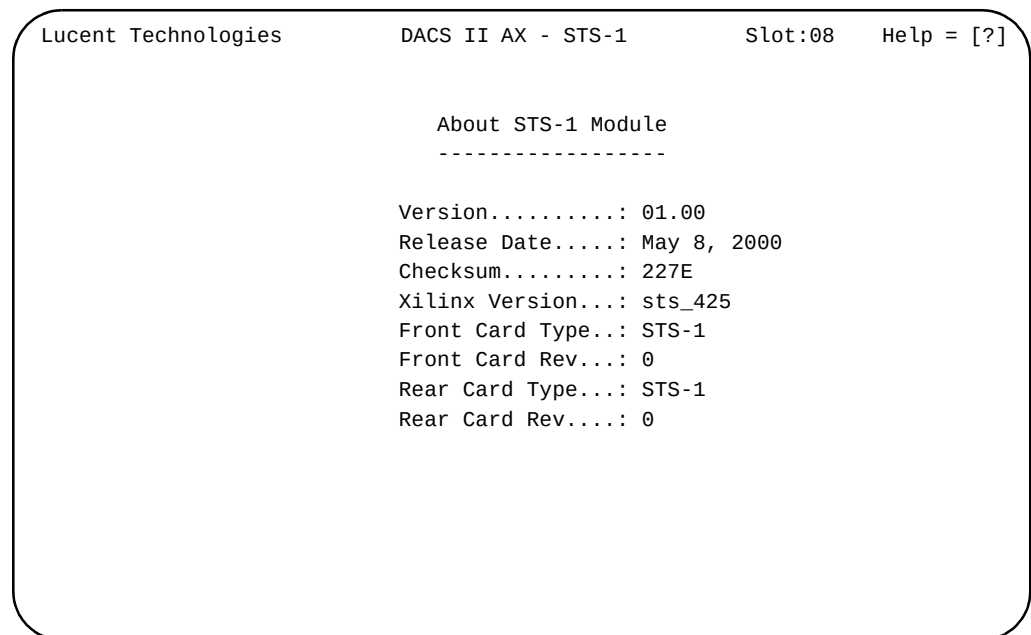
## About Menu

The About Menu displays version, release date, and checksum information for the STS-1 Module software, and version information for the STS-1 Module hardware.

### Display About Information

To display module identification information:

1. From the *Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following display appears:



```
Lucent Technologies DACS II AX - STS-1 Slot:08 Help = [?]

 About STS-1 Module

Version.....: 01.00
Release Date....: May 8, 2000
Checksum.....: 227E
Xilinx Version...: sts_425
Front Card Type...: STS-1
Front Card Rev...: 0
Rear Card Type...: STS-1
Rear Card Rev....: 0
```

**Figure 21-34. About STS-1 Module Display**

2. The *About STS-1 Module* display is a read-only screen. Descriptions for each field on this screen are supplied on the following page.

## About Menu Field Descriptions

---

**Version:** Displays the software version currently residing in the STS-1 Module's flash memory.

**Release Date:** Displays the date of software release.

**Checksum:** Displays the sum of all bytes in the STS-1 Module's flash memory at power up. Also used to identify software version.

**XILINX Version:** Displays the hardware version of downloadable, programmable devices.

**Front Card Type:** Displays the type of Application Module in the system.

**Front Card Rev:** Displays the Application Module's hardware revision level.

**Rear Card Type:** Displays the type of Interface Module in the system.

**Rear Card Rev:** Displays the Interface Module's hardware revision level.

---

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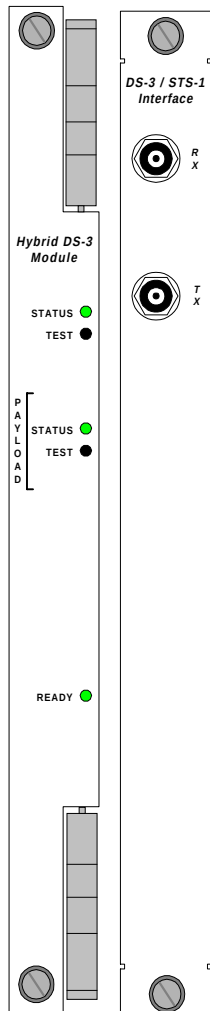
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## Physical Description

The Hybrid DS-3 module set allows the DACS II AX to connect to a DS-3 compatible link, and is capable of multiplexing up to 28 T1 links or 21 E1 links into a single DS-3 signal. It contains a microprocessor, and FLASH memory for program storage. The Hybrid DS-3 module assembly occupies a single backplane slot in the DACS II AX chassis. N+1 Redundancy for this module is available when it is utilized in a DACS II AX-11 chassis with the N+1 Protection Switch.



### NOTE:

A maximum of six Hybrid DS-3 module sets may be installed in the DACS II AX-11, based upon mapping up to 28 links per card for a total of 168 DS1s with all 24 DS0s mapped on each DS1. In fact, more than six module sets may be installed, although not all associated DS0s can be mapped due to insufficient backplane bandwidth.

The Hybrid DS-3 Module has extensive statistic gathering capability. Each of the T1/E1 framers can report sync status, frame errors, CRC errors, frame slips, and several link alarm conditions. The DS-3 framer can report sync status, line errors, code violations, C-bit parity, and link alarm conditions. In addition, the FDL and C-bit maintenance link protocols can accumulate statistics for their respective protocols.

The module set assembly comprises two circuit card modules: a Hybrid DS-3 Application Module that contains backplane, switching, and framing logic, and an Interface Module which provides electrical interface connections.

There are two groups of LEDs on the front card, one group for the DS-3 link and one group for the DS1 links, and a READY LED. These LEDs are discussed on the following page.

Thumb screws are provided at the top and bottom of the bezels to secure the modules in the chassis and to make an electrical connection to frame ground for regulatory emission compliance. The electrical connection to frame ground also protects the modules from static discharge.

**Figure 22-1. Hybrid DS-3 Application/Interface Module Set**

## LED Descriptions

---

**STATUS - Mapper/  
LIU**

**STATUS** (Mapper/LIU) - Green indicates the Mapper/LIU port is operational and functional. Red indicates that the Mapper/LIU port was in error during the last second. This may be due to one of the following:

- Invalid configuration.
  - Framer is bad.
  - Cable is bad or missing.
  - Rear interface card is bad.
- 

**TEST - Mapper/  
LIU**

**TEST** (Mapper/LIU) - Solid yellow indicates the Mapper/LIU is in a loopback condition or LIU BERT is enabled. Flashing yellow indicates that the LIU is in error from the LIU BERT.

---

**STATUS - Payload**

**STATUS** (Payload) - Solid green indicates all in-service T1/E1 links are operational and functioning properly. Solid red indicates that one or more of the T1/E1 links was in error during the last second. This may be due to one of the following:

- Invalid configuration.
  - Framer is bad.
  - Cable is bad or missing.
  - Rear interface card is bad.
- 

**TEST - Payload**

**TEST** (Payload) - Solid yellow indicates that one or more of the T1/E1 links is in a loopback condition or link BERT is enabled. Flashing yellow indicates that that one or more of the T1/E1 links is in error from the link BERT.

---

**READY**

**READY** - Green indicates that the device is in an online state or defective state. Flashing green indicates that the device is in standby state. Solid red indicates that the device is in bus error state. Flashing red indicates that the device is in offline state.

---

**ALL LEDs**

If all LEDs are cascading from top to bottom, the unit is downloading software to its memory chip.

If all LEDs are off except the "Ready" LED, it indicates that all links are Out of Service.

If all LEDs are flashing, it indicates that the rear interface module is missing or the device is being forced Out of Service.

---

---

## Regulatory Information

---

### North America

The Hybrid DS-3 Module is designed to comply with the requirements of Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference.

Shielded cables should be used with this unit to ensure compliance with the Class A limits. In addition, the Interface Module must be secured to the chassis by means of firmly tightening securing screws on the bezel.

This Class A digital apparatus is designed to meet all requirements of the Canadian Interference Causing Equipment Regulations.

---

### Product Safety

This equipment is designed to meet the safety requirements of the Underwriters' Laboratories (UL) bi-national standard UL 1950, Third Edition.

---

### Europe

This equipment is designed to be in conformity with the following standard(s) or other normative document(s):

EN55022, Class A, 1994

EN50082-1, 1991 (EN61000-4-2, EN61000-4-3, EN61000-4-4)

EN60950:1992

following the provisions of the EMC directive 89/336/EEC, the Low voltage directive 73/23/EEC, and the TTE directive 91/263/EEC.

---

---

## Before You Begin

---

- This chapter is written for ADMINISTRATOR-level users.
  - A slot must be configured for the module type and the Hybrid DS-3 module must be resident in a slot in the equipment chassis. A Hybrid DS-3 interface module must also be resident in the same numbered slot as the Hybrid DS-3 application module.
  - Screens are shown for a DACS II AX with the SMC II module. Screens may vary for the Hybrid DS-3 Module supported by SMC I. The differences appear on the Slot Configuration Menu, Slot Configuration Submenu, and Node Summary Menu, as well as anything to do with N+1 Redundancy.
  - For cabling and interface requirements, refer to Appendix B.
-

## Slot Configuration

### Configure Slot for Hybrid DS-3 Module

To configure a slot or change a slot configuration for the Hybrid DS-3 module:

1. From the DACS II AX *Main Menu*, select *System Configuration*. The System Configuration Menu displays (Figure 22-2).L

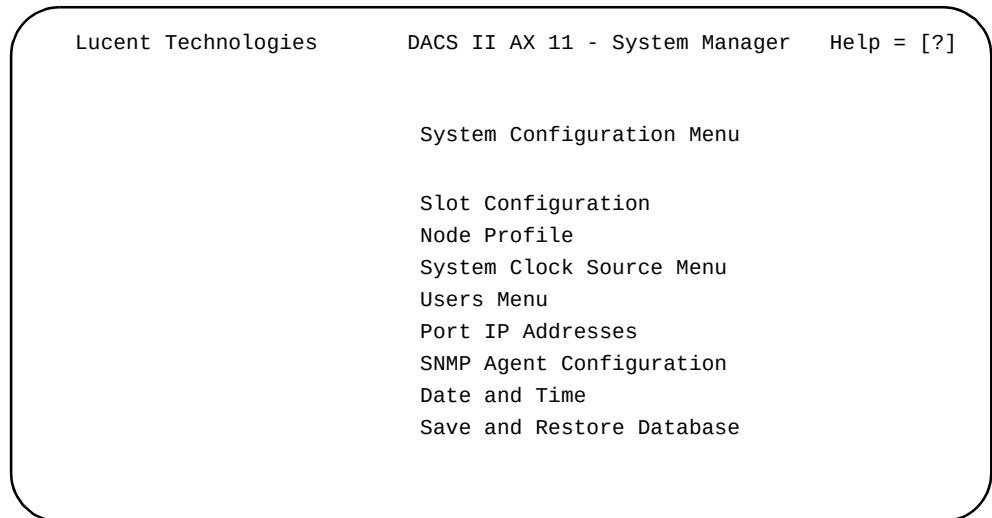


**Figure 22-2. System Configuration Menu**

2. Select *Slot Configuration*. The Slot Configuration Menu (Figure 22-3) displays slots numbered from 1 to 4 (DACS II AX-4) or 1 to 11 (DACS II AX-11):



Lucent Technologies
DACS II AX-11 - System Manager
Help = [?]

Slot Configuration Menu

| Slot#                      | Device Type     | Name        | Redundancy |
|----------------------------|-----------------|-------------|------------|
| ----                       | -----           | -----       | -----      |
| 1                          | Octal T1/E1     | Standby     | Enable     |
| 2                          | Octal T1/E1     |             | Enable     |
| 3                          | Octal T1/E1     |             | Enable     |
| 4                          | Quad High Speed |             | Disable    |
| 5                          | Octal Voice     |             | Disable    |
| 6                          | Octal Voice     |             | Disable    |
| 7                          | Quad T1         | New York    | Disable    |
| 8                          | HT3             |             | Enable     |
| 9                          | STS1            |             | Disable    |
| 10                         | HT3             |             | Enable     |
| 11                         | HT3             | HT3 Standby | Enable     |
| N+1 Redundancy:            |                 | Enable      |            |
| N+1 Redundancy Switchover: |                 | Automatic   |            |
| N+1 Redundancy Restore:    |                 | Manual      |            |

Change Card = [Enter key]
[D]elete Card

**Figure 22-3. Slot Configuration Menu**



**NOTE:**

The N+1 Redundancy fields in the Slot Configuration Menu are not displayed if you are using a DACS II AX-4.

- Move your cursor to the slot number where the Hybrid DS-3 Module will reside, and press **<Enter>**. The Slot Configuration Submenu displays (Figure 22-4).
- Place your cursor on the *Slot name* field and press **<Enter>**. Type in a slot name or number of up to 11 alphanumeric characters and press **<Enter>** again.
- Move your cursor to the *Card type* field and press **<Enter>** until "HT3" is displayed.
- For DACS II AX-11 units with the N+1 Protection Switch, move your cursor to the *Redundancy* field to *Enable* or *Disable* redundancy as desired (not configurable for DACS II AX-4).

**NOTE:**

In order to utilize N+1 redundancy, the Hybrid DS-3 module must be installed in slots 8-10, and the redundant module installed in slot 11.

The screenshot shows a terminal window titled "Lucent Technologies" and "DACS II AX-11 - System Manager" with a "Help = [?]" option. The main menu is "Slot Configuration". Below it, the configuration for "Slot 8" is displayed, showing "Card type: HT3" and "Redundancy: Enable".

```
Lucent Technologies DACS II AX-11 - System Manager Help = [?]

Slot Configuration

Slot name: Slot 8
Card type: HT3
Redundancy: Enable
```

**Figure 22-4. Slot Configuration Submenu**

7. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

**Deleting a Slot Configuration**

To delete a card, first remove the card from the equipment chassis. On the Slot Configuration menu (Figure 22-3), move the cursor to the slot configuration to be deleted and press **D** . A message appears stating, "All existing connections for this slot will be deleted." Press **Y** to confirm the action or **N** to cancel. If you do not remove the card prior to pressing **D**, the following message appears: "-ALERT!- Can not delete a device that is present."

---

## Hybrid DS-3 Main Menu

The Hybrid DS-3 Main Menu is accessed via the Node Summary Menu. From the Main Menu you can configure the module, run diagnostic tests, access utilities, view N+1 Redundancy status (DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware revision levels). The Menu structure is shown in Figure 22-5.

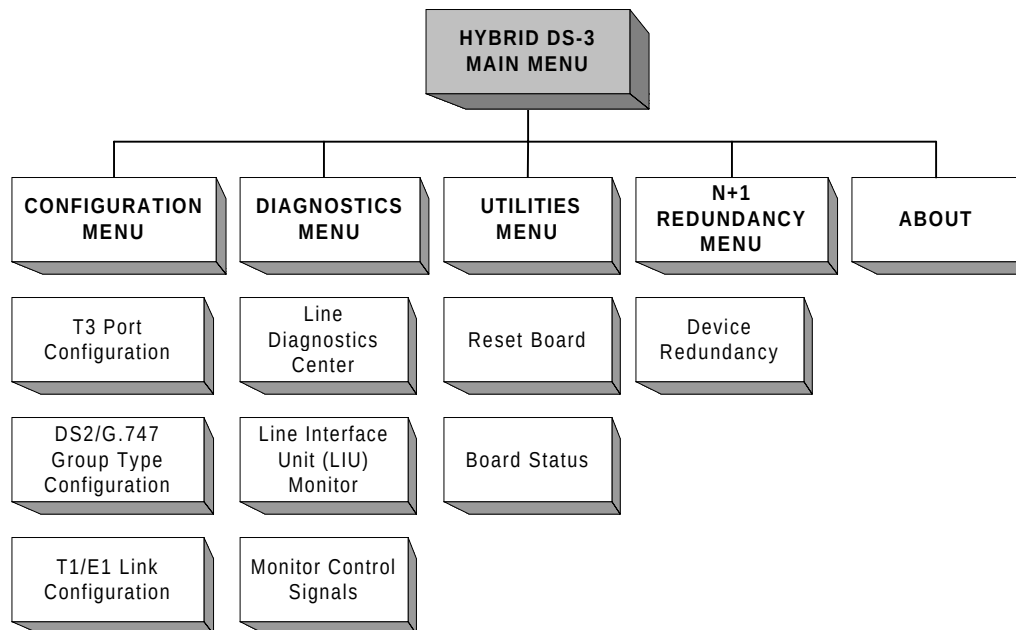
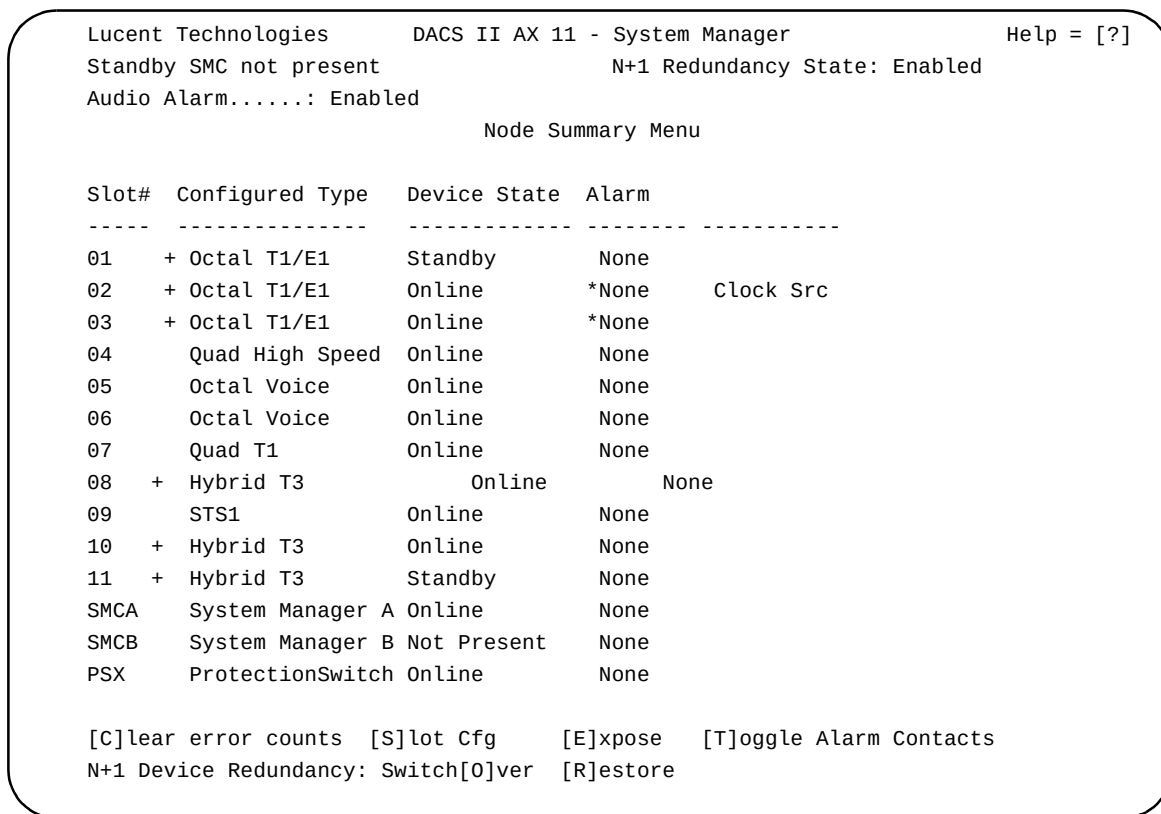


**Figure 22-5. Hybrid DS-3 Menu Structure**

**Access Hybrid  
DS-3 Main Menu**

To access the Hybrid DS-3 Main Menu:

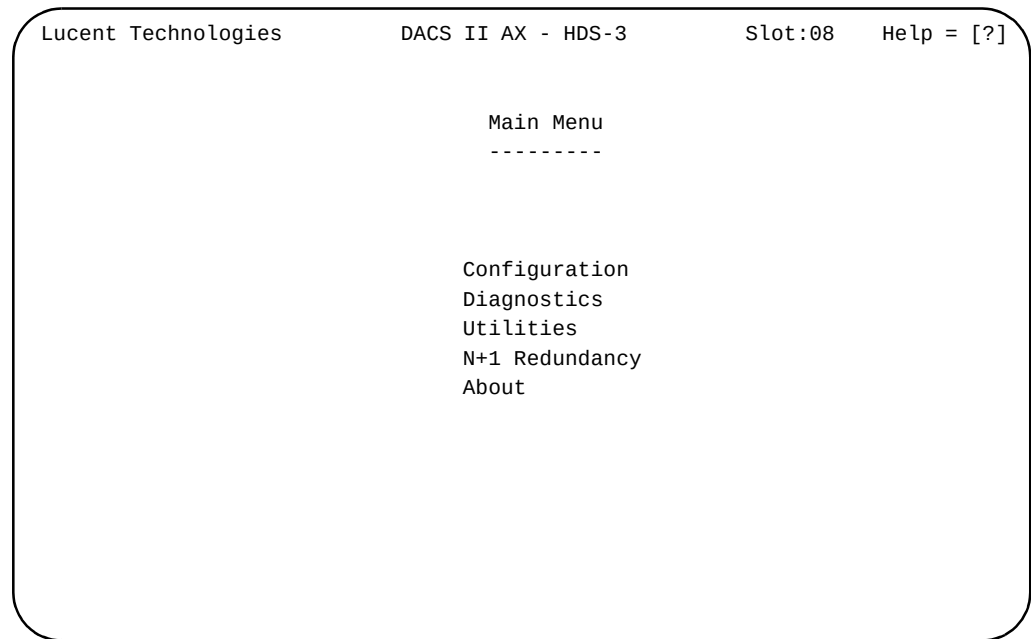
1. From the DACS II AX *Main Menu*, select *Node Summary*. The Node Summary Menu displays (Figure 22-6).

**Figure 22-6. Node Summary Menu**

2. Place your cursor on the slot number where the Hybrid DS-3 Module is located and press **<Enter>**. The Hybrid DS-3 *Main Menu* displays (Figure 22-7).

**NOTE:**

On the Node Summary Menu, the Configured Type must display "Hybrid T3" and the Device State must display "On-line" or "Standby" in order to access the Hybrid DS-3 Module Main Menu. If the Device State is "Off-line", an alert message is generated.



---

**Figure 22-7. Hybrid DS-3 Main Menu**

From the *Main Menu* you can configure the module, run diagnostic tests, access utilities, view N+1 Redundancy status (DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware revision levels).

---

## Configuration Menu

The Configuration Menu provides access to submenus from which the T3 Port, DS2/G.747 Groups, and T1/E1 links can be configured.

**NOTE:**

The Hybrid DS-3 configuration files are stored on the System Manager Card. When a Hybrid DS-3 module is replaced, the old configuration is preserved.

**Configure Module** To configure the Hybrid DS-3 module:

1. From the Hybrid DS-3 *Main Menu*, select *Configuration*. The Configuration Menu displays (Figure 22-8).



**Figure 22-8. Configuration Menu**

The *Configuration Menu* has three options:

- Select *T3 Port Configuration* to configure the T3 port.
  - Select *DS2/G.747 Group Type Configuration* to configure the groups.
  - Select *T1/E1 Link Configuration* to configure the T1 and E1 links.
-



## T3 Port Configuration

The *T3 Port Configuration Menu* is used to enter identification information and set options for the T3 port.

### Configure T3 Port

To configure the T3 port:

1. From the *Configuration Menu*, select *T3 Port Configuration*. The T3 Port Configuration menu displays (Figure 22-9).

```
Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

 T3 Port Configuration

Name.....: Circuit Number
Unit.....: DefU
Facility Id.....: Def - Facility Id
Port Number.....: Def - Port No.
Generator Number.....: Def - Generator No.
Equipment Id.....: Def - EID
Location Id.....: Def - LID
Frame Id.....: Def - FID

M13 Operating Mode.....: Bellcore M13
Rcv Loop Timing.....: Disabled
Short Cable < 50'.....: No
M13 Loopback Request Code.....: 3rd C-Bit Inverted
FEAC Loopback Request: Disabled
Xmit AIS when DS3 in local loop..: None
Transmit DS3 AIS.....: None
Rx DS3 AIS detection selection...: Unframed all ones pattern
```

**Figure 22-9. T3 Port Configuration Submenu**

Refer to the field descriptions on the following pages to assist you in setting up the DS-3 multiplexing parameters.

2. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

## T3 Port Configuration Field Descriptions

---

**Name:** *(text field)* This is a user-defined field. Any name up to 20 alphanumeric characters may be entered as a circuit identifier.



**NOTE:**

The Unit, Facility Id, Port Number, Generator Number, Equipment Id, Location Id, and Frame Id are all optional fields, which can be used by an Administrator to provide information for the DS-3 port.

**Unit:** *(text field)* Enter a device identifier of up to 5 alphanumeric characters.

**Facility Id:** *(text field)* Enter the name of the facility where the equipment is located; up to 37 alphanumeric characters may be entered.

**Port Number:** *(text field)* Enter the number of the port; up to 37 alphanumeric characters may be entered.

**Generator Number:** *(text field)* Enter the generator number; up to 37 alphanumeric characters may be entered.

**Equipment Id:** *(text field)* Enter identification for the equipment in use; up to 9 alphanumeric characters may be entered.

**Location Id:** *(text field)* Enter an identification of where the equipment is located; up to 10 alphanumeric characters may be entered.

**Frame Id:** *(text field)* Enter identification for the frame; up to 9 alphanumeric characters may be entered.

**M13 Operating Mode:** *(option field)* The framing selection for the DS-3 to DS-3 multiplexing. This can be either *C-Bit Parity* or *Bellcore M13*. This setting is provided by the carrier.

**Rcv Loop Timing (Receive Loop Timing):** *(option field)* Controls the DS-3 transmit timing. When *Enabled*, transmit timing is provided by a DS-3 receive clock. When *Disabled*, DS-3 transmit timing is provided by a free running on board oscillator. Refer to Chapter 8, Clocking, for more details on transmit timing.

**Short Cable < 50':** *(option field)* Controls the line build out of the DS-3 transmitter. Set to *Yes* when attached cable is less than 50 feet long.

**M13 Remote Loopback Request Code:** (*option field*) Controls line codes used to set and reset DS-3 remote line loopback requests. This setting is provided by the carrier. These codes cause a DS-3 loopback in remote DS-3 equipment or respond to codes from remote DS-3 equipment. This applies to Bellcore M13 mode only. C-Bit parity has a mechanism defined by specification. Different manufacturers use different patterns in M13 mode.

The option list supports a variety of codes including:

- 3rd C-Bit Inverted
- 2nd C-Bit Inverted
- 1st C-Bit Inverted

**FEAC Loopback Request:** (*option field*) Select *Enabled* to allow the module to **respond** to a Far End Alarm and Control loopback request.

**Xmit AIS when DS3 in local loop:** (*option field*) A DS-3 AIS may be generated in one of four ways. This setting is used to select the DS-3 AIS generation mechanism.

AIS options provided by the carrier include:

- Framed 1010 pattern & C-Bit set to 0
- Framed 1111 pattern & C-Bit set to 0
- Unframed all ones pattern
- None.

**Transmit DS3 AIS:** (*option field*) A DS-3 AIS may be generated in one of four ways. This setting is used to select the DS-3 AIS generation mechanism.

AIS options provided by the carrier include:

- Framed 1010 pattern & C-Bit set to 0
- Framed 1111 pattern & C-Bit set to 0
- Unframed all ones pattern
- None.

**Rx DS3 AIS detection selection:** (*option field*) A DS-3 AIS may be detected in one of five ways. This setting is used to select the DS-3 AIS mechanism that is used for providing an R3AIS alarm.

Alarm options provided by the carrier include:

- Unframed all ones pattern
  - Framed 1010, overhead bits disregarded
  - C-bits=0, payload bits disregarded
  - Framed 1010, C-Bits=0
  - Framed 1111, overhead bits disregarded.
-

## **DS2/G.747 Group Type Configuration**

Up to 28 links can be assigned into 7 groups of either 4 DS-1 or 3 E1 links per group. A group will always consist of links of the same type. When configured for E1, the fourth link within a group is not available.

### **Configure DS2/ G.747 Groups**

To configure the DS2/G.747 groups:

1. From the *Configuration Menu*, select *Mapper Configuration*. The DS2/G.747 Group Type Configuration menu displays (Figure 22-10).

| Group# | Type |
|--------|------|
| 1:     | DS1  |
| 2:     | E1   |
| 3:     | DS1  |
| 4:     | DS1  |
| 5:     | DS1  |
| 6:     | DS1  |
| 7:     | DS1  |

**Figure 22-10. DS2/G.747 Group Type Configuration Submenu**

2. For each group number, the type can be defined by moving your cursor to the applicable group number and pressing **<Enter>** to select either *DS1* or *E1*. The *About HT3 Module* display is a read-only screen.

**NOTE:**

A group will always consist of 4 links, even if the fourth has been disabled (E1). For example, Group #1 consists of links 1-4, Group #2 consists of links 5-8, etc.

3. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

---

**DS2/G.747 Group  
Type  
Configuration  
Field Descriptions**

**Group#:** This field displays the DS-2 Group Number (1-7) of the group that you are configuring.

**Type:** This field is used to select either *DS1* or E1 as the type of links contained within the group.

---

## T1/E1 Link Configuration

### Configure T1/E1 Links

To configure the T1 or E1 link:

1. From the *Configuration Menu*, select *T1/E1 Link Configuration*. The T1/E1 Link Configuration menu displays (Figure 22-11).

|                          |           |                    |         |       |                    |       |      |
|--------------------------|-----------|--------------------|---------|-------|--------------------|-------|------|
| Lucent Technologies      |           | DACS II AX - HDS-3 |         |       | Slot:08 Help = [?] |       |      |
| T1/E1 Link Configuration |           |                    |         |       |                    |       |      |
| -----                    |           |                    |         |       |                    |       |      |
|                          |           | Clear              |         |       | Network            | Yel   | Idle |
| Nbr                      | Link Name | T1/E1              | Framing | FDL   | Loop               | Alarm | Code |
| -----                    |           |                    |         |       |                    |       |      |
| 01                       | Link 01   | Disabled           | T1 ESF  | 54016 | Disable            | No    | Idle |
| 02                       | Link 02   | Disabled           | T1 ESF  | 54016 | Disable            | No    | Idle |
| 03                       | Link 03   | Disabled           | T1 ESF  | 54016 | Disable            | No    | Idle |
| 04                       | Link 04   | Disabled           | T1 ESF  | 54016 | Disable            | No    | Busy |
| 05                       | Link 05   | Framed             | E1      |       | Disable            | No    | Busy |
| 06                       | Link 06   | Framed             | E1      |       | Disable            | No    | Busy |
| 07                       | Link 07   | Framed             | E1      |       | Disable            | No    | Busy |
| 08                       | Link 08   | Link Not Available |         |       |                    |       |      |
| 09                       | Link 09   | Out Of Service     |         |       |                    |       |      |
| 10                       | Link 10   | Out Of Service     |         |       |                    |       |      |
| 11                       | Link 11   | Out Of Service     |         |       |                    |       |      |
| 12                       | Link 12   | Out Of Service     |         |       |                    |       |      |
| 13                       | Link 13   | Out Of Service     |         |       |                    |       |      |
| 14                       | Link 14   | Out Of Service     |         |       |                    |       |      |
|                          |           |                    |         |       |                    |       |      |
| [N]ext page              |           | [C]opy cfg to all  |         |       |                    |       |      |

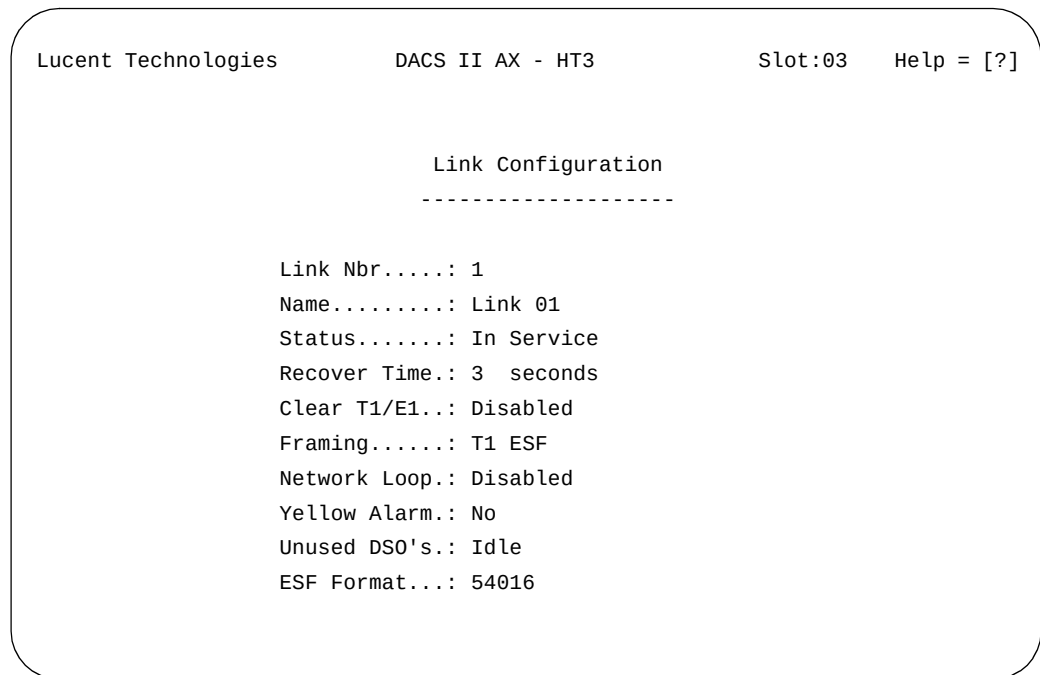
**Figure 22-11. T1/E1 Link Configuration Submenu**



**NOTE:**

For the 4th (unused) link within an E1 group, "Link Not Available" appears on the screen, and no configuration is possible.

2. To change parameters for an individual link, move the cursor to the link to be changed and press **<Enter>**. The Link Configuration menu displays (Figure 22-12).



---

**Figure 22-12. Link Configuration Submenu**

3. The above submenu appears when you select a link to configure. The fields shown on this submenu are described on the following pages.
  4. Once the link is configured, press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.
-



## **Link Configuration Field Descriptions**

**Link Nbr (Link Number):** This field displays the Link Number (1-28) of the link that you are configuring.

**Name:** (*text field*) This is a user-defined field. Any name up to 20 alphanumeric characters can be entered to identify each link on the Hybrid DS-3 Module. You may find it beneficial to use DS2/G.747 Group numbers to name the links.

**Status:** (*option field*) This field is used to select the state of the link. You can put the link(s) *In Service* or *Out of Service*.

**Recover Time:** (*option field*) This field is used to specify how quickly Red/Yellow alarms are cleared following the recovery of the given T1 facility (e.g., valid signal and framing present). Select either 3, 10, or 15 seconds.

**Clear T1/E1:** (*option field*) "Clear" refers to a condition where the module passes data through without reformatting it in any way (essentially, the module acts the same as a wire). The following selections are available:

- **Framed** - Allows alarms and statistics to be displayed.
- **Unframed** - Passes data without keeping track of alarms and statistics. Limited diagnostics functions are available.
- **Disabled** - Turns off Clear mode (uses standard framing pattern and detects all alarms/errors). All diagnostic functions are available.



**NOTE:**

When using Clear T1 (E1) mode, make the connection ensuring that 25 (32) DS0s have connections mapped (see Chapter 5 for details on connection mapping). This is necessary because of the way Clear T1/E1 mode operates, taking the framing bits from the first 24 (31) DS0s and sending them all out through the 25th (32nd) DS0.

**Framing:** (*option field*) This field enables you to select the line type for the link when in Clear T1/E1 Disabled or Framed mode. The available selections are: *T1 ESF*, *T1 D4*, *E1*, *E1-CRC*, *E1-CAS*, and *E1-CAS-CRC*. CRC = Cyclic Redundancy Check, and CAS = Channel Associated Signaling.



**NOTE:**

When using E1-CAS or E1-CAS-CRC framing, make the connection ensuring that DS0 17 is reserved for signalling purposes (See Chapter 5 for details on connection mapping).

When Clear T1/E1 is set to *Unframed*, the available framing types will only be *T1 Unfrm* or *E1 Unfrm*.

**Network Loop:** (*option field*) This parameter determines the Hybrid DS-3 Module's ability to respond to diagnostic commands received from the network supplier. *Enabled* indicates that the Hybrid DS-3 Module will respond to loop commands received from the network supplier, and *Disabled* indicates that it will not respond. Selectable only in Clear T1/E1 Disabled mode.

**Yellow alarm:** (*option field*) *Yes* causes the T1 circuit to discard data and send a yellow alarm if it is in a red alarm condition for three seconds. *Yes* must be chosen if the network supplier is a common carrier, such as a telephone company. Selectable only in Clear T1/E1 Disabled mode.

**Unused DS0's:** (*option field*) This entry is used to select the state of unused DS0s as either *Busy* (All Ones) or *Idle* (0). Selectable only in Clear T1/E1 Disabled mode.

**ESF Format:** (*option field*) This entry describes the types of ESF network commands to which the Hybrid DS-3 Module responds. It has no meaning for D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between *54016* (AT&T Technical Reference 54016) and *T1.403* (ANSI specification T1.403). Selectable only in Clear T1/E1 Disabled mode.

---

## Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks and built-in BERT.

There are multiple loopback options. Each of the links can be independently looped back. The DS-3 line can also be looped back. Loopbacks can occur towards the line or towards the backplane. A depiction of various loop types is provided in Figure 22-22.

The built-in BERT generator and testers can be used along with loopbacks to test and determine the status of the Hybrid DS-3 Module. They may also be used in conjunction with diagnostic facilities on other DACS II AX cards to qualify operation of the backplane connections. Statistics displays are also provided for monitoring and diagnostic purposes.

### Perform Diagnostics on Hybrid DS-3 Module

To view statistics and perform diagnostics on the Hybrid DS-3 module:

1. From the *Main Menu*, select *Diagnostics*. The Diagnostics Menu displays (Figure 22-13).

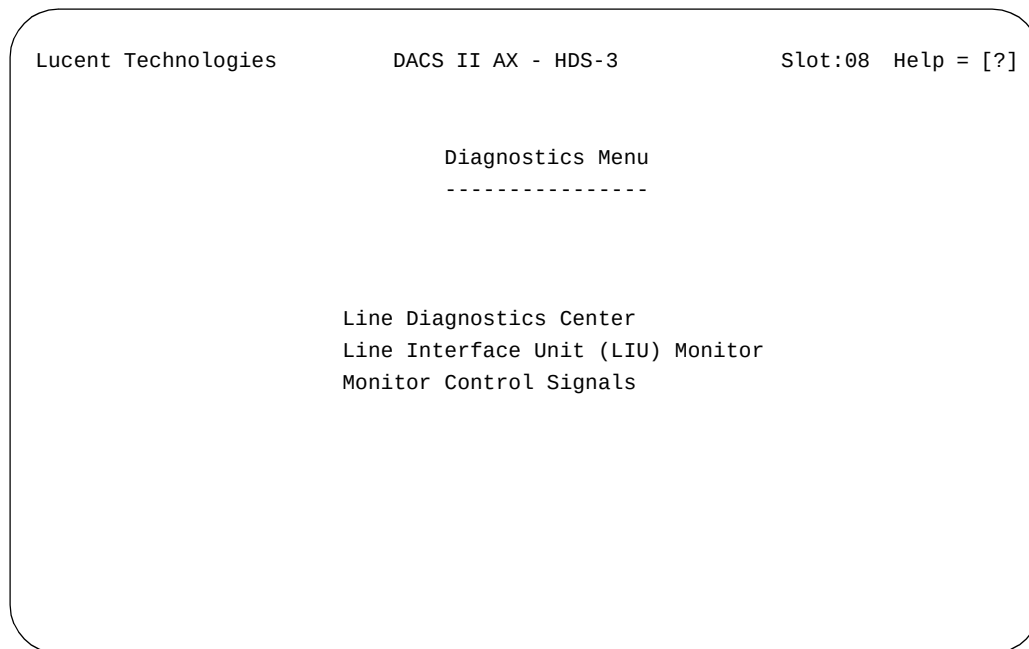


**Figure 22-13. Diagnostics Menu**

The *Diagnostics Menu* has three options:

- Select *Line Diagnostics Center* to open the *Diagnostics Manager* submenu. From this submenu, line diagnostic options such as loopbacks and built-in BERT can be employed.
  - Select *Line Interface Unit (LIU) Monitor* to open the T3 Line Interface Unit Monitor display. This display is a read-only screen that allows viewing the status of loopbacks and errors.
  - Select *Monitor Control Signals* to open the *PCM Signalling Display Menu*. This menu displays the control signals for the selected link.
-

## Diagnostics Manager

The Diagnostics Manager is used to set up line diagnostics for the Hybrid DS-3 Module.

### Perform Line Diagnostics

To perform line diagnostics:

1. From the *Diagnostics Menu*, select *Line Diagnostics Center*. The Diagnostics Manager menu displays (Figure 22-14).

```

Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

 Diagnostics Manager

Link Name DS1/E1 Link Back Bert Testing
State ErrSecs Loop Loop State Duration ErrSecs
-----+-----+-----+-----+-----+-----+-----+-----
Link 01 OK 1 Off Off Off 0 0
Link 02 OK 1 Off Off Off 0 0
Link 03 OK 1 Off Off Off 0 0
Link 04 OK 1 Off Off Off 0 0
Link 05 OK 1 Off Off Off 0 0
Link 06 OK 1 Off Off Off 0 0
Link 07 OK 1 Off Off Off 0 0
-----+-----+-----+-----+-----+-----+-----+-----
T3 Framer OK 0 Off NA Off 0 0
-----+-----+-----+-----+-----+-----+-----+-----

[B]ert [L]oop
[E]xpose [S]tatistics (ESF) [R]egisters (ESF)
[C]lear counters [N]ext [I]n service (toggle view)

```

Figure 22-14. Diagnostics Manager Submenu

From the *Diagnostics Manager* submenu (Figure 22-14), a submenu may be viewed or invoked to perform additional diagnostic actions such as loopbacks, BERT, and viewing additional statistics. To view an additional 7 links (up to 28 total), press **N**. To clear counters for the DS-3 framer and all 28 links (including those not shown on the current screen), press **C**.

---

### Available Diagnostic Tests

The following are diagnostic tests and status displays that can be enabled on the module, T1/E1 links and DS-3 link from the *Diagnostics Manager* (Figure 22-14). These tests can be run by placing your cursor on a numbered link or on the *T3 Framer* field and pressing a *hot key* (see bullets below):

- **[B] = Bert:** Allows you to select several pseudo-random test patterns for testing both the T1/E1 links and the DS-3 link. Selectable only in Clear T1/E1 Disabled mode.
- **[E] = Expose:** Allows you to display the status of the link and run additional procedures such as re-initializing the T1/E1 framers and injecting known errors. Selectable in all modes.
- **[C] = Clear Counters:** Allows you to clear all errored second and BERT counters. Selectable in all modes.
- **[L] = Loop:** Allows you to enable several different loopbacks for both the T1/E1 links and the DS-3 link. Selectable in all modes.
- **[S] = Statistics (ESF):** Allows you to view the *ESF Statistics Display*, which shows current and 24-hour statistics for the specific ESF link. Framing statistics are only available in Clear T1/E1 Disabled mode.
- **[R] = Registers (ESF):** Allows you to view the *ESF Registers Display*, which gives the same information as the *ESF Statistics Display* but it is broken down by port for each of the ninety-six 15-minute intervals in the preceding 24-hour period. Framing statistics are only available in Clear T1/E1 Disabled mode.
- **[N] = Next:** Allows you to view an additional 7 links (up to 28 total).
- **[I] = In Service:** Allows you to view only those links that are currently in service.

The procedures for running diagnostics and viewing statistics are detailed on the next several pages.

---

## Line Diagnostics Manager Submenu Field Descriptions

---

These fields appear on the Diagnostics Manager menu (Figure 22-14).

**Link Name:** This field displays the link name entered from the *Configuration Menu*.

**DS1/E1 State:** This field displays the status of the DS1 or E1 link as one of the following:

- OK - In Service and functioning properly
- LOS - Loss of Signal
- AIS - Alarm Indication Signal
- LOF - Loss of Frame
- YEL - Yellow Alarm
- CFA - Change of Frame Alignment
- SEF - Severely Errored Frame
- TSLP - Transmit Slip
- RSLP - Receive Slip
- SLIP - Both Transmit Slip and Receive Slip
- RED - Red Alarm
- OOS - Out of Service
- ERR - More than one of the above errors is present

For explanations of the above conditions, refer to T1/E1 Link Status Field Descriptions, in the "Expose" section.

**DS1/E1 ErrSecs (Errored Seconds):** This field displays the number of errored seconds that have occurred on the T1 or E1 link since the last time that the counter was reset. The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second.

**Link Loop:** This field displays the type of diagnostic loop that has been enabled. *T3-Local* or *LIU-Loop* will be indicated, or *Off* is displayed if no loop has been enabled. A depiction of various loop types is provided in Figure 22-22.

**Back Loop (Backplane Loop):** *On* displayed in this field indicates that a backplane loop is enabled. A depiction of various loop types is provided in Figure 22-22.

**Bert Fields**

**Bert Testing State:** Displays the type of BERT that is currently running. If BERT is not enabled, then *Off* is indicated. Refer to the section on BERT for a list of the possible displayed states.

**Bert Testing Duration:** This field displays the amount of time (in seconds) that BERT has been enabled.

**Bert Testing ErrSecs:** This field displays the number of errored seconds that have occurred since BERT was enabled.

---

**T3 Fields**

**T3 Framer:** This field displays the status of the T3 port as one of the following:

- OK - In Service and functioning properly
  - OOF - Out of Frame
  - LOS - Loss of Signal
  - PAIS - Path Alarm Indication Signal
  - OOS - Out of Service
  - ERR - More than one of the above errors is present.
-



## BERT (Bit Error Rate Test)

BERT is used to test the bit error rate of the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine transmission line quality. If a pattern match cannot be found, Errored Seconds counts are incremented to record the time during which a pattern lock in the receive path could not be established. For troubleshooting purposes, combining BERT with diagnostic loops is very useful in isolating problems within a circuit. BERT is available for both the links (when in Clear T1/E1 Disabled mode) and for the LIU.

### Perform BERT on a Link

To perform BERT for a link:

1. Place your cursor on an active T1/E1 link in the *Diagnostics Manager* submenu and press **B**. The Bit Error Test (BERT) Selection menu displays (Figure 22-15).

```

Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

 Bit Error Test (BERT) Selection

 Link Number...: 1
 Link Name....: (1,1)
 Current BERT.: Off
 New BERT.....: Off

----- DS1/T1 ----- DS1/T1 -----
[2] Unfrm 2047 [B] Frm 2047
[3] Unfrm 2^15 [C] Frm 2^15
[4] Unfrm 2^20 [D] Frm 2^20
[5] Unfrm 2^23 [E] Frm 2^23
[6] Unfrm 2^11-7 0's limits [F] Frm 2^11-7 0's limits
[7] Unfrm 2^15-7 0's limits [G] Frm 2^15-7 0's limits
[8] Unfrm QRSS [H] Frm QRSS
[9] Unfrm 2^23-14 0's limits [I] Frm 2^23-14 0's limits

[0]ff
[A]ll 2047 (All T1/E1 links generate 2047 Bert Pattern)
[S] TSMF 2047 (TSMF -> Link and TSMF -> Backplane)

```

**Figure 22-15. BERT Selection Submenu**

The *BERT Selection* submenu has a list of several test patterns that you can choose.

**NOTE:**

The link must be in service and Clear T1/E1 must be disabled in order to perform BERT.

2. To select a BERT pattern, either place the cursor on the *New BERT* field and press **<Enter>** to cycle through the choices OR press the specific *hot key* indicated on the bottom of the menu. The selectable patterns and their corresponding *hot keys* are as follows:

**DS1/T1 BERT:**

- **[2]** Unframed 2047
- **[3]** Unframed 2<sup>15</sup>
- **[4]** Unframed 2<sup>20</sup>
- **[5]** Unframed 2<sup>23</sup>
- **[6]** Unframed 2<sup>11</sup> - 7 0's limits
- **[7]** Unframed 2<sup>15</sup> - 7 0's limits
- **[8]** Unframed QRSS
- **[9]** Unframed 2<sup>23</sup> - 14 0's limits
- **[B]** Framed 2047
- **[C]** Framed 2<sup>15</sup>
- **[D]** Framed 2<sup>20</sup>
- **[E]** Framed 2<sup>23</sup>
- **[F]** Framed 2<sup>11</sup> - 7 0's limits
- **[G]** Framed 2<sup>15</sup> - 7 0's limits
- **[H]** Framed QRSS
- **[I]** Framed 2<sup>23</sup> - 14 0's limits

**Other Selections:**

- **[O]** Off
- **[A]** All 2047 (All T1/E1 links generate 2047 Bert Pattern)
- **[S]** TSFM 2047 (TSFM -> Link and TSFM -> Backplane)

3. Press **X** to start the test. The Start New Test message displays (Figure 22-16).

```

Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

 Bit Error Test (BERT) Selection

 Link Number...: 1
 Li
 Cu *****
 Ne *
 *
 * -MESSAGE!- *
 *
 *
 ---- DS1/T1 ----- *
 [2] Unfrm 2047 * Start New Test? *
 [3] Unfrm 2^15 *
 [4] Unfrm 2^20 *
 [5] Unfrm 2^23 * Are you sure (Y/N)? *
 [6] Unfrm 2^11-7 0's *
 [7] Unfrm 2^15-7 0's *****
 [8] Unfrm QRSS
 [9] Unfrm 2^23-14 0's limits [I] Frm 2^23-14 0's limits

 [0]ff
 [A]ll 2047 (All T1/E1 links generate 2047 Bert Pattern)
 [S] TSFM 2047 (TSFM -> Link and TSFM -> Backplane)

```

**Figure 22-16. Start New Test Screen**

4. Press **Y** to initiate the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *BERT Selection* submenu.
5. From the *BERT Selection* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.

**Stop BERT on a Link**

To stop the link BERT test:

1. From the *Diagnostics Manager* submenu, press **B** and the *BERT Select Menu* appears.
2. With the cursor on the *New BERT* field, press the letter **O**.
3. Press **X** to stop the test.
4. When prompted: "Stop Bit Error Test? Are you sure (Y/N)?" Press **Y** to stop the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *BERT Selection* submenu.
5. From the *BERT Selection* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.

**Perform BERT for LIU**

To perform BERT for the LIU:

1. From the *Diagnostics Manager* submenu, place your cursor on the *T3 Framer* field and press **B**. The Liu Bert submenu displays (Figure 22-17).

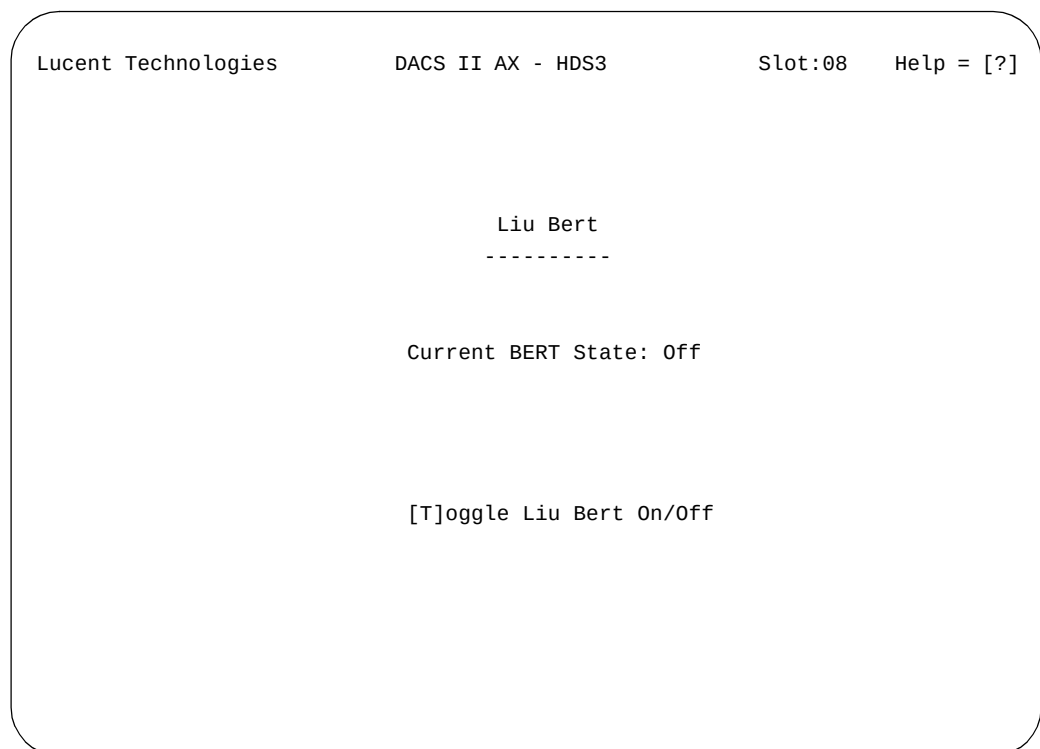


**Figure 22-17. LIU Bert Submenu**

2. Press **T** to toggle LIU BERT *On*.
3. Press **X** to start the test.
4. When prompted: "Start New Test? Are you sure (Y/N)?" Press **Y** to initiate the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *LIU Bert* submenu.
5. From the *LIU BERT* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.

**NOTE:**

The LIU BERT pattern is 2^15.

---

**Stop BERT on LIU**

To stop The LIU BERT test:

1. From the *Diagnostics Manager* submenu, place your cursor on the *T3 Framer* field and press **B**. The *LIU Bert* submenu appears.
  2. Press **T** to toggle LIU BERT *Off*.
  3. Press **X** to stop the test.
  4. When prompted: "Stop Bit Error Test? Are you sure (Y/N)?" Press **Y** to stop the test and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *LIU Bert* submenu.
  5. From the *LIU Bert* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.
-

## Display Link or Framer Status (Expose)

The *Expose* function is used to display the status of the T1/E1 links and the T3 Framer, access G.826 statistics, reinitialize the framer, and insert errors for diagnostic purposes.

### View Status of T1/E1 Links

To view (expose) the status of the T1/E1 links:

1. Place your cursor on an active T1/E1 link in the *Diagnostics Manager* submenu and press **E**. The T1/E1 Link Status menu displays (Figure 22-18).

```

Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

 T1/E1 Link Status
Link Name : Link 01 ----- Link Number: 1

 DS1/E1 Status
 Error State ErrSecs
 -----+-----

Red Alm: Off 0
Yel Alm: Off 0
LOS : Off 0
AIS Ind: Off 0
OOF : Off 0
SEF Ind: Off 1
Tx Slip: Off 1
Rx Slip: Off 1

 Crc Errors.....:1023
 Bpv Errors.....:0
 Frm Bit Errors....:4095
 Trunk Conditioning:Off

 Remote Bert ErrSecs:0
 Local Bert ErrSecs.:0
 Local Bert ErrSecs.:0

C]lear Counters ESF [S]tatistics ESF [R]egisters [G].826 Re[i]nitialize
----- Hit key 1 thru 9 to insert an error -----
[1]CAS Multiframe [2]Multiframe [3]PRBS [4]FBit
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All

```

**Figure 22-18. T1/E1 Link Status Submenu**

Some of the fields are context sensitive, (e.g., the CRC errors only appear for links that support CRC such as T1 ESF). An error-free link will display zeroes in all fields.

**NOTE:**

An LIU BERT data pattern can contain a significant number of errors and still be valid (inserted errors may not be seen).

From the *T1/E1 Link Status* submenu, you can press **C** to clear counters for the selected link, **S** to view ESF Statistics, **R** to view ESF Registers, **G** to view G.826 Statistics, or **I** to reinitialize the T1/E1 framer.

**WARNING:**

*Re-initializing the framer will cause data to be momentarily corrupted.*

You can also use keys **1** through **9** to insert errors from the NI side, which is then shown on the remote side. If the remote side is line looped, the inserted errors will be seen on the local side, under Errored Seconds.

---

**T1/E1 Link Status  
Field Descriptions**

**Link Name:** This field displays the link name entered from the *Configuration Menu*.

**DS1/E1 Status Fields**

**Error:** This field displays the type of error on the specific T1/E1 link.

**State:** A display of *On* next to any of the *Error* entries indicates that an error condition currently exists on the T1/E1 link. A display of *Off* indicates that the error condition is not present, but if the errored seconds field has a count, then this alarm has occurred sometime in the past (since the last time that the counter was cleared).

**NOTE:**

All Error and Alarm states will only be detected in Clear T1/E1 Disabled mode, except for LOS and BPV. These will also be detected in Clear T1/E1 Framed mode.

**ErrSecs (Errored Seconds):** This field displays the quantity of seconds that an error condition on the T1/E1 link has been present or was present. Press **C** to clear the counters for this link.

**Red Alm (Red Alarm):** *On* indicates that a loss of frame alignment has occurred and synchronization has been lost.

**Yel Alm (Yellow Alarm):** A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not correctly receiving the DACS II AX signal (the network is not in sync or a red alarm has occurred).

**LOS (Loss of Signal):** *On* indicates a loss of signal detection. No T1 or E1 signal is present on the RX pair to the DACS II AX.

**AIS Ind (Alarm Indication Signal Indication):** *On* indicates that an unframed "all ones" condition has been detected.

**OOF (Out of Frame):** *On* indicates that the receive data stream does not meet pre-set framing criteria.

**SEF Ind (Severely Errored Frame Indication):** *On* indicates a Severely Errored Frame has been detected (the receive signal does not meet the requirements of ANSI T1.231).

**Tx Slip (Transmit Slip):** *On* indicates that slip has been detected in the transmit path.

**Rx Slip (Receive Slip):** *On* indicates that slip has been detected in the receive path.

**Crc Errors (Cyclic Redundancy Check Errors):** In ESF framing, one or more CRC6 block errors have been detected. The test is a 6-bit algorithm that checks the content of the entire superframe. The D4 framing does not include CRC6; DACS II AX replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance.

**BPV Errors (Bi-Polar Violation Errors):** *On* indicates that Bipolar Violations have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.

**Frm Bit Errors (Framing Bit Errors):** *On* indicates that One or more frame alignment bit errors have been detected. This does not mean that synchronization has been lost.

**Trunk Conditioning:** If trunk conditioning status is *On* and the control bits indicate a red or yellow alarm is being received, the following occurs:

- Receive data is disabled at all DS0s.
- Idle code is written to corresponding slip buffer according to content of each timeslot (data/voice).



If trunk conditioning status is *Off*, then no alarms are being received.

**Remote Bert ErrSecs:** Displays the number of errored seconds resulting from BERT patterns not being returned from the direction of the backplane.

**Local Bert ErrSecs:** Displays the number of errored seconds resulting from BERT patterns not being returned from the direction of the link.

### View HDS-3 Framer Status

To view (expose) the status of the HDS-3 framer:

From the *Diagnostics Manager* submenu, place your cursor on the *T3 Framer* field and press **E**. The HDS-3 Framer Status Display appears (Figure 22-19).

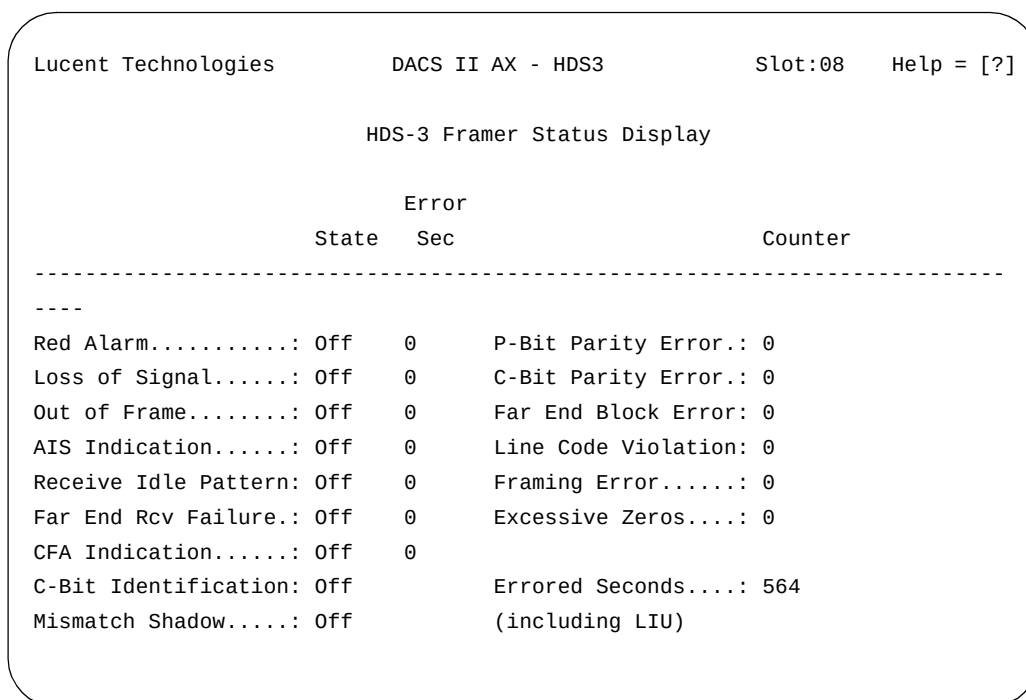


**Figure 22-19. HDS-3 Framer Status Display**

From the *HDS-3 Framer Status* display, the only action that is available is pressing **C** to clear the counters for the T3 Framer.

## HDS-3 Framer Status Display Field Descriptions

---

**Red Alarm:** A display of *On* indicates that a loss of frame alignment has occurred and synchronization has been lost.

**Loss Of Signal:** A display of *On* indicates a loss of signal detection. No DS-3 signal is present on the RX pair to the DACS II AX.

**Out Of Frame:** A display of *On* indicates that the received DS-3 data stream does not meet pre-set framing criteria.

**AIS Indication (Alarm Indication Signal Indication):** A display of *On* indicates that an unframed "all ones" condition has been detected.

**Receive Idle Pattern:** A display of *On* indicates that an idle pattern is being received.

**Far End Rcv Failure:** A display of *On* indicates that a receive failure has been reported by a remote unit.

**CFA Indication (Change of Frame Alignment Indication):** A display of *On* indicates that a change of Frame Alignment has taken place.

**C-Bit Identification:** A display of *On* indicates that a change of C-bit identification indication has occurred internal to the DS-3 framer.

**Mismatch Shadow:** A display of *On* indicates that one of the framers is bad (hardware failure).

**P-Bit Parity Error:** A display of *On* indicates that incorrect parity bits are being received.

**C-Bit Parity Error:** A display of *On* indicates that a C-Bit parity error has been detected in DS-3 to DS-3 multiplexing.

**Far End Block Error:** A display of *On* indicates that Far End Block Errors that have occurred. A Far End Block Error indicates a remote device that has errors.

**Line Code Violation:** A display of *On* indicates a Line Code violation.

**Framing Error:** A display of *On* indicates that the receive data stream does not meet pre-set framing criteria.

**Excessive Zeros:** A display of *On* indicates that excess zeros have been detected in the data stream.

Errored Seconds (including LIU): Displays the number of errored seconds that have occurred since the last time the counters were reset.

---

## G.826 Statistics

To access the G.826 Statistics screen:

This status screen displays performance statistics for the selected T1/E1 link for the duration of time that the link is up and running.

From the *T1/E1 Link Status* submenu, press **G**. The G.826 Statistics menu displays (Figure 22-20).

```
Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

 G.826 Statistics

Link#: 1
Total Time.....: 3325
Errored Seconds.....: 0
Error Free Seconds.....: 3325
Severely Errored Seconds.....: 0
Consecutive Severely Errored Seconds: 0
Consecutive Error Free Seconds.....: 3325
Background Errored Seconds.....: 0
Errored Seconds Ratio.....: 0.0000
Severely Errored Seconds Ratio.....: 0.0000
Background Errored Seconds Ratio....: 0.0000

[C]lear Counters
```

**Figure 22-20. G.826 Statistics Display**

The *G.826 Statistics* display is a read-only screen. The only action that can be accomplished here is pressing **C** to clear the counters. Descriptions for each field on this screen are supplied on the following pages.

## **G.826 Statistics Field Descriptions**

---

Refer to the ITU-T Standardized Specifications, dated 08/96, for a more detailed description of the G.826 statistics.

**Link #:** Displays the number of the link for which the status is being presented.

**Total Time:** Displays the amount of time (in seconds) that the link has been up and running.

**Errored Seconds:** A one-second period with one or more errored blocks or at least one defect is known as an errored second. This field displays the number of errored seconds that have occurred since the last counter reset.

**Error Free Seconds:** A one-second period of time during which the link was error free. This field represents the number of errored free seconds that have occurred.

**Severely Errored Seconds:** A subset of errored seconds, a one-second period in which more than 30% of the blocks contain errors is known as a severely errored second. This field displays the number of severely errored seconds that have occurred since the last counter reset.

**Consecutive Severely Errored Seconds:** A continuous occurrence of severely errored seconds, in one-second intervals, which contain >30% or more errored blocks. This field represents the number of consecutive severely errored seconds that have occurred since the last counter reset.

**Consecutive Error Free Seconds:** A display of consecutive one-second period intervals that did not have defects or errors on the link. This field displays the number of consecutive errored free seconds that have occurred since the last counter reset.

**Background Errored Seconds:** A one second period with one or more errored blocks or at least one defect not occurring as part of the errored seconds. This field displays the number of background errored seconds that have occurred since the last counter reset.

**Errored Seconds Ratio:** Displays the ratio of errored seconds to total seconds in available time during a fixed measurement interval.

**Severely Errored Seconds Ratio:** Displays the ratio of severely errored seconds to total seconds in available time during a fixed measurement interval.

**Background Errored Seconds Ratio:** Displays the ratio of background block errors to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during severely errored seconds.

---

## Re-initialize Framer

The Re-initialize function is used to reset the T1/E1 framer to its default values. It will only reset the framer, not the entire module.



### WARNING:

*Re-initializing the framer will cause data to be momentarily corrupted for all 8 links residing in that framer.*

To re-initialize the framer:

From the *T1/E1 Link Status* submenu, press **I** to re-initialize the framer. The following message appears:

```

Lucent Technologies DACS II AX - HDS-3 Slot:08 Help = [?]

 T1/E1 Link Status
Link Name.: Link 01 ----- Link Number: 1

 DS1/E1 Status
Error State ErrSe *****
----- *
Red Alm: On 199 * -MESSAGE!- *: 0
Yel Alm: Off 0 * * *: 0
LOS....: On 201 * * * ors.....: 2
AIS Ind: Off 0 * Reset and re-configure the framer? * tioning.: On
OOF....: On 201 * * *
SEF Ind: On 201 * * * ErrSecs: 0
Tx Slip: Off 1 * Are you sure (Y/N)? * ErrSecs.: 0
Rx Slip: On 201 * * *

[C]lear Counters ESF [S]tatistics ESF [R]egisters [G].826 Re[i]nitalize
----- Hit key 1 thru 9 to insert an error -----
[1]CAS Multiframe [2]Multiframe [3]PRBS [4]FBit
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All

```

**Figure 22-21. Reinitialize Framer Screen**

2. Press **Y**. The T1/E1 framer will be re-initialized, and you are returned to the *T1/E1 Link Status* submenu. Press **N**, and you are returned directly to the *T1/E1 Link Status* submenu without the framer being re-initialized.
-



---

## Inserting Errors

---

For diagnostic purposes, specific errors can be inserted and momentarily transmitted either directly to a remote unit or looped back to the Hybrid DS-3 module.

---

### T1/E1 Link

To insert errors for a T1/E1 link:

1. From the *T1/E1 Link Status* submenu, press the specific numeric key indicated on the bottom of the menu to choose the type of error. A confirmation screen will appear next, asking if you want to insert the specific error (Y/N). The errors and their corresponding *hot keys* are as follows:
    - **[1]** CAS Multiframe
    - **[2]** Multiframe
    - **[3]** PRBS
    - **[4]** FBit
    - **[5]** Frame Alignment
    - **[6]** Line Code Violation
    - **[7]** Bit Slip
    - **[8]** CRC
    - **[9]** All
  2. Once you have inserted the error(s), you are returned to the *T1/E1 Link Status* submenu where you can view error status.
- 

### HDS-3 Framer

To insert errors for the HDS-3 framer:

1. From the *HDS-3 Framer Status* submenu, press the specific numeric key indicated on the bottom of the menu to choose the type of error. A confirmation screen will appear next, asking if you want to insert the specific error (Y/N). The errors and their corresponding *hot keys* are as follows:
  - **[1]** FEBE
  - **[2]** P-Bit Parity
  - **[3]** C-Bit Parity
  - **[4]** Multiframe Alignment

- **[5]** Frame Alignment
  - **[6]** Line Code Violation
  - **[7]** Loss of Signal
  - **[8]** All
2. Once you have inserted the error(s), you are returned to the *HDS-3 Framer Status* submenu where you can view error status.
-

## Diagnostic Loops

Link Loops available for the Hybrid DS-3 Module include several types of Network Interface Loops (Local, Line, Remote, and Payload) as well as a Backplane Loop. These Loops can be enabled from the *Loop Selection* screen as detailed below. Also available are T3 Framer/LIU Loops, which are described following the Link Diagnostic Loop section.

Figure 22-22 depicts the types of hybrid DS-3 loops.

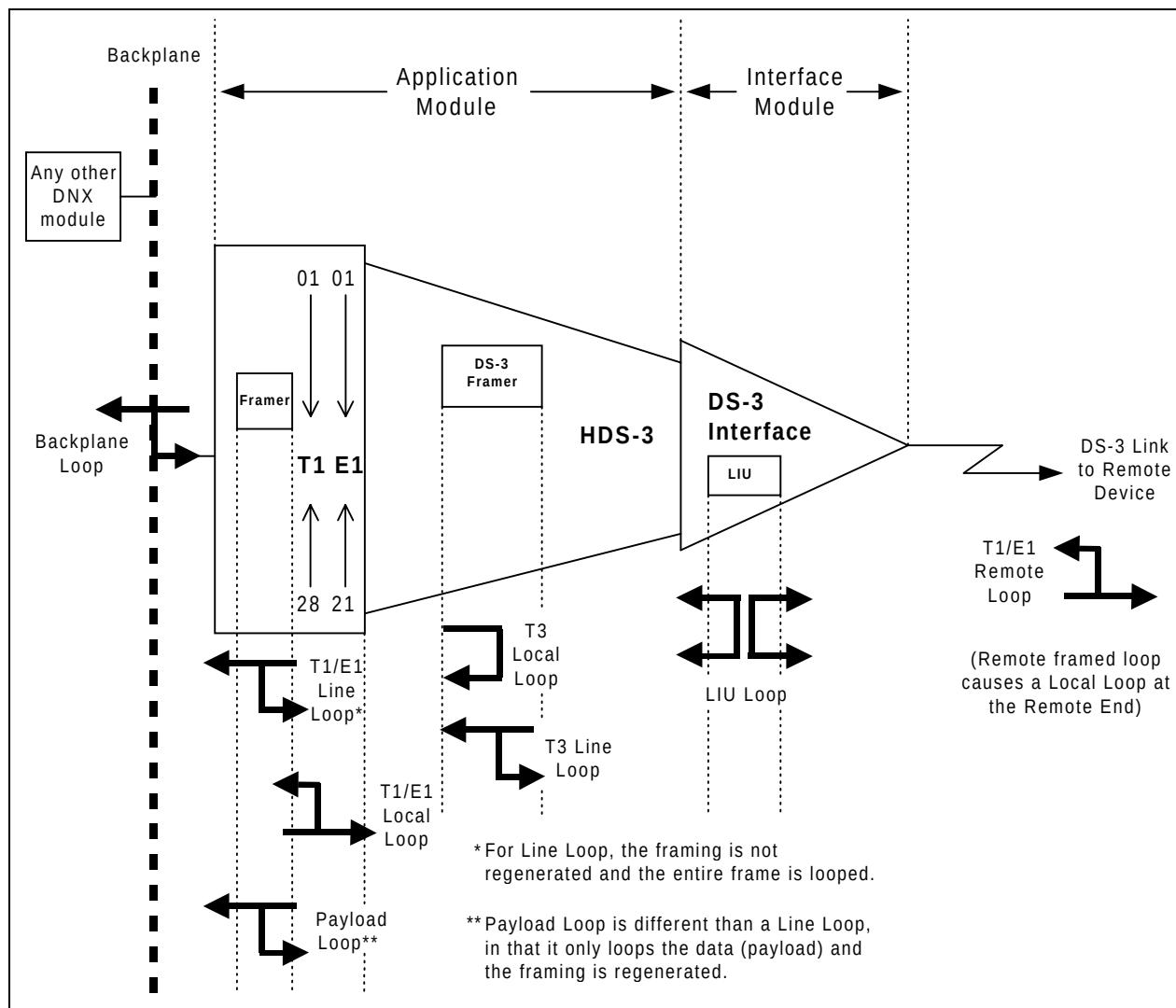


Figure 22-22. Hybrid DS-3 Module Loops

**Select Link  
Diagnostic Loop**

To select a link diagnostic loop:

From the *Diagnostics Manager* submenu, place your cursor on the T1/E1 link you wish to place into loopback and press **L**. The Loop Selection Screen displays (Figure 22-23).

```
Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

 Link: 1

 Loop Selection Screen

 Link Loop Type : Off
 Backplane Loop : Off

Link Loop Type: [O]ff [L]ocal Li[n]e [R]emote [P]ayload
 [1]All Local
 [2]All Line

Backplane Loop: [T]oggle
```

**Figure 22-23. Loop Selection Screen**

3. To select a specific loop, either place the cursor on the *NI Loop* field and press **<Enter>** to cycle through the choices OR press the specific key indicated on the bottom of the menu. The selectable NI loops and their corresponding *hot keys* are as follows:

- **[L]** - to start a local loop
- **[N]** - to start a line loop
- **[R]** - to start a remote loop
- **[P]** - to start a payload loop
- **[1]** - to put all T1/E1 links into local loopback
- **[2]** - to put all T1/E1 links into line loopback
- **[T]** - to toggle the backplane loop

A depiction of the available loop types is provided in Figure 22-22, followed by descriptions of the loops.

4. Once you have selected a loop, press **X** to enable it. The following message appears:

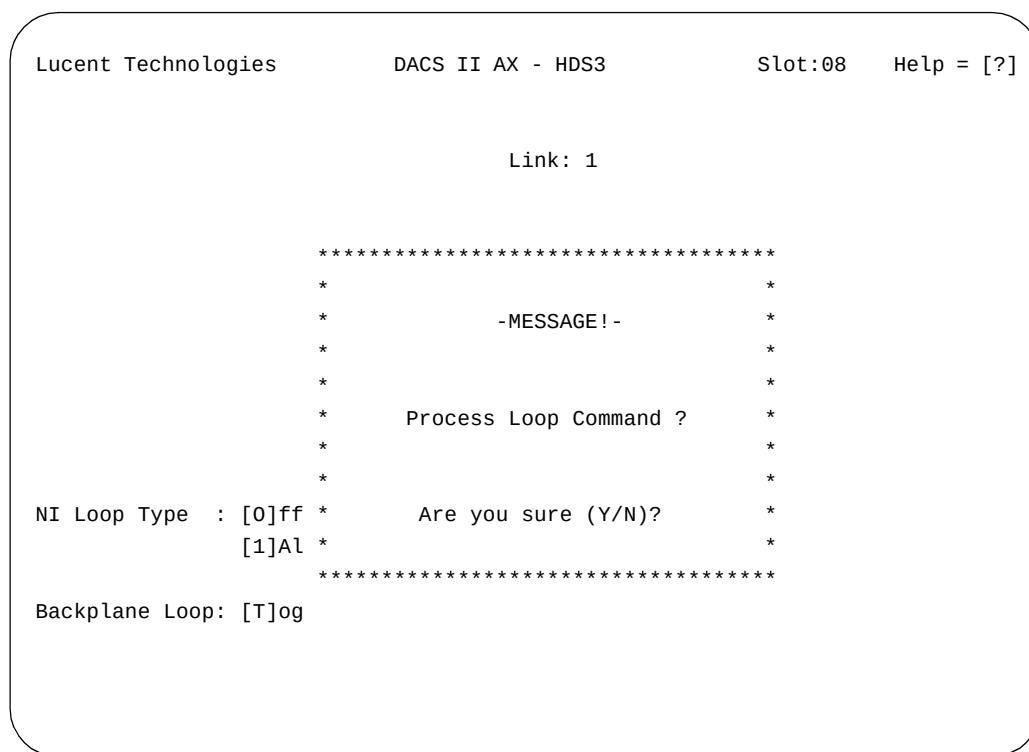


**Figure 22-24. Start Loop Screen**

5. Press **Y** to initiate the loop, and you are returned to the *Diagnostics Manager* submenu. Press **N** to exit and return to the *Diagnostics Manager* submenu.
- 

**Loop Selection  
Screen  
Field Descriptions**

**Local Loop:** Local Loop causes data from the DACS II AX to be looped back to itself at the Network Interface port. (Use in Clear T1/E1 Disabled, Framed, and Unframed Mode.)

**Line Loop:** Line Loop causes frames at the NI to be looped back towards the network from the DACS II AX unit where the command was entered. The framing is not regenerated. In a point-to-point circuit, Line Loop is useful for looping back any testing initiated by the other end. (Use in Clear T1/E1 Disabled, Framed, and Unframed Mode.)

**Remote Loop:** Remote Loop causes a loop at the distant end of a point-to-point circuit, and is useful for looping back testing initiated from the local side. (Use in Clear T1/E1 Disabled Mode.)

**Payload Loop:** Payload Loop is very similar to Line Loop, except that it only loops the data (payload) and the framing is regenerated. (Use in Clear T1/E1 Disabled Mode.)

**Off:** No loop is enabled.

**All Local:** Causes all T1/E1 links to be sent into local loopback. (Use in Clear T1/E1 Disabled, Framed, and Unframed Mode.)

**All Line:** Causes all T1/E1 links to be sent into line loopback. (Use in Clear T1/E1 Disabled, Framed, and Unframed Mode.)

**Backplane Loop:** The Backplane Loop is designed to check the integrity of the Backplane and allow testing through the Hybrid DS-3 port from the remote side to the backplane and back to the tester. Select *Yes* to enable the backplane loop, and *No* to disable the backplane loop.

---

**Select T3 Framer/  
LIU Diagnostic  
Loop**

To select a T3 Framer/LIU diagnostic loop:

1. From the *Diagnostics Manager* submenu, move your cursor to the *T3 Framer* field and press **L**. The T3 Framer/LIU Loop Selection Screen displays (Figure 22-25).

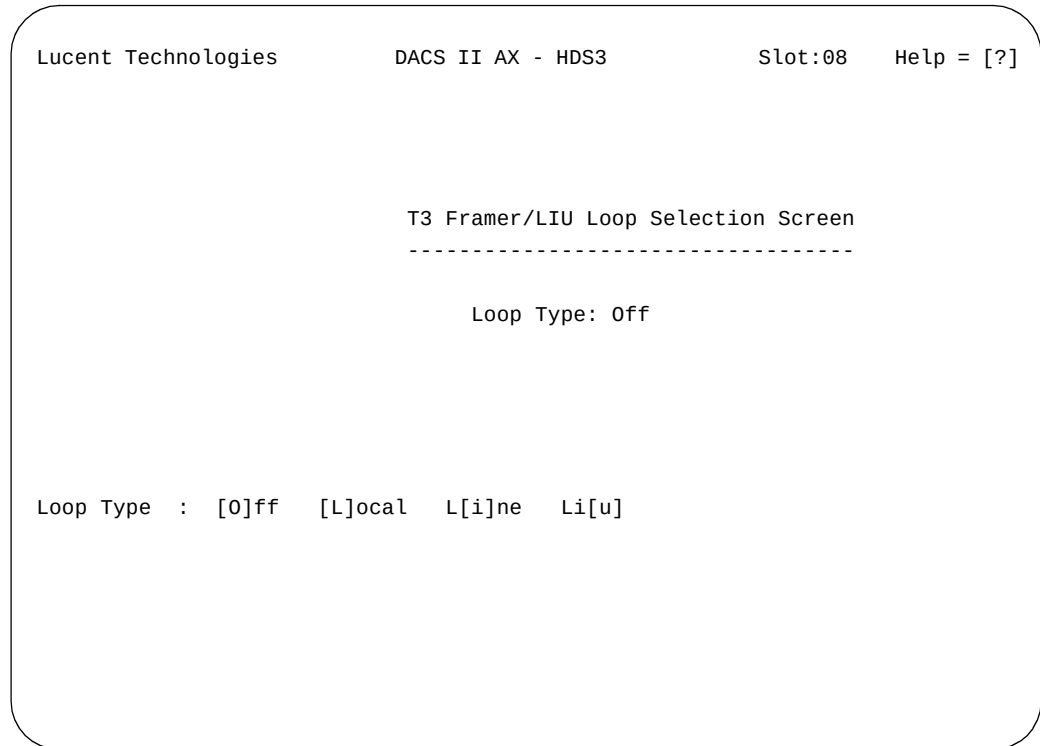


**Figure 22-25. T3 Framer/LIU Loop Selection Screen**

2. To select a specific loop, either place the cursor on the *Loop Type* field and press **<Enter>** to cycle through the choices OR press the specific key indicated on the bottom of the menu. The selectable T3 Framer/LIU Loops and their corresponding *hot keys* are as follows:
  - **[O]** - to turn off DS-3 Framer and LIU Loops
  - **[L]** - to put the DS-3 Framer into Local Loop
  - **[I]** - to put the LIU into Line Loop
  - **[U]** - to put the LIU into Local LoopA depiction of various loop types is provided in Figure 22-22.
3. Once you have selected a loop, press **X** to enable it.

4. When prompted: "Process Loop Command? Are you sure (Y/N)?" Press **Y** to initiate the loop and return to the *Diagnostics Manager* submenu or press **N** to cancel and return to the *Diagnostics Manager* submenu.
-



## ESF Statistics

The ESF Statistics display is a read-only screen. It allows you to view both current and 24-hour ESF Statistics. The Current Statistics column displays the counts for the current time interval (maximum 15 minutes). The 24 Hour Statistics column displays the counts for the preceding 24-hour period. The information has no meaning in Clear T1/E1 Unframed mode.

### View ESF Statistics for a T1/E1 Link

To view ESF statistics for a link:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable link, and press **S**. The *ESF Statistics* display for the selected link appears (Figure 22-26).



**NOTE:**

ESF Statistics can also be displayed from the T1/E1 Link Status submenu by pressing **S**.

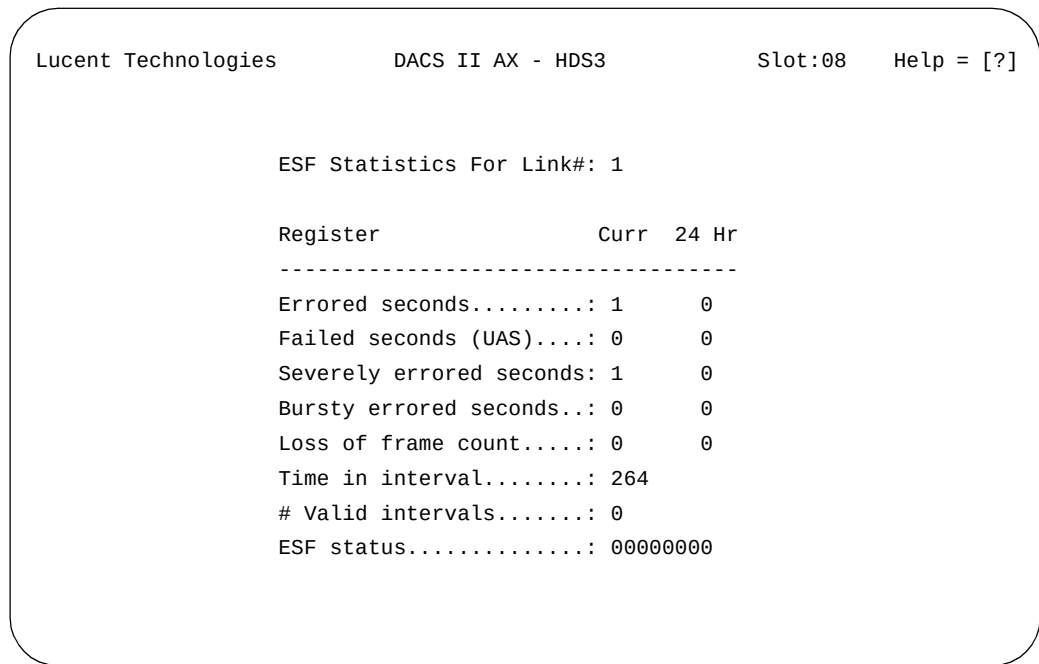


**Figure 22-26. ESF Statistics Display**

## ESF Statistics Display Field Descriptions

---

**Errored Seconds:** The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred.

**Failed Seconds (UAS):** Each one-second period during the occurrence of a Failed Signal State (10 consecutive errored seconds) is known as a failed second. This field displays the number of failed seconds that have occurred.

**Severely Errored Seconds:** A one-second period in which 320 or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.

**Bursty Errored Seconds:** A one-second period in which more than one but less than 320 CRC6 errors have occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

**Loss of Frame Count:** A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.

**Time in Interval:** A timer that tracks the number of seconds (0-900) in one 15-minute interval.

**# Valid Intervals:** A counter that tracks the total number of 15-minute intervals in a 24 hour period (up to 96).

**ESF Status:** This field defines the status of the T1 line. The status is defined by an 8-digit number that is described below:

example: F00000L0

Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.

Digit #2 - "U" or "0" where "U" indicates an unavailable signal state.

Digit #3 through #6 and #8 are always "0."

Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.

---

## ESF Registers

The *ESF Registers Display* is a read-only screen. It displays the same information as the *ESF Statistics Display*, but it is broken down by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period. The information has no meaning in Clear T1/E1 Unframed mode.

To view ESF registers:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable link and press **R**. The *ESF Registers* (Figure 22-27) for the selected link appears.



**NOTE:**

ESF Registers can also be displayed from the T1/E1 Link Status submenu by pressing **R**.

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DACS II AX - HDS3

Slot:08

Help = [?]

ESF registers For Link#: 1

| INT | ES  | FS  | SES | BES | INT | ES  | FS  | SES | BES | INT | ES  | FS  | SES | BES |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 01. | 000 | 000 | 000 | 000 | 17. | 000 | 000 | 000 | 000 | 33. | 000 | 000 | 000 | 000 |
| 02. | 000 | 000 | 000 | 000 | 18. | 000 | 000 | 000 | 000 | 34. | 000 | 000 | 000 | 000 |
| 03. | 000 | 000 | 000 | 000 | 19. | 000 | 000 | 000 | 000 | 35. | 000 | 000 | 000 | 000 |
| 04. | 000 | 000 | 000 | 000 | 20. | 000 | 000 | 000 | 000 | 36. | 000 | 000 | 000 | 000 |
| 05. | 000 | 000 | 000 | 000 | 21. | 000 | 000 | 000 | 000 | 37. | 000 | 000 | 000 | 000 |
| 06. | 000 | 000 | 000 | 000 | 22. | 000 | 000 | 000 | 000 | 38. | 000 | 000 | 000 | 000 |
| 07. | 000 | 000 | 000 | 000 | 23. | 000 | 000 | 000 | 000 | 39. | 000 | 000 | 000 | 000 |
| 08. | 000 | 000 | 000 | 000 | 24. | 000 | 000 | 000 | 000 | 40. | 000 | 000 | 000 | 000 |
| 09. | 000 | 000 | 000 | 000 | 25. | 000 | 000 | 000 | 000 | 41. | 000 | 000 | 000 | 000 |
| 10. | 000 | 000 | 000 | 000 | 26. | 000 | 000 | 000 | 000 | 42. | 000 | 000 | 000 | 000 |
| 11. | 000 | 000 | 000 | 000 | 27. | 000 | 000 | 000 | 000 | 43. | 000 | 000 | 000 | 000 |
| 12. | 000 | 000 | 000 | 000 | 28. | 000 | 000 | 000 | 000 | 44. | 000 | 000 | 000 | 000 |
| 13. | 000 | 000 | 000 | 000 | 29. | 000 | 000 | 000 | 000 | 45. | 000 | 000 | 000 | 000 |
| 14. | 000 | 000 | 000 | 000 | 30. | 000 | 000 | 000 | 000 | 46. | 000 | 000 | 000 | 000 |
| 15. | 000 | 000 | 000 | 000 | 31. | 000 | 000 | 000 | 000 | 47. | 000 | 000 | 000 | 000 |
| 16. | 000 | 000 | 000 | 000 | 32. | 000 | 000 | 000 | 000 | 48. | 000 | 000 | 000 | 000 |

[N]ext Page

**Figure 22-27. ESF Registers Display**

2. Press **N** to view the next 48 intervals.
- 

**Display Links In Service**

To view only the links currently in service:

From the *Diagnostics Manager* submenu, press **I**. The display will refresh, and only those links which are currently in service will appear in the *Diagnostics Manager* submenu. Press the **I** key again, and all of the links are displayed.

<sup>s</sup>

---

---

## ESF Registers Field Descriptions

---

**INT (Interval):** The interval number for the ninety-six 15-minute intervals preceding the current interval, with *01* being the most recent.

**ES (Errored Seconds):** The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred.

**FS (Failed Seconds):** Each one-second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field displays the number of severely errored seconds that have occurred.

**SES (Severely Errored Seconds):** A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.

**BES (Bursty Errored Seconds):** A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

---

## Line Interface Unit (LIU) Monitor

The Line Interface Unit (LIU) Monitor is used to observe the condition of the DS-3 line and report its status.

To view the line status:

From the *Diagnostics Menu*, select *Line Interface Unit (LIU) Monitor*. The Link Interface Unit Monitor appears (Figure 22-28).

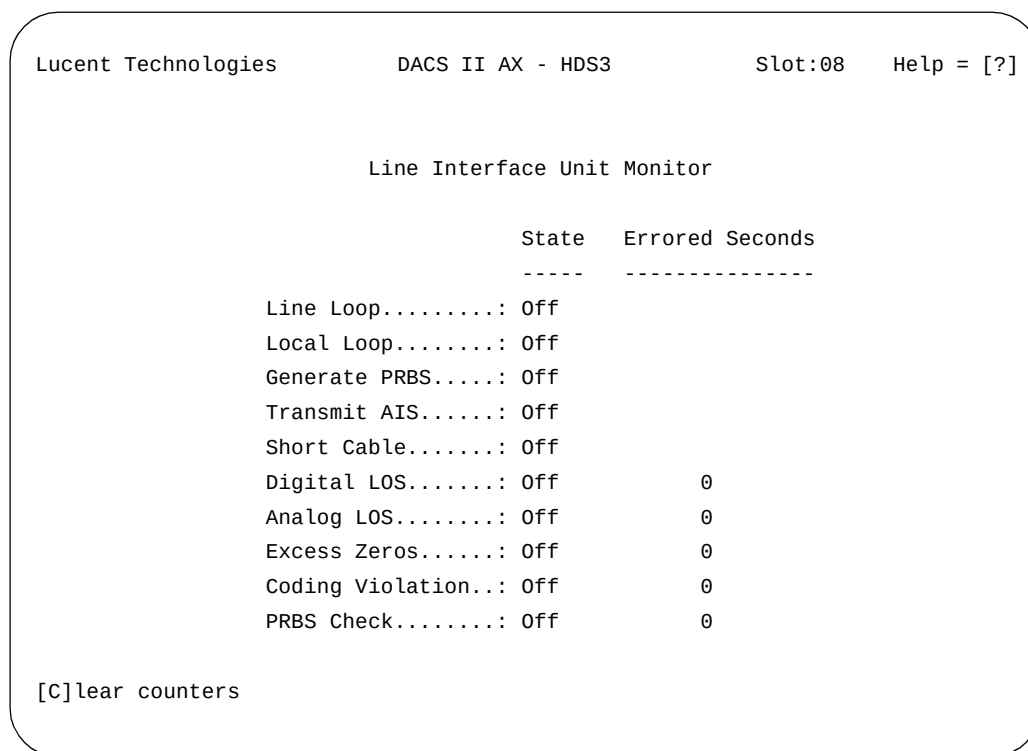


**Figure 22-28. Line Interface Unit Monitor Display**



**NOTE:**

The Line Interface Unit Monitor can also be accessed from the HDS-3 Framer Status Display by pressing **L**.

The *Line Interface Unit Monitor* display shows the status of the line. Press **C** to clear counters.

---

## Line Interface Unit Monitor Display Field Descriptions

---

**State:** Displays the state of the applicable field as either *Off* or *On*.

**Errored Seconds:** A one-second period with one or more errored blocks or at least one defect is known as an errored second. This field displays the number of errored seconds that have occurred for the applicable field.

The states of the following conditions are displayed:

**Line Loop:** *On* indicates that an LIU line loop has been enabled. A depiction of various loop types is provided in Figure 22-22.

**Local Loop:** *On* indicates that an LIU local loop has been enabled. A depiction of various loop types is provided in Figure 22-22.

**Generate PRBS:** PRBS (Pseudo-Random Binary Sequence) is a background test used to monitor the line when LIU BERT is enabled. *On* indicates that this signal is being generated and sent to a remote unit.

**Transmit AIS:** *On* indicates that an AIS (Alarm Indication Signal) is being transmitted to a remote unit.

**Short Cable:** *On* indicates that a short cable (<50') has been configured in the *T3 Port Configuration* submenu.

**Digital LOS:** *On* indicates that the signal has been lost. Specifically, there have been 175 ( $\pm 75$ ) consecutive zeros in the data stream.

**Analog LOS:** *On* indicates that the signal has been lost. Specifically, less than 28% of the data stream is ones.

**Excess Zeros:** *On* indicates that excess zeros have been detected.

**Coding Violation:** *On* indicates that a violation has been detected in the B3ZS coding scheme.

**PRBS Check:** Indicates that the PRBS (Pseudo-Random Binary Sequence) being received from the remote end is currently being checked. *On* indicates that the PRBS is being checked, while *Off* indicates that the PRBS is not being checked.

---

## Monitor Control Signals

The *PCM Signalling Display Menu* is used to display the control signals for a selected link when the link is being used for voice traffic.

To monitor control signals:

1. From the *Diagnostics Menu*, select *Monitor Control Signals*. The PCM Signalling Display Menu appears (Figure 22-29).

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DACS II AX - HDS-3

Slot:08 Help = [?]

Link:01

PCM Signalling Display Menu

| DS0 | To Link | To Bus | DS0 | To Link | To Bus |
|-----|---------|--------|-----|---------|--------|
| 01  | Data    | Data   | 17  | None    | None   |
| 02  | ABCD    | ABCD   | 18  | None    | None   |
| 03  | ABCD    | ABCD   | 19  | None    | None   |
| 04  | __CD    | __CD   | 20  | None    | None   |
| 05  | AB__    | AB__   | 21  | None    | None   |
| 06  | None    | None   | 22  | None    | None   |
| 07  | None    | None   | 23  | None    | None   |
| 08  | None    | None   | 24  | None    | None   |
| 09  | None    | None   | 25  | None    | None   |
| 10  | None    | None   | 26  | None    | None   |
| 11  | None    | None   | 27  | None    | None   |
| 12  | None    | None   | 28  | None    | None   |
| 13  | None    | None   | 29  | None    | None   |
| 14  | None    | None   | 30  | None    | None   |
| 15  | None    | None   | 31  | None    | None   |
| 16  | None    | None   | 32  | None    | None   |

**Figure 22-29. PCM Signalling Display Menu**

2. The *PCM Signalling Display Menu* displays the control signals for a selected link. The only option available is pressing **<Enter>** to select a different link.



---

## PCM Signalling Display Menu Field Descriptions

---

**DS0:** Displays the state of the applicable field as either *Off* or *On*.

**To Link:** Displays the status of signalling towards the link. *None* indicates that the DS0 is not being used. *Data* indicates that the DS0 is being used to pass data. Voice traffic is indicated by the display of signalling bits in an *ABCD* format, depending upon application. A letter (A, B, C, or D) indicates a logic "high" or one, while an underscore indicates a logic "low" or zero.

**To Bus:** Displays the status of signalling towards the DACS II AX backplane. *None* indicates that the DS0 is not being used. *Data* indicates that the DS0 is being used to pass data. Voice traffic is indicated by the display of signalling bits in an *ABCD* format, depending upon application. A letter (A, B, C, or D) indicates a logic "high" or one, while an underscore indicates a logic "low" or zero.

---

## Utilities Menu

The Utilities Menu provides access to two submenus from which you can reset the Hybrid DS-3 Module or set its status as either In Service or Out of Service.

To access the Hybrid DS-3 utilities:

From the *Main Menu*, select *Utilities*. From the *Utilities Menu*, shown in Figure 22-30, you can reset the Hybrid DS-3 Module or change its status to *In Service* or *Out of Service*.

**WARNING:**

*Resetting the module will cause data to be momentarily corrupted.:*

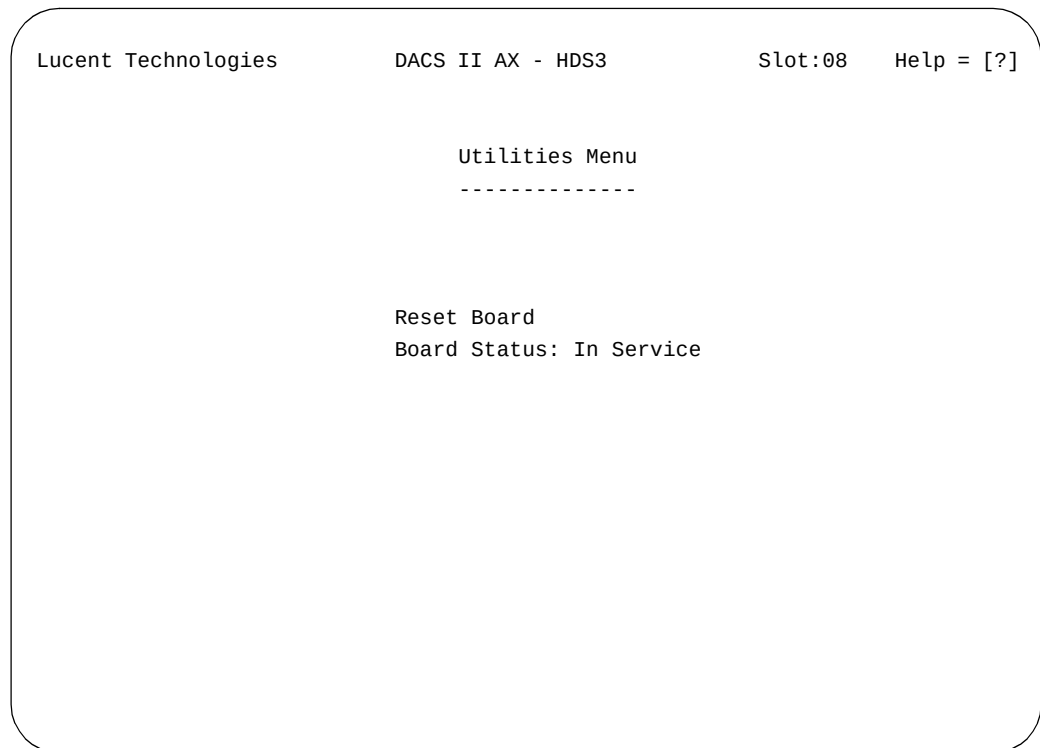


**Figure 22-30. Utilities Menu**

**Reset Hybrid DS-3 Module**

To reset the Hybrid DS-3 module:

The Reset utility causes the Hybrid DS-3 Module to initialize to its power-up configuration. During this boot-up cycle, no user data will flow. Since the configuration resides on the SMC II, connections will be restored.

1. From the *Utilities Menu*, select *Reset Board*. The following message appears:

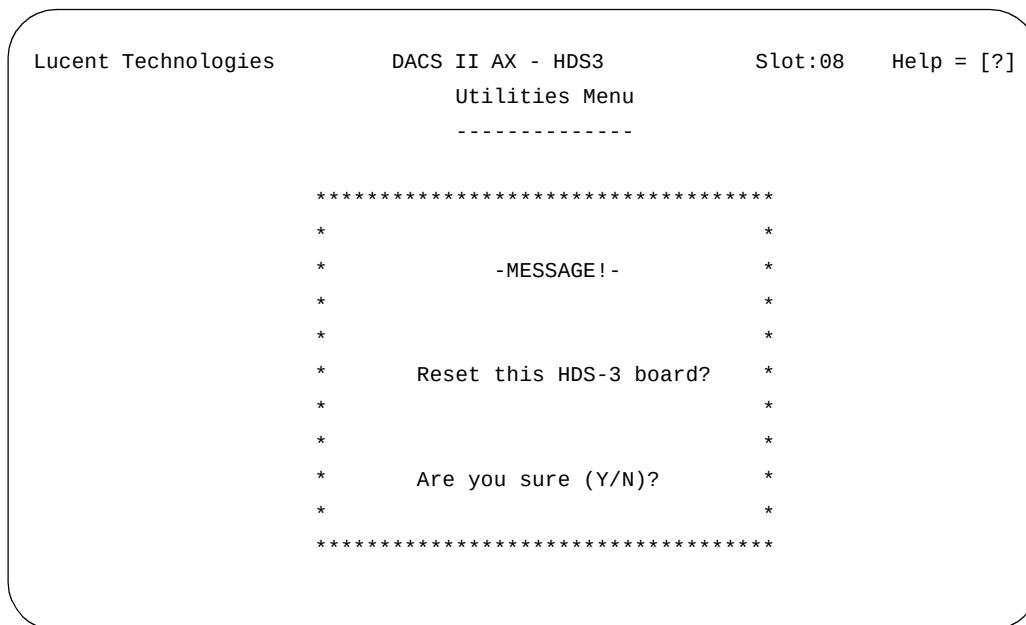


**Figure 22-31. Reset Board Screen**

2. Press **N** to cancel reset.
3. Press **Y** to reset the board. The next screen appears with the following message: "Alert! Please wait while we establish communications with the system manager! Press any key to continue." Wait a few seconds, and you are returned to the *Node Summary Menu*.

**NOTE:**

Once you have been returned to the Node Summary Menu, the Hybrid DS-3 Module's state will cycle through a combination of "Standby", and "Out of Service", and "On-line". This is a normal occurrence when the device resets. Wait for the Device State on the menu to display "On-line" before you proceed.

## Change Board Status

To set the board status:

The Board Status field allows the Administrator to put a device *In Service* or *Out of Service*.



**NOTE:**

If a module is set to "Out of Service", you cannot enter the Diagnostics Menu.

1. From the *Utilities Menu*, select *Board Status*.

If the board status was *In Service*, the following message appears:

Lucent Technologies                      DACS II AX - HDS3                      Slot:08      Help = [?]

Utilities Menu

-----

```

* *
* -MESSAGE! - *
* *
* Set device to Out Of Service? *
* *
* Are you sure (Y/N)? *
* *

```

**Figure 22-32. Board Status Screen**

2. Press **Y**. The board is set to *Out of Service*, and you are returned to the *Utilities Menu*. Press **N**, and you are returned to the *Utilities Menu*.

If the board status was *Out of Service*, the following message appears:

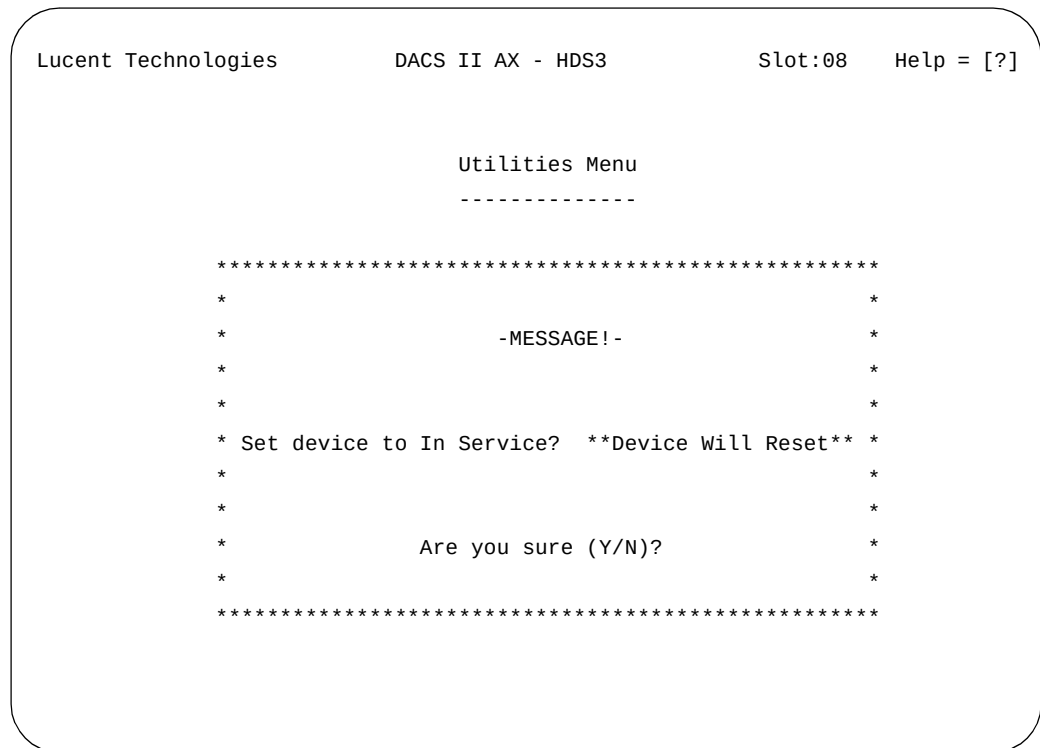


**Figure 22-33. Board Status Screen**

3. Press **Y**. The unit will be reset, the board will be set to "In Service", and you are returned to the *Node Summary Menu*. Press **N**, and you are returned to the *Utilities Menu*.



**NOTE:**

Once you have been returned to the Node Summary Menu, the Hybrid DS-3 Module's state will cycle through a combination of "Standby", "Out of Service" and "On-line". This is a normal occurrence when the device resets. Wait for the Device State on the menu to display "On-line" before you proceed.

## N+1 Redundancy Menu

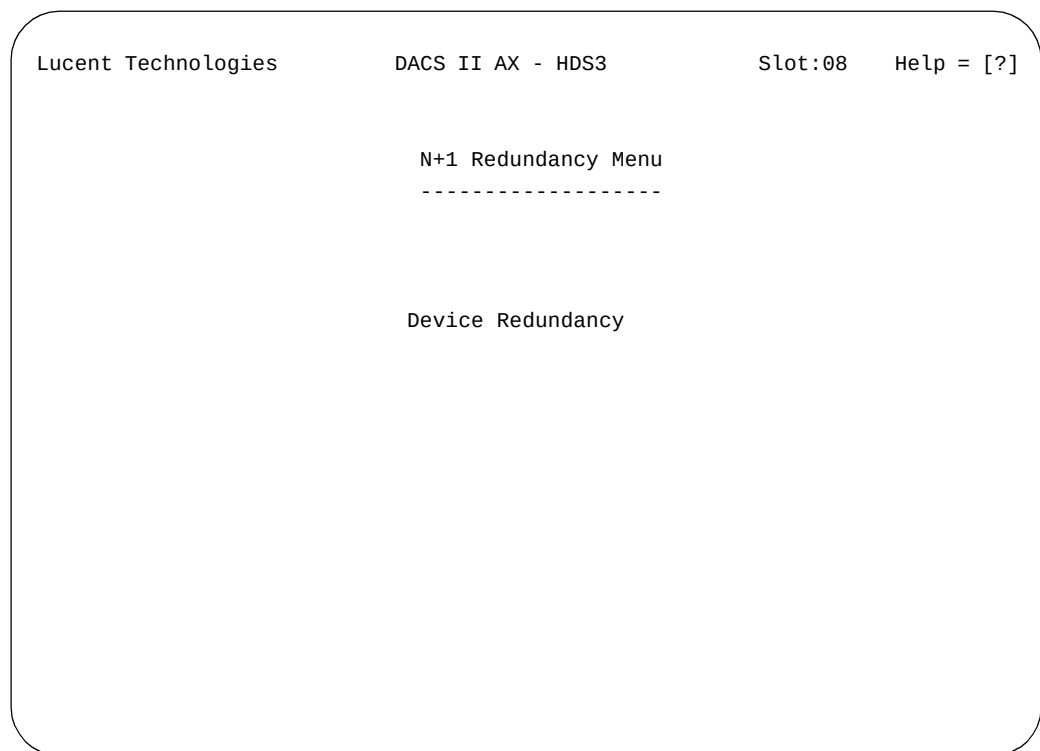
---

The N+1 Redundancy Menu allows you to view N+1 Redundancy Status. It is applicable to DACS II AX-11 units equipped with the N+1 Protection Switch. For specific information and instructions on setting up your Hybrid DS-3 device cards in a Redundancy Group, refer to Chapter 10, N+1 Redundancy.

---

To display N+1 Redundancy information:

1. From the *Main Menu*, select *N+1 Redundancy*. The N+1 Redundancy menu (Figure 22-34) displays.



---

**Figure 22-34. Hybrid DS-3 Module N+1 Redundancy Menu**

2. Select *Device Redundancy*. The N+1 Redundancy Status Menu appears (Figure 22-35).

Lucent Technologies      DACS II AX - HDS3      Slot:08      Help = [?]

N+1 Redundancy Status Menu

Redundancy...: Disabled  
Card Type...: Primary  
Device State: Online

|                                | State | Change Count |
|--------------------------------|-------|--------------|
| -----                          |       |              |
| Frame Sync Pulse.....          | OK    | 0            |
| System Clock.....              | OK    | 0            |
| Backplane Timeslot Management: | OK    | 0            |
| Communication with System Mgr: | OK    | 0            |
| Rear Card.....                 | OK    | 0            |
| Framers.....                   | OK    | 0            |

[C]lear counters

---

**Figure 22-35. N+1 Redundancy Status Menu**

The *N+1 Redundancy Status* menu is a read-only screen.

---

## N+1 Redundancy Status Field Descriptions

---

**Redundancy:** *Enabled* means that the Hybrid DS-3 Module is a member of an N+1 Redundancy Group, while *Disabled* means that it is not a member of an N+1 Redundancy Group.

**Card Type:** Displays whether the Hybrid DS-3 Module is configured as *Primary* or *Secondary*.

**Device State:** Displays the current state of the Hybrid DS-3 Module as either *On-line*, *Off-line*, *Standby*, *Defective*, or *Bus Error*.

**State:** Displays the status of the following:

- **Frame Sync Pulse:** If the state is *Missing*, it indicates a loss of synchronization error.
  - **System Clock:** If the state is *Missing*, it indicates a loss of system clock.
  - **Backplane Timeslot Management:** If the state is *Invalid*, it indicates that the backplane is flooded with more timeslots than the card can handle.
  - **Communication with System Mgr:** If the state is *Lost*, it indicates that the device has not received any messages from the SMC II for more than one minute. If the state reads "Lost", you most likely have problems with your Hybrid DS-3 Module, not the SMC II.
  - **Rear Card:** If the state is *Missing*, it indicates the rear card is not being detected. The device will reset after the rear card is detected again.
  - **Framers:** If the state is *Bad*, it indicates one of the T1/E1 framers or the DS-3 framer is bad (hardware failure).
-



## About Menu

The About Menu displays version, release date, and checksum information for the Hybrid DS-3 Module software, and version information for the Hybrid DS-3 Module hardware.

To display module identification information:

From the *Main Menu*, select *About*. The About HDS-3 Module menu displays (Figure 22-36). The *About HT3 Module* display is a read-only screen. .

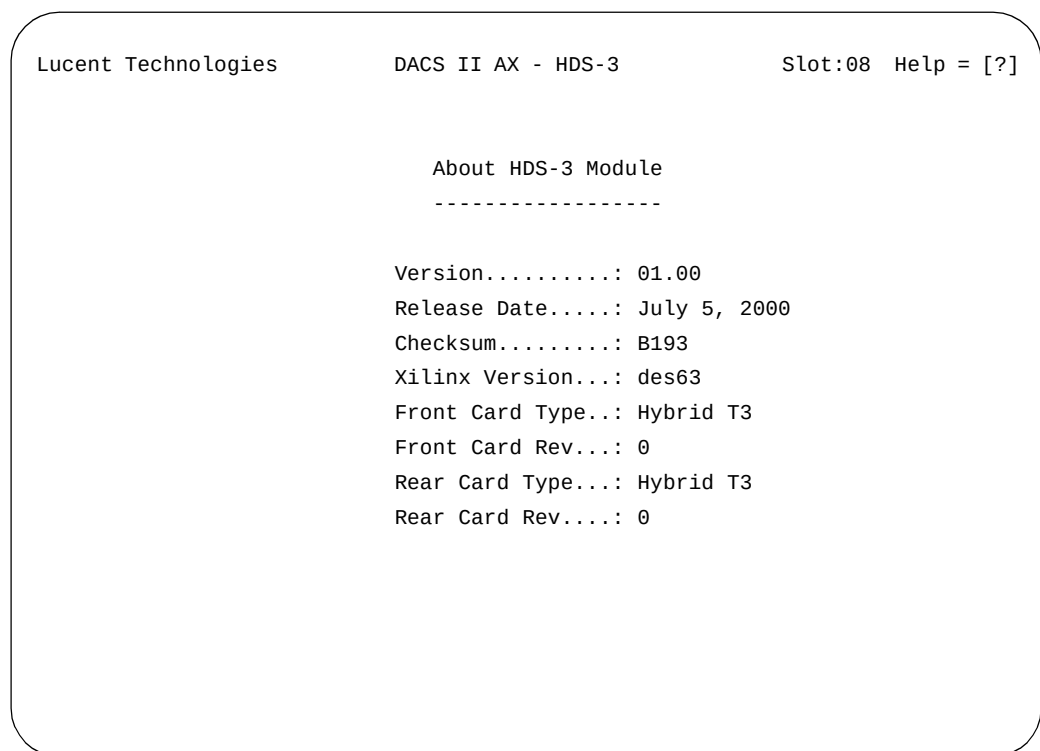


**Figure 22-36. About HT3 Module Display**

---

## About Menu Field Descriptions

---

**Version:** Displays the software version currently residing in the Hybrid DS-3 Module's flash memory.

**Release Date:** Displays the date of software release.

**Checksum:** Displays the sum of all bytes in the Hybrid DS-3 Module's flash memory at power up. Also used to identify software version.

**XILINX Version:** Displays the hardware version of downloadable, programmable devices.

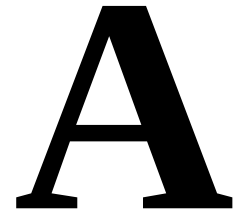
**Front Card Type:** Displays the type of Application Module in the system.

**Front Card Rev:** Displays the Application Module's hardware revision level.

**Rear Card Type:** Displays the type of Interface Module in the system.

**Rear Card Rev:** Displays the Interface Module's hardware revision level.

---



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## **Background**

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### **TFTP**

Use TFTP (Trivial File Transfer Protocol) to download software upgrades to the DACS II AX. You can use TFTP through a local LAN connection or remotely through a routed LAN environment. Copy the software upgrade files to the Host PC which will be running the TFTP Client application; the DACS II AX will recognize the transfer and automatically become the TFTP Server.

---

---

## Upgrading the SMC Software

---

### Overview

Software upgrades to the DACS II AX System Manager Card and application modules is done using TFTP client software from a LAN connection. Software upgrades should be initiated only when necessary.

To upgrade the SMC:

- Copy the upgrade software to a host PC which is running the TFTP Client application.
  - TFTP the upgrade software to the active SMC.
  - When the upgrade is complete, the active SMC will reset and the standby SMC becomes active.
  - If there are redundant SMCs, repeat the upgrade procedure on the second SMC.
- 

### Before you begin

Before you begin a software upgrade, verify the following:

- The TFTP client application is installed on the host PC.
  - The host PC is connected to the DACS II AX by a local LAN connection or remotely through a routed LAN environment. Upgrades cannot be done using a local terminal or the phone line.
  - If there are redundant System Managers on the DACS II AX, verify that the databases are in sync. Log in to the DACS II AX and look at the top left corner of the Main Menu, verify that the message "DataBases are InSync" displays. If the databases are not in sync, select Utilities, then select Copy File System.
  - If there are users on the system, an SMC upgrade will cause them to be logged out.
- 

### Displaying the Current SMC Software Version

To display the current SMC Software Version, from the DACS II AX Main Menu, select About, then select System Profile.

---

## Upgrading the SMC Software (Continued)

---

### Upgrade SMC Software Procedure

To upgrade the SMC software:

1. Copy the upgrade software to a host PC.
  2. Open the TFTP client application on the host PC.
  3. Type in the IP address of the DACS II AX. (Depending on the TFTP software being used, this field may be labeled Destination, Host, or Target).
  4. Enter or select the path on the PC for the bin file for the new SMC code.  
DO NOT alter the file name. The remote path does not have to match the local path.
  5. Start the transfer. (Depending on the TFTP software being used, you may need to click OK, or SEND, or press ENTER.  
The DACS II AX will recognize the transfer and automatically become the TFTP Server.
  6. When the code transfer is complete, the online SMC will reset and burn the upgrade code into flash memory.
  7. If the DACS II AX is equipped with redundant SMCs:  
At the completion of the first SMC upgrade, the upgraded SMC will reset and the off-line SMC will take over and become the online SMC.
  8. Log in to the DACS II AX and verify the version number on the first SMC upgraded. Switch over SMCs and verify the SMC version number.
  9. Switch over to the second SMC and repeat this procedure to upgrade the second SMC.
-

---

## Upgrading an Application Module

---

### Overview

To upgrade an application module, you complete the following:

- Copy the new program file to a host PC
  - Download the new program file from the host PC to the SMC flash memory
  - Download the new program file from the SMC to the application module
  - Delete the new program file from the SMC.
- 

### Before you begin

Before you begin a software upgrade, verify the following:

- N + 1 redundancy must be disabled prior to upgrading application modules.
  - The TFTP client application is installed on the host PC.
  - The host PC is connected to the DACS II AX by a local LAN connection or remotely through a routed LAN environment. Upgrades cannot be done using a local terminal or the phone line.
  - If there are redundant System Managers on the DACS II AX, verify that the databases are in sync. Log in to the DACS II AX and look at the top left corner of the Main Menu, verify that the message "DataBases are InSync" displays. If the databases are not in sync, select Utilities, then select Copy File System.
  - This will take the application module out-of-service for approximately 30 seconds, depending on the card type. It is suggested that an upgrade be performed during an available maintenance window.
- 

### Displaying the Application Module's Current Software Version

To display the current Software Version for the application modules, from the DACS II AX Main Menu, select Utilities, then select Download Devices Software.

---

### Clock Source

**Important:** Before upgrading application module software, make sure the application module is not being used as your clock reference. If the application module is being used as the clock reference, specify another module as the clock source before doing the upgrade.

---



## Upgrading an Application Module (Continued)

```
Lucent Technologies DACS II AX 11 - System Manager Help = [?]

 Program Load Menu

 Current Program File: wbd203b.bin

Slot# Type Program Version Device State
----- -
01 Octal T1/E1 02.03 Standby
02 Octal T1/E1 02.03 Onliney
03 Octal T1/E1 02.03 Online
04 Test Access TAM 4.01 Online
05 -----
06 Quad T1 QT1_7.01 Online
07 STS-1 01.00 Online
08 Octal High Speed 01.01b Online
09 Hybrid T3 01.00 Online
10 T3 T3 2.01 Online
11 T3 T3 2.01 Standby

PSX ProtectionSwitch PSX 1.01 Online
[L]oad device Load [a]ll devices [D]elete program file
```

**Figure A-1. Program Load Menu**

## Upgrading an Application Module (Continued)

### Upgrade Application Module Procedure

To upgrade an Application Module with a new program file:

1. Copy the upgrade software to a host PC.
2. Open the TFTP client application on the host PC.
3. Type in the IP address of the DACS II AX. (Depending on the TFTP software being used, this field may be labeled Destination or Target).
4. Enter or select the path on the PC for the new program file. For example, software file *wbd0101d.bin*.  
  
DO NOT alter the file name. The remote path does not have to match the local path.
5. Start the transfer. (Depending on the TFTP software being used, you may need to click OK, or SEND, or press ENTER.)  
  
When the code transfer is complete, the new program file is put in the SMC's memory.
6. From the DACS II AX Main Menu, select Utilities, then select Download Devices Software.  
  
The Program Load Menu displays (Figure A-1).
7. The entry in the Current Program field is the program currently in the SMC's flash memory. Verify that the entry in the Current Program File field is the program that you want to download to the application module.
  - If ??? None ??? is listed, then a program has not been downloaded to the SMC.
  - If the wrong Program File is listed, delete the program from the SMC by typing **D**, then go back to step 1.
  - The name of the file must contain a valid prefix and suffix, otherwise an error message will appear in the event log.
8. Choose one of these two ways to download the program file:
  - To download the program file to a specific slot, move the cursor to the Slot# and type **L** or press **Enter**.
  - To download the program file to all modules with that Card type, type **A**.

For example, if the Current Program File is a new program version for the Octal High Speed Module and you type **A**, then all of the Octal High Speed Modules in the DACS II AX will be updated one at a time. The software will not be downloaded to modules of any other type.

9. When you have downloaded the new program file, delete the Current Program File from the SMC by typing **D**.
-

## **Telnet**

---

The DACS II AX system supports multiple telnet sessions. Telnet is a protocol that allows users to log on to remote hosts. It creates a Network Virtual Terminal (NVT) across the internetwork so that it appears as if a user is logged directly into the supervisory port.

### **Procedure**

In order to use Telnet, an IP address for the DACS II AX must have already been established and entered on the DACS II AX Port Configuration Menu.

1. Start Telnet (connect to Telnet using the software on your host). Enter the host name of the DACS II AX that you wish to connect to, and the IP address for the LAN port.
-

## Multiple Telnet Sessions

### Number of Telnet Sessions

The DACS II AX system can support up to four simultaneous telnet sessions. With certain restrictions, up to eight simultaneous telnet sessions can be supported.

### Application Module Restrictions

Only one user can make changes to an application module. All other users on that application module will have view-only access, regardless of their assigned security level. The user who is allowed to make changes is the first user who logs into the application module with an Administration or Provisioning security level.

When the *"locked"* message appears, as shown in Figure A-2, press **<Enter>** to proceed as a view-only user.

```
Lucent Technologies DACS II AX T1/E1 Slot: 01 Help = [?]

 Main Menu

* *
* *
* -Hit any key to continue- *
* *
* *
* This screen is Locked by - alpha -. Activating View Only Access*
* *
* *
* *
* *

```

**Figure A-2. View-only Access Message**

**DACS II AX  
Backplane  
Restrictions**

If more than four users try to telnet into the DACS II AX, a message appears on the screen stating the max (4) allowed sessions are in use (Figure A-3).

```

Lucent Technologies DACS II AX-11 - System Manager Help = [?]
Standby SMC not present N+1 Redundancy State: Frozen
Alarm Contacts...: Enabled

 Node Summary Menu

Slot# Con
----- --- *****
01 0c *
02 0c * -Hit any key to continue-
03 0c *
04 0c *
05 0c * Currently the max (4) allowed VT sessions are in use.*
06 0c *
07 0c *
08 0c *
09 Qu *
10 Te *****
11 Qu
SMCA System Manager A Online None
SMCB System Manager B Not Present None
PSX ProtectionSwitch Not Present Critical

[C]lear error counts [S]lot Cfg [E]xpose [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver [R]estore

```

**Figure A-3. Maximum Number of Telnet Sessions Message**

**Example of  
Multiple Telnet  
Sessions**

Table A-1 shows multiple telnet sessions and allowed access, based on order and security level.

**Table A-1. Example of Multiple Telnet Sessions**

| Telnet Session | Area                 | Security Level | Sequence        | Allowed Access                                                                                                                               |
|----------------|----------------------|----------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1              | Application Module 1 | Administrator  | First           | Write Access                                                                                                                                 |
| 2              | Application Module 1 | Provisioning   | Second          | Read Only                                                                                                                                    |
| 3              | Application Module 1 | Administrator  | Third           | Read Only                                                                                                                                    |
| 4              | Application Module 2 | Administrator  | First           | Write Access                                                                                                                                 |
| 5              | DACS II AX Backplane | Administrator  | Not applicable. | On unrelated screens, last changes made are last changes saved.<br><br>On related screens, one user has write access, others have read only. |
| 6              |                      | Provisioning   |                 |                                                                                                                                              |
| 7              |                      | Test           |                 |                                                                                                                                              |
| 8              |                      | View Only      |                 |                                                                                                                                              |

**Related and  
Unrelated Screens**

Unrelated screens can be changed simultaneously. For example, one user can update the *Time Of Day* screen while another uses the *Ping* Command.

When an update on one screen impacts other screens, the related screens are locked and users will have view-only access. Related screens are locked to prevent multiple users from making conflicting changes. For example, a change in the *Slot Configuration* screen may impact the *Connection Map Configuration* screen, therefore the ability to configure these screens are only available to the initial user. All other users will have view only privileges.

**Menu Access  
Chart**

Table A-2 through Table A-7 summarize the type of access rules that apply on each of the DACS II AX menus.

**KEY**

***Accessible:*** All users with write privileges can access these screens and make changes. If two users have write privileges and make changes, then the changes made by the last user to exit the screen will take effect.

***Protected/View only:*** Only the initial user (i.e., depending upon security level) has write privileges; all other users have view-only privileges. If the initial user has a view-only security level, than a subsequent user with a higher security level can access the screen with write privileges. For example, one user can access the *Node Profile* screen while another user accesses the *Ping* screen but each screen can be *viewed* by subsequent users. In fact, subsequent users will get a message, as shown in screen B-2, that reads as follows: "*This screen is locked by -X-. Activating View Only Access.*"



**Table A-2. SMC Menu Access**

| Menu Name                      | Access Rules                  |
|--------------------------------|-------------------------------|
| <b>NODE SUMMARY</b>            |                               |
| <b>CONNECTION MAPS MANAGER</b> |                               |
| Active Map                     | Protected/View only           |
| Map Configuration              | Protected/View only           |
| Map Definition                 | Protected/View only           |
| Time of Day Configuration      | Protected/View only           |
| Date and Time                  | Protected/View only           |
| Save and Restore Database      | Protected/View only           |
| <b>SYSTEM CONFIGURATION</b>    |                               |
| Slot Configuration             | Protected/View only           |
| Node Profile                   | Protected/View only           |
| System Clock Source            | Accessible                    |
| Users Menu                     | Accessible by Admin user only |
| Port IP Addresses              | Accessible                    |
| SNMP Agent Configuration       | Accessible                    |
| Date and Time                  | Protected/View only           |
| Save and Restore Database      | Protected/View only           |
| Restore Rev. 0 Database Files  | Accessible                    |
| <b>EVENTS</b>                  |                               |
| Monitor Events                 | Accessible                    |
| Display Event Log              | Accessible                    |
| Event Configuration            | Accessible                    |
| <b>UTILITIES</b>               |                               |
| Copy File System               | Protected/View only           |
| Switchover SMCs                | Accessible                    |
| Trace IP                       | Accessible                    |
| MIB Table                      | Accessible                    |
| Ping                           | Protected/View only           |
| IP Route Table                 | Accessible                    |
| Show IP Route                  | Accessible                    |
| Dump IP Route                  | Accessible                    |
| ARP Table                      | Accessible                    |
| Return to Default Settings     | Accessible                    |
| Backplane Timeslots Display    | Protected/View only           |
| Initialize SMC Rearcard Modem  | Accessible                    |

**Table A-2. SMC Menu Access (Continued)**

| Menu Name                  | Access Rules        |
|----------------------------|---------------------|
| File System Debug Counters | Accessible          |
| Download Devices Software  | Protected/View only |
| Reset All Channel Cards    | Protected/View only |
| Agent-Y Debug              | Accessible          |
| Display Resources          | Accessible          |
| Display Resource Manager   | Accessible          |
| Register Dump              | Accessible          |
| <b>ABOUT</b>               |                     |
| System Profile             | Accessible          |
| Who Am I                   | Accessible          |

**WARNING:**

*If you copy a Connection Map while multiple Telnet sessions are open, the other Telnet sessions will disconnect due to processor utilization. The other sessions will be unable to re-connect while the map is being copied.*

**Table A-3. Quad High Speed Multi-user Menus**

| Menu Name                           | Accessibility       |
|-------------------------------------|---------------------|
| <b>CONFIGURATION</b>                | Protected/View only |
| <b>DIAGNOSTICS</b>                  | Accessible          |
| <b>ADVANCED UTILITIES</b>           |                     |
| Options                             | Accessible          |
| Board Status                        | Accessible          |
| Buffer Watch                        | Accessible          |
| Reset Quad High Speed Board         | Accessible          |
| Monitor System Manager Clock        | Accessible          |
| <b>MEMORY MANAGEMENT</b>            |                     |
| Dump Memory                         | Accessible          |
| Change Memory                       | Accessible          |
| Display Queues                      | Accessible          |
| <b>TIME SLOT ASSIGNMENT DISPLAY</b> |                     |
| Write to Backplane Display          | Accessible          |
| Read from Backplane Display         | Accessible          |
| SYSTEM MANAGER INTERFACE            | Accessible          |
| DISPLAY RESOURCE CHANGES            | Accessible          |
| <b>ABOUT</b>                        | Accessible          |

**Table A-4. Quad T-1 Multi-user Menus**

| Menu                                | Accessibility       |
|-------------------------------------|---------------------|
| <b>CONFIGURATION</b>                | Protected/View only |
| <b>STATISTICS</b>                   |                     |
| ESF Statistics                      | Accessible          |
| ESF Registers                       | Accessible          |
| <b>DIAGNOSTICS</b>                  | Accessible          |
| <b>ADVANCED UTILITIES</b>           | Accessible          |
| <b>OPTIONS</b>                      | Accessible          |
| Board Status                        | Accessible          |
| Buffer Watch                        | Accessible          |
| Monitor System Manager Clock        | Accessible          |
| Reset Quad T-1 Board                | Accessible          |
| Debug Event                         | Accessible          |
| <b>VOICE DEBUGGER</b>               | Accessible          |
| Voice Control Signal Display        | Accessible          |
| Test Voice Signals                  | Accessible          |
| <b>MEMORY MANAGEMENT</b>            | Accessible          |
| Dump Memory                         | Accessible          |
| Change Memory                       | Accessible          |
| <b>FRAMER MANAGEMENT</b>            | Accessible          |
| Dump Framer Registers               | Accessible          |
| Dump PCM Control Registers          | Accessible          |
| <b>ESF MESSAGE DRIVER</b>           | Accessible          |
| <b>TIME SLOT ASSIGNMENT DISPLAY</b> | Accessible          |
| <b>SYSTEM MANAGER INTERFACE</b>     | Accessible          |
| <b>DISPLAY RESOURCE CHANGES</b>     | Accessible          |
| <b>ABOUT</b>                        | Accessible          |

**Table A-5. T3 Multi-user Menus**

| Menu Name                         | Accessibility       |
|-----------------------------------|---------------------|
| <b>CONFIGURATION</b>              |                     |
| T1 Configuration Manager          | Accessible          |
| T1 Channel Configuration          | Protected/View only |
| T3 Port Configuration             | Protected/View only |
| Options                           | Protected/View only |
| <b>DIAGNOSTICS</b>                |                     |
| Line Diagnostics Center           | Accessible          |
| T1/DS1 Loop Select Screen         | Accessible          |
| T3/LIU Loop Select screen         | Accessible          |
| ESF Statistics for T1 Channel     | Accessible          |
| ESF Registers for T1 Channel      | Accessible          |
| T1 Frammer Channel Status         | Accessible          |
| T3 Frammer Status Display         | Accessible          |
| Link Timeslot Profile Display     | Accessible          |
| Active TSFM Display               | Accessible          |
| TSFM Statistics Display           | Accessible          |
| Debug Backplane Connection        | Accessible          |
| Complete TSFM Display             | Accessible          |
| Line Interface Unit (LIU) Display | Accessible          |
| Registers Dump                    | Accessible          |
| <b>UTILITIES</b>                  |                     |
| System Manager Interface          | Accessible          |
| Reset Board                       | Accessible          |
| Buffer Watch                      | Accessible          |
| Dump Memory                       | Accessible          |
| Change Memory                     | Accessible          |
| Display Queues                    | Accessible          |
| Display Resource Changes          | Accessible          |
| <b>ABOUT</b>                      | Accessible          |

**Table A-6. Octal Voice EM Multi-user Menus**

| Menu Name                       | Accessibility       |
|---------------------------------|---------------------|
| <b>CONFIGURATION</b>            | Protected/View only |
| <b>DIAGNOSTICS</b>              | Accessible          |
| <b>UTILITY</b>                  | Accessible          |
| Display Voice Signalling Status | Accessible          |
| Display Codec Registers Content | Accessible          |
| Display Backplane Time Slots    | Accessible          |
| Link Time Slot Profile Display  | Accessible          |
| Monitor Backplane Status        | Accessible          |
| Backplane Integrity             | Accessible          |
| System Manager Interface        | Accessible          |
| Resource Manager                | Accessible          |
| Dump Memory Content             | Accessible          |
| Reset Board                     | Accessible          |
| <b>ABOUT</b>                    | Accessible          |

**Table A-7. Octal T1/E1 Multi-user Menus**

| <b>Menu Name</b>                     | <b>Accessibility</b> |
|--------------------------------------|----------------------|
| <b>CONFIGURATION</b>                 | Protected/View only  |
| <b>Links Configuration</b>           | Protected/View only  |
| <b>DIAGNOSTICS</b>                   | Accessible           |
| <b>Bert Select</b>                   | Accessible           |
| <b>Loop Select Screen</b>            | Accessible           |
| <b>E1/T1 Link Status</b>             | Accessible           |
| <b>ESF Statistics</b>                | Accessible           |
| <b>ESF Registers</b>                 | Accessible           |
| <b>G.826 Statistics</b>              | Accessible           |
| <b>Link Timeslot Profile Display</b> | Accessible           |
| <b>Active TSFM Display</b>           | Accessible           |
| <b>Debug Backplane Connection</b>    | Accessible           |
| <b>Complete TSFM Display</b>         | Accessible           |
| <b>Registers Dump</b>                | Accessible           |
| <b>Backplane Check</b>               | Accessible           |
| <b>System Status</b>                 | Accessible           |
| <b>UTILITIES</b>                     | Accessible           |
| <b>System Manager Interface</b>      | Accessible           |
| <b>Resource Display</b>              | Accessible           |
| <b>Buffer Watch</b>                  | Accessible           |
| <b>Dump Memory</b>                   | Accessible           |
| <b>Change Memory</b>                 | Accessible           |
| <b>Display Queues</b>                | Accessible           |
| <b>Tsfm - Reload Cfg</b>             | Accessible           |
| <b>Tsfm - Refresh</b>                | Accessible           |
| <b>Tsfm - Verify</b>                 | Accessible           |
| <b>Tsfm &amp; Framers Refresh</b>    | Accessible           |
| <b>Options</b>                       | Accessible           |
| <b>Reset Device</b>                  | Accessible           |
| <b>Board Status</b>                  | Accessible           |
| <b>ABOUT</b>                         | Accessible           |





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## System Manager Interface

**Ethernet AUI Port** The AUI port provides a DB-15 pin receptacle for connection using thick Ethernet cabling.

**Table B-1. Ethernet Port AUI (DB-15)**

|    |                  |
|----|------------------|
| 1  | chassis          |
| 2  | CI+              |
| 3  | DO+              |
| 4  | chassis          |
| 5  | DI+              |
| 6  | signal ground    |
| 7  | not used         |
| 8  | not used         |
| 9  | CI-              |
| 10 | DO-              |
| 11 | chassis          |
| 12 | DI-              |
| 13 | +12V@.25 A (max) |
| 14 | chassis          |
| 15 | not used         |

**Ethernet 10Base-T port** The Ethernet 10Base-T port provides an RJ45 connector for connection using twisted pair cabling.

**Table B-2. Ethernet 10Base-T**

| 10Base-T<br>(RJ45) |          |
|--------------------|----------|
| 1 transmit pair    | TX+      |
| 2 transmit pair    | TX-      |
| 3 receive pair     | RX+      |
| 4                  | not used |

**Table B-2. Ethernet 10Base-T**

|                |          |
|----------------|----------|
| 5              | not used |
| 6 receive pair | RX-      |
| 7              | not used |
| 8              | not used |

**Terminal Port**

The terminal port allows you to connect to an external terminal, providing RJ11 modular connectors.

**Table B-3. Terminal (TERM) Port**

| Term Port (RJ11) | DCE            |
|------------------|----------------|
| 1                | signal ground  |
| 2                | CTS (output)   |
| 3                | RTS (input)    |
| 4                | RXD (output)   |
| 5                | TXD (input)    |
| 6                | chassis ground |

**Phone Line**

The phone line provides an RJ11 6-position, 4 pin modular jack. The pin assignments are listed below:

**Table B-4. RJ11**

|   |        |
|---|--------|
| 1 | vacant |
| 2 | NC     |
| 3 | RING   |
| 4 | Tip    |
| 5 | NC     |
| 6 | vacant |

## Application Module Interfaces

### Quad High Speed Interfaces

The standard serial port interface provides (4) DB-25 pin receptacles and supports RS232, RS530 or V.35 interfaces.

**Table B-5. DACS II AX Interface**

| Pin | RS232         | RS530       | V.35        |
|-----|---------------|-------------|-------------|
| 1   | chassis       | chassis     | chassis     |
| 2   | TXD in        | TXD (A)     | TXD (A)     |
| 3   | RXD out       | RXD (A)     | RXD (A)     |
| 4   | RTS in        | RTS (A)     | RTS         |
| 5   | CTS out       | CTS (A)     | CTS         |
| 6   | DSR out       | DSR (A)     | DSR         |
| 7   | signal gnd    | signal gnd  | signal gnd  |
| 8   | DCD out       | DCD (A)     | DCD         |
| 9   | (voltage+)    | RXC (B)     | RXC (B)     |
| 10  | (voltage-)    | DCD (B)     | not used    |
| 11  | not used      | EXT TXC (B) | EXT TXC (B) |
| 12  | not used      | TXC (B)     | TXC (B)     |
| 13  | not used      | CTS (B)     | not used    |
| 14  | not used      | TXD (B)     | TXD (B)     |
| 15  | TXC out       | TXC (A)     | TXC (A)     |
| 16  | not used      | RXD (B)     | RXD (B)     |
| 17  | RXC out       | RXC (A)     | RXC (A)     |
| 18  | not used      | not used    | not used    |
| 19  | not used      | RTS (B)     | not used    |
| 20  | DTR in        | DTR (A)     | DTR         |
| 21  | not used      | not used    | not used    |
| 22  | (RI) not used | DSR (B)     | not used    |
| 23  | not used      | DTR (B)     | not used    |
| 24  | EXT TXC in    | EXT TXC (A) | EXT TXC (A) |
| 25  | not used      | not used    | not used    |

**Quad Port DS-1  
Interface**

The Quad Port DS-1 interface provides (4) RJ48C modular connectors. The pin assignments are listed below:

**Table B-6.    DACS II AX Interface Pin Assignments**

| Pin | Signal                 | To/From DACS II AX |
|-----|------------------------|--------------------|
| 1   | Receive (R1)           | To                 |
| 2   | Receive (T1)           | To                 |
| 3   | Not Used               | ----               |
| 4   | Transmit (R)           | From               |
| 5   | Transmit (T)           | From               |
| 6   | Not Used               | ----               |
| 7   | Optional Shield Ground | ----               |
| 8   | Optional Shield Ground | ----               |

**Quad OCU Data  
Port Interface**

The Quad OCU 56/64 Kbps DDS Data Port (DP) Interface uses an 8-pin modular jack in an RJ48S configuration. The table and figure that follow show the pin numbering and the pin assignments of the four DP jacks.

The following are the recommended cables:

- Dual purpose 8-position, 8-pin male/male modular cable (RJ48S configuration). Used for connecting the 56/64 Kbps QOCU port to the 56/64 Kbps DDS network interface. Cable is fifteen feet long.
- Eight-position, 8-pin male/male modular cable (RJ48S configuration with crossover wiring). Normally used for connecting the 58/64 Kbps QOCU Data Port to a 56/64 Kbps DDS port of a netAccess unit. Cable is fifteen feet long.

**Table B-7. QOCU 56/64 Kbps DDS Port (RJ48S)**

| Pin | Signal       | To/From<br>DACS II AX |
|-----|--------------|-----------------------|
| 1   | Transmit (R) | From                  |
| 2   | Transmit (T) | From                  |
| 3   | Not Used     | ----                  |
| 4   | Not Used     | ----                  |
| 5   | Not Used     | ----                  |
| 6   | Not Used     | ----                  |
| 7   | Receive (T1) | To                    |
| 8   | Receive (R1) | To                    |

**Octal T1/E1  
Interface**

The cable should use a 50-pin connector (AMP 229912-1 or equivalent) to mate with rear board. The cable should also be shielded and provide drain wire for connection of shield to rear bezel frame ground.

**Table B-8. Octal T1/E1**

| Pin | Link # | Signal         | To/From<br>DACS II AX |
|-----|--------|----------------|-----------------------|
| 26  | 1      | Transmit Tip   | From                  |
| 1   | 1      | Transmit Ring  | From                  |
| 27  | 1      | Receive Tip 1  | To                    |
| 2   | 1      | Receive Ring 1 | To                    |
| 29  | 2      | Transmit Tip   | From                  |
| 4   | 2      | Transmit Ring  | From                  |
| 30  | 2      | Receive Tip 1  | To                    |
| 5   | 2      | Receive Ring 1 | To                    |
| 32  | 3      | Transmit Tip   | From                  |
| 7   | 3      | Transmit Ring  | From                  |
| 33  | 3      | Receive Tip 1  | To                    |
| 8   | 3      | Receive Ring 1 | To                    |
| 35  | 4      | Transmit Tip   | From                  |
| 10  | 4      | Transmit Ring  | From                  |
| 36  | 4      | Receive Tip 1  | To                    |
| 11  | 4      | Receive Ring 1 | To                    |
| 38  | 5      | Transmit Tip   | From                  |
| 13  | 5      | Transmit Ring  | From                  |
| 39  | 5      | Receive Tip 1  | To                    |
| 14  | 5      | Receive Ring 1 | To                    |
| 41  | 6      | Transmit Tip   | From                  |
| 16  | 6      | Transmit Ring  | From                  |
| 42  | 6      | Receive Tip 1  | To                    |
| 17  | 6      | Receive Ring 1 | To                    |
| 44  | 7      | Transmit Tip   | From                  |
| 19  | 7      | Transmit Ring  | From                  |
| 45  | 7      | Receive Tip 1  | To                    |
| 20  | 7      | Receive Ring 1 | To                    |
| 47  | 8      | Transmit Tip   | From                  |
| 22  | 8      | Transmit Ring  | From                  |
| 48  | 8      | Receive Tip 1  | To                    |
| 23  | 8      | Receive Ring 1 | To                    |



**Octal Voice Rear  
Interface Cards -  
E&M, FXO, and  
FXS**

The cable should use a 50-pin connector (AMP 229912-1 or equivalent) to mate with rear board. The cable should also be shielded and provide drain wire for connection of shield to rear bezel frame ground.

**NOTE:**

Channels 1 through 6 are located on the P1 connector; channels 7 and 8 are located on the P2 connector.

**Table B-9. Octal Voice - E&M**

| Pin | Channel # | Signal         | To/From<br>DACS II AX |
|-----|-----------|----------------|-----------------------|
| 26  | 1         | Transmit Tip   | From                  |
| 1   | 1         | Transmit Ring  | From                  |
| 27  | 1         | Receive Tip 1  | To                    |
| 2   | 1         | Receive Ring 1 | To                    |
| 28  | 1         | E              | From                  |
| 3   | 1         | M              | From                  |
| 29  | 1         | SB             | From                  |
| 4   | 1         | SG             | From                  |
| 30  | 2         | Transmit Tip   | From                  |
| 5   | 2         | Transmit Ring  | From                  |
| 31  | 2         | Receive Tip 1  | To                    |
| 6   | 2         | Receive Ring 1 | To                    |
| 32  | 2         | E              | From                  |
| 7   | 2         | M              | From                  |
| 33  | 2         | SB             | From                  |
| 8   | 2         | SG             | From                  |
| 34  | 3         | Transmit Tip   | From                  |
| 9   | 3         | Transmit Ring  | From                  |
| 35  | 3         | Receive Tip 1  | To                    |
| 10  | 3         | Receive Ring 1 | To                    |
| 36  | 3         | E              | From                  |
| 11  | 3         | M              | From                  |
| 37  | 3         | SB             | From                  |
| 12  | 3         | SG             | From                  |
| 38  | 4         | Transmit Tip   | From                  |
| 13  | 4         | Transmit Ring  | From                  |
| 39  | 4         | Receive Tip 1  | To                    |
| 14  | 4         | Receive Ring 1 | To                    |
| 40  | 4         | E              | From                  |
| 15  | 4         | M              | From                  |
| 41  | 4         | SB             | From                  |

**Table B-9. Octal Voice - E&M (Continued)**

| Pin                 | Channel # | Signal         | To/From<br>DACS II AX |
|---------------------|-----------|----------------|-----------------------|
| 16                  | 4         | SG             | From                  |
| 42                  | 5         | Transmit Tip   | From                  |
| 17                  | 5         | Transmit Ring  | From                  |
| 43                  | 5         | Receive Tip 1  | To                    |
| 18                  | 5         | Receive Ring 1 | To                    |
| 44                  | 5         | E              | From                  |
| 19                  | 5         | M              | From                  |
| 45                  | 5         | SB             | From                  |
| 20                  | 5         | SG             | From                  |
| 46                  | 6         | Transmit Tip   | From                  |
| 21                  | 6         | Transmit Ring  | From                  |
| 47                  | 6         | Receive Tip 1  | To                    |
| 22                  | 6         | Receive Ring 1 | To                    |
| 48                  | 6         | E              | From                  |
| 23                  | 6         | M              | From                  |
| 49                  | 6         | SB             | From                  |
| 24                  | 6         | SG             | From                  |
| <b>P2 Connector</b> |           |                |                       |
| 26                  | 7         | Transmit Tip   | From                  |
| 1                   | 7         | Transmit Ring  | From                  |
| 27                  | 7         | Receive Tip 1  | To                    |
| 2                   | 7         | Receive Ring 1 | To                    |
| 28                  | 7         | E              | From                  |
| 3                   | 7         | M              | From                  |
| 29                  | 7         | SB             | From                  |
| 4                   | 7         | SG             | From                  |
| 30                  | 8         | Transmit Tip   | From                  |
| 5                   | 8         | Transmit Ring  | From                  |
| 31                  | 8         | Receive Tip 1  | To                    |
| 6                   | 8         | Receive Ring 1 | To                    |
| 32                  | 8         | E              | From                  |
| 7                   | 8         | M              | From                  |
| 33                  | 8         | SB             | From                  |
| 8                   | 8         | SG             | From                  |

**Table B-10. Octal Voice - FXO and FXS**

| Pin                        | Channel # | Signal | To/From<br>DACS II AX |
|----------------------------|-----------|--------|-----------------------|
| 26                         | 1         | Tip    | To/From               |
| 1                          | 1         | Ring   | To/From               |
|                            |           |        |                       |
| 29                         | 2         | Tip    | To/From               |
| 4                          | 2         | Ring   | To/From               |
|                            |           |        |                       |
| 32                         | 3         | Tip    | To/From               |
| 7                          | 3         | Ring   | To/From               |
|                            |           |        |                       |
| 35                         | 4         | Tip    | To/From               |
| 10                         | 4         | Ring   | To/From               |
|                            |           |        |                       |
| 38                         | 5         | Tip    | To/From               |
| 13                         | 5         | Ring   | To/From               |
|                            |           |        |                       |
| 41                         | 6         | Tip    | To/From               |
| 16                         | 6         | Ring   | To/From               |
| <b><i>P2 Connector</i></b> |           |        |                       |
| 44                         | 7         | Tip    | To/From               |
| 19                         | 7         | Ring   | To/From               |
|                            |           |        |                       |
| 47                         | 8         | Tip    | To/From               |
| 22                         | 8         | Ring   | To/From               |

## DB-25 to V.35 Cable Adapters (Optional)

For V.35 interface applications, you may need to use a DB-25 to V.35 cable adapter.

| Description               |
|---------------------------|
| Male V.35 to Male DB-25   |
| Male DB-25 to Female V.35 |

The pin assignments for the DB-25 to V.35 cable adapters are listed below:

**Table B-11. DB-25 to V.35 Cable Adapters**

| Signal        | Male DB-25 | Winchester V.35 |
|---------------|------------|-----------------|
| Shield        | 1          | A               |
| TXD in A      | 2          | P               |
| RXD out A     | 3          | R               |
| RTS in        | 4          | C               |
| CTS out       | 5          | D               |
| DSR out       | 6          | E               |
| Signal Ground | 7          | B               |
| DCD out       | 8          | F               |
| RXC out B     | 9          | X               |
| -             | 10         | -               |
| EXT CLK in B  | 11         | W               |
| TXC out B     | 12         | a*              |
| -             | 13         | -               |
| TXD in B      | 14         | S               |
| TXC out A     | 15         | Y               |
| RXD out B     | 16         | T               |
| RXC out A     | 17         | V               |
| -             | 18         | -               |
| -             | 19         | -               |

**Table B-11. DB-25 to V.35 Cable Adapters (Continued)**

| Signal       | Male DB-25 | Winchester V.35 |
|--------------|------------|-----------------|
| DTR in       | 20         | H               |
| -            | 21         | -               |
| -            | 22         | -               |
| -            | 23         | -               |
| EXT CLK in A | 24         | U               |
| -            | 25         | -               |

*\*On AMP connectors, this pin is designated as "AA".*

## Octal High Speed Cables

| Description                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EIA-232-M/M Straight-through Cable.</b> This 15-ft. DB-26 (male) to DB-25 (male) cable assembly is used in conjunction with the OHSD Interface Module for EIA-232 (ISO-2110) DCE-to-DCE applications.              |
| <b>EIA-530-M/M Straight-through Cable.</b> This 15-ft. DB-26 (male) to DB-25 (male) cable assembly is used in conjunction with the OHSD Interface Module for EIA-530 (ISO-2110) DCE-to-DTE applications.              |
| <b>EIA-530-M/M Cross-over Cable.</b> This 15 ft. DB-26 (male) to DB-25 (male) cable assembly is used in conjunction with the OHSD Interface Module for EIA-530 (ISO-2110) DCE-to-DCE applications.                    |
| <b>EIA-530-A M/M Straight-through Cable.</b> This 15 ft. DB-26 (male) to DB-25 (male) cable assembly is used in conjunction with the OHSD Interface Module for EIA-530-A (ISO-2110) DCE-to-DTE applications.          |
| <b>EIA-530-A M/M Cross-over Cable.</b> This 15 ft. DB-26 (male) to DB-25 (male) cable assembly is used in conjunction with the OHSD Interface Module for EIA-530-A (ISO-2110) DCE-to-DCE applications.                |
| <b>EIA-422 M/M Straight-through Cable.</b> This 15 ft. DB-26 (male) to DB-37 (male) cable assembly is used in conjunction with the OHSD Interface Module for EIA-422 (EIA-449 & ISO-4902) DCE-to-DTE applications.    |
| <b>ITU-V.35 M/M Straight-through Cable.</b> This 15 ft. DB-26 (male) to M-34 (male) cable assembly is used in conjunction with the OHSD Interface Module for ITU-V.35 (ISO-2593) DCE-to-DTE applications.             |
| <b>ITU-V.35 M/M Cross-over Cable.</b> This 15 ft. DB-26 (male) to M-34 (male) cable assembly is used in conjunction with the OHSD Interface Module for ITU-V.35 (ISO-2593) DCE-to-DCE applications.                   |
| <b>ITU-X.21 M/M Straight-through Cable.</b> This 15 ft. DB-26 (male) to DB-15 (male) cable assembly is used in conjunction with the OHSD Interface Module for ITU-X.21 (ITU-X.27 & ISO-4903) DCE-to-DTE applications. |

**Octal High Speed  
Cable Adapter Pin-  
outs.****Table B-12. EIA-232 M/M Straight-through Cable**

| PIN<br>(from 26-pin male) | SIGNAL     | PIN<br>(to 25-pin male) |
|---------------------------|------------|-------------------------|
| 4                         | RTS        | 4                       |
| 5                         | CTS        | 5                       |
| 6                         | DSR        | 6                       |
| 20                        | DTR        | 20                      |
| 8                         | DCD        | 8                       |
| 9                         | TXD        | 2                       |
| 11                        | RXD        | 3                       |
| 13                        | TT         | 24                      |
| 22                        | TXC        | 15                      |
| 24                        | RXC        | 17                      |
| 7                         | SIGNAL GND | 7                       |
| 1                         | SHIELD     | 1                       |

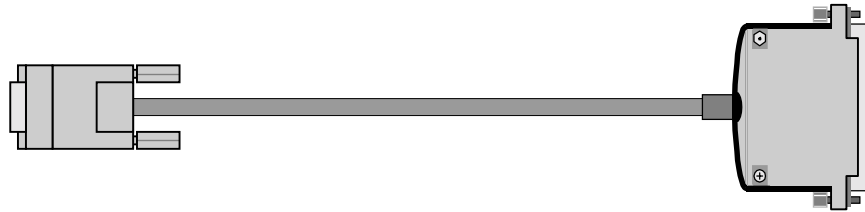
**Table B-13. EIA-530 M/M Straight-through Cable.**

| PIN<br>(from 26-pin male) | SIGNAL                                          | PIN<br>(to 25-pin male) |
|---------------------------|-------------------------------------------------|-------------------------|
| 4                         | RTS (A)                                         | 4                       |
| 3                         | RTS (B)                                         | 19                      |
| 5                         | CTS (A)                                         | 5                       |
| 2                         | CTS (B)                                         | 13                      |
| 6                         | DCE READY (A)                                   | 6                       |
| 14                        | DCE READY (B)                                   | 22                      |
| 20                        | DTE READY CD (A)                                | 20                      |
| 15                        | DTE READY CD (B)                                | 23                      |
| 8                         | RX LINE SIGNAL DETECTOR<br>DD (A)               | 8                       |
| 16                        | RX LINE SIGNAL DETECTOR<br>DD (B)               | 10                      |
| 9                         | TRANSMITTED DATA BA (A)                         | 2                       |
| 10                        | TRANSMITTED DATA BA (B)                         | 14                      |
| 11                        | RECEIVED DATA BB (A)                            | 3                       |
| 12                        | RECEIVED DATA BB (B)                            | 16                      |
| 13                        | TX SIGNAL ELEMENT TIMING<br>(DTE SOURCE) DA (A) | 24                      |
| 26                        | TX SIGNAL ELEMENT TIMING<br>(DTE SOURCE) DA (B) | 11                      |
| 22                        | TX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DB (A) | 15                      |
| 23                        | TX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DB (B) | 12                      |
| 24                        | RX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DD (A) | 17                      |
| 25                        | RX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DD (B) | 9                       |
| 7                         | SIGNAL GND AB                                   | 7                       |
| 1                         | SHIELD                                          | 1                       |



**Table B-14. EIA-530-A M/M Straight-through Cable**

| PIN<br>(from 26-pin male) | SIGNAL                                          | PIN<br>(to 25-pin male) |
|---------------------------|-------------------------------------------------|-------------------------|
| 4                         | RTS CA (A)                                      | 4                       |
| 3                         | RTS CA (B)                                      | 19                      |
| 5                         | CTS CB (A)                                      | 5                       |
| 2                         | CTS CB (B)                                      | 13                      |
| 6                         | DCE READY CC                                    | 6                       |
| 20                        | DTE READY CD                                    | 20                      |
| 8                         | RX LINE SIGNAL DETECTOR<br>DD (A)               | 8                       |
| 16                        | RX LINE SIGNAL DETECTOR<br>DD (B)               | 10                      |
| 9                         | TXD BA (A)                                      | 2                       |
| 10                        | TXD DATA BA (B)                                 | 14                      |
| 11                        | RX DATA BB (A)                                  | 3                       |
| 12                        | RX DATA BB (B)                                  | 16                      |
| 13                        | TX SIGNAL ELEMENT TIMING<br>(DTE SOURCE) DA (A) | 24                      |
| 26                        | TX SIGNAL ELEMENT TIMING<br>(DTE SOURCE) DA (B) | 11                      |
| 22                        | TX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DA (A) | 15                      |
| 23                        | TX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DA (B) | 12                      |
| 24                        | RX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DB (A) | 17                      |
| 25                        | RX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) DB (B) | 9                       |
| 7                         | SIGNAL GND AB                                   | 7                       |
| 21                        | SIGNAL COMMON AC                                | 23                      |
| 1                         | SHIELD                                          | 1                       |

**Table B-15. EIA-422 M/M Straight-through Cable**

| PIN<br>(from 26-pin male) | SIGNAL              | PIN<br>(to 37-pin male) |
|---------------------------|---------------------|-------------------------|
| 4                         | RTS (A)             | 7                       |
| 3                         | RTS (B)             | 25                      |
| 5                         | CTS (A)             | 9                       |
| 2                         | CTS (B)             | 27                      |
| 6                         | DATA MODE (A)       | 11                      |
| 14                        | DATA MODE (B)       | 29                      |
| 20                        | TERMINAL READY (A)  | 12                      |
| 15                        | TERMINAL READY (B)  | 30                      |
| 8                         | RECEIVER READY (A)  | 13                      |
| 16                        | RECEIVER READY (B)  | 31                      |
| 9                         | SEND DATA (A)       | 4                       |
| 10                        | SEND DATA (B)       | 22                      |
| 11                        | RECEIVED DATA (A)   | 6                       |
| 12                        | RECEIVED DATA (B)   | 24                      |
| 13                        | TERMINAL TIMING (A) | 17                      |
| 26                        | TERMINAL TIMING (B) | 35                      |
| 22                        | SEND TIMING (A)     | 5                       |
| 23                        | SEND TIMING (B)     | 23                      |
| 24                        | RECEIVE TIMING (A)  | 8                       |
| 25                        | RECEIVE TIMING (B)  | 26                      |
| 7                         | SIGNAL GND          | 19                      |
| 21                        | RECEIVE COMMON      | 20                      |
| 1                         | SHIELD              | 1                       |

**Table B-16. ITU-V.35 M/M Straight-through Cable**

| PIN<br>(from 26-pin male) | SIGNAL                                           | PIN<br>(to 34-pin male) |
|---------------------------|--------------------------------------------------|-------------------------|
| 4                         | RTS 105                                          | C                       |
| 5                         | CTS 106                                          | D                       |
| 6                         | DSR 107                                          | E                       |
| 20                        | DTR 108                                          | H                       |
| 8                         | RECEIVED LINE SIGNAL<br>DETECTOR 109             | F                       |
| 9                         | TXD 103 (A)                                      | P                       |
| 10                        | TXD 103 (B)                                      | S                       |
| 11                        | RXD 104 (A)                                      | R                       |
| 12                        | RXD 104 (B)                                      | T                       |
| 13                        | TX SIGNAL ELEMENT TIMING<br>(DTE SOURCE) 113 (A) | U                       |
| 26                        | TX SIGNAL ELEMENT TIMING<br>(DTE SOURCE) 113 (B) | W                       |
| 22                        | TX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) 114 (A) | Y                       |
| 23                        | TX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) 114 (B) | AA                      |
| 24                        | RX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) 115 (A) | V                       |
| 25                        | RX SIGNAL ELEMENT TIMING<br>(DCE SOURCE) 115 (B) | X                       |
| 7                         | SIGNAL GND 102                                   | B                       |
| 1                         | SHIELD                                           | A                       |

**Table B-17. ITU-X.21 M/M Straight-through Cable**

| PIN<br>(from 26-pin male) | SIGNAL                         | PIN<br>(to 15-pin male) |
|---------------------------|--------------------------------|-------------------------|
| 4                         | CONTROL C (A)                  | 3                       |
| 3                         | CONTROL C (B)                  | 10                      |
| 5                         | INDICATION I (A)               | 5                       |
| 2                         | INDICATION I (B)               | 12                      |
| 9                         | TRANSMIT T (A)                 | 2                       |
| 10                        | TRANSMIT T (B)                 | 9                       |
| 11                        | RECEIVE R (A)                  | 4                       |
| 12                        | RECEIVE R (B)                  | 11                      |
| 22                        | SIGNAL ELEMENT<br>TIMING S (A) | 6                       |
| 23                        | SIGNAL ELEMENT<br>TIMING S (B) | 13                      |
| 7                         | SIGNAL GND G                   | 8                       |
| 1                         | SHIELD                         | 1                       |

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## Cables for Redundancy

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### **Cable for DS3 or STS-1 Redundancy**

**Cable for DS3 Redundancy:** The coaxial straight-through cable is a 1.5 foot coaxial male to male 75 ohm cable assembly used in conjunction with the N+1 Broad Band Redundant module for connection to the redundant DS3. The same cable is used for STS1 redundancy.



**Cable for Octal T1/  
E1 Redundancy**

The 16" 50-pin M cat3 cable provides the connection between the Narrow Band Redundant card and the redundant Octal T1/E1 card.

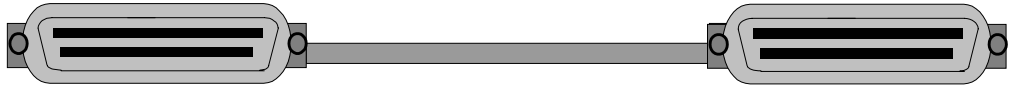


**Table B-18. 50-Pin M to 50-Pin M cat3 Cable for Octal T1/E1 Redundancy**

| PIN<br>(from 50-pin male) | SIGNAL        | PIN<br>(to 50-pin male) | PAIRS | LINKS |
|---------------------------|---------------|-------------------------|-------|-------|
| 26                        | TRANSMIT TIP  | 26                      | 1     | 1     |
| 1                         | TRANSMIT RING | 1                       | 1     | 1     |
| 27                        | RECEIVE TIP   | 27                      | 2     | 1     |
| 2                         | RECEIVE RING  | 2                       | 2     | 1     |
| 28                        | UNUSED        | 28                      | 3     | --    |
| 3                         | UNUSED        | 3                       | 3     | --    |
| 29                        | TRANSMIT TIP  | 29                      | 4     | 2     |
| 4                         | TRANSMIT RING | 4                       | 4     | 2     |
| 30                        | RECEIVE TIP   | 30                      | 5     | 2     |
| 5                         | RECEIVE RING  | 5                       | 5     | 2     |
| 31                        | UNUSED        | 31                      | 6     | --    |
| 6                         | UNUSED        | 6                       | 6     | --    |
| 32                        | TRANSMIT TIP  | 32                      | 7     | 3     |
| 7                         | TRANSMIT RING | 7                       | 7     | 3     |
| 33                        | RECEIVE TIP   | 33                      | 8     | 3     |
| 8                         | RECEIVE RING  | 8                       | 8     | 3     |
| 34                        | UNUSED        | 34                      | 9     | --    |
| 9                         | UNUSED        | 9                       | 9     | --    |
| 35                        | TRANSMIT TIP  | 35                      | 10    | 4     |
| 10                        | TRANSMIT RING | 10                      | 10    | 4     |
| 36                        | RECEIVE TIP   | 36                      | 11    | 4     |
| 11                        | RECEIVE RING  | 11                      | 11    | 4     |
| 37                        | UNUSED        | 37                      | 12    | --    |
| 12                        | UNUSED        | 12                      | 12    | --    |
| 38                        | TRANSMIT TIP  | 38                      | 13    | 5     |
| 13                        | TRANSMIT RING | 13                      | 13    | 5     |
| 39                        | RECEIVE TIP   | 39                      | 14    | 5     |

**Table B-18. 50-Pin M to 50-Pin M cat3 Cable for Octal T1/E1 Redundancy**

|    |               |    |    |    |
|----|---------------|----|----|----|
| 14 | RECEIVE RING  | 14 | 14 | 5  |
| 40 | UNUSED        | 40 | 15 | -- |
| 15 | UNUSED        | 15 | 15 | -- |
| 41 | TRANSMIT TIP  | 41 | 16 | 6  |
| 16 | TRANSMIT RING | 16 | 16 | 6  |
| 42 | RECEIVE TIP   | 42 | 17 | 6  |
| 17 | RECEIVE RING  | 17 | 17 | 6  |
| 43 | UNUSED        | 43 | 18 | -- |
| 18 | UNUSED        | 18 | 18 | -- |
| 44 | TRANSMIT TIP  | 44 | 19 | 7  |
| 19 | TRANSMIT RING | 19 | 19 | 7  |
| 45 | RECEIVE TIP   | 45 | 20 | 7  |
| 20 | RECEIVE RING  | 20 | 20 | 7  |
| 46 | UNUSED        | 46 | 21 | -- |
| 21 | UNUSED        | 21 | 21 | -- |
| 47 | TRANSMIT TIP  | 47 | 22 | 8  |
| 22 | TRANSMIT RING | 22 | 22 | 8  |
| 48 | RECEIVE TIP   | 48 | 23 | 8  |
| 23 | RECEIVE RING  | 23 | 23 | 8  |
| 49 | UNUSED        | 49 | 24 | -- |
| 24 | UNUSED        | 24 | 24 | -- |
| 50 | UNUSED        | 50 | 25 | -- |
| 25 | UNUSED        | 25 | 25 | -- |

**Cable for N+1  
Protection Switch**

The DB9M-DB9M Straight-Through Cable is a 1.5 foot DB-9 male to DB-9 male cable assembly used in conjunction with the N+1 Controller module for connection to the DACS II AX-11.

**Table B-19. DB9 TO DB9 Straight-through Cable for N + 1 Protection Switch**

| PIN<br>(from male) | SIGNAL         | PIN<br>(to male) | SIGNAL                              |
|--------------------|----------------|------------------|-------------------------------------|
| 2                  | TX DATA        | 2                | RX DATA                             |
| 3                  | RX DATA        | 3                | TX DATA                             |
| 4                  | OPTO ANODE     | 4                | PRESENT SIGNAL'S POSITIVE POTENTIAL |
| 6                  | OPTO CATHODE   | 6                | PRESENT SIGNAL'S NEGATIVE POTENTIAL |
| 1                  | POSITIVE LEVEL | 1                | HARD RESET LINE, PS OPTO ANODE      |
| 7                  | NEGATIVE LEVEL | 7                | HARD RESET LINE, PS OPTO CATHODE    |
| 5                  | LOGIC GROUND   | 5                | LOGIC GROUND                        |
| 8                  | SPARE 1        | 8                | SPARE 1                             |
| 9                  | SPARE 2        | 9                | SPARE 2                             |



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## Installation and Upgrade Procedures

# C

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## Overview

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These procedures will help secure network integrity and minimize disruptive anomalies to narrowband and broadband applications:

- Slot Reconfiguration and Mapping Strategies
- Application Module Upgrades and Procedures
- System Management Controller II step-by-step hardware upgrades and procedures
- Protection Switch (PSX) installation and verification
- Circuit Migration
- Configuring the Protection Switch and Redundancy Modules

Complete procedures are included in the *DACS II AX Release 9.02 Software Release Description*. The software release description is on the CD-ROM with the DACS II AX software.

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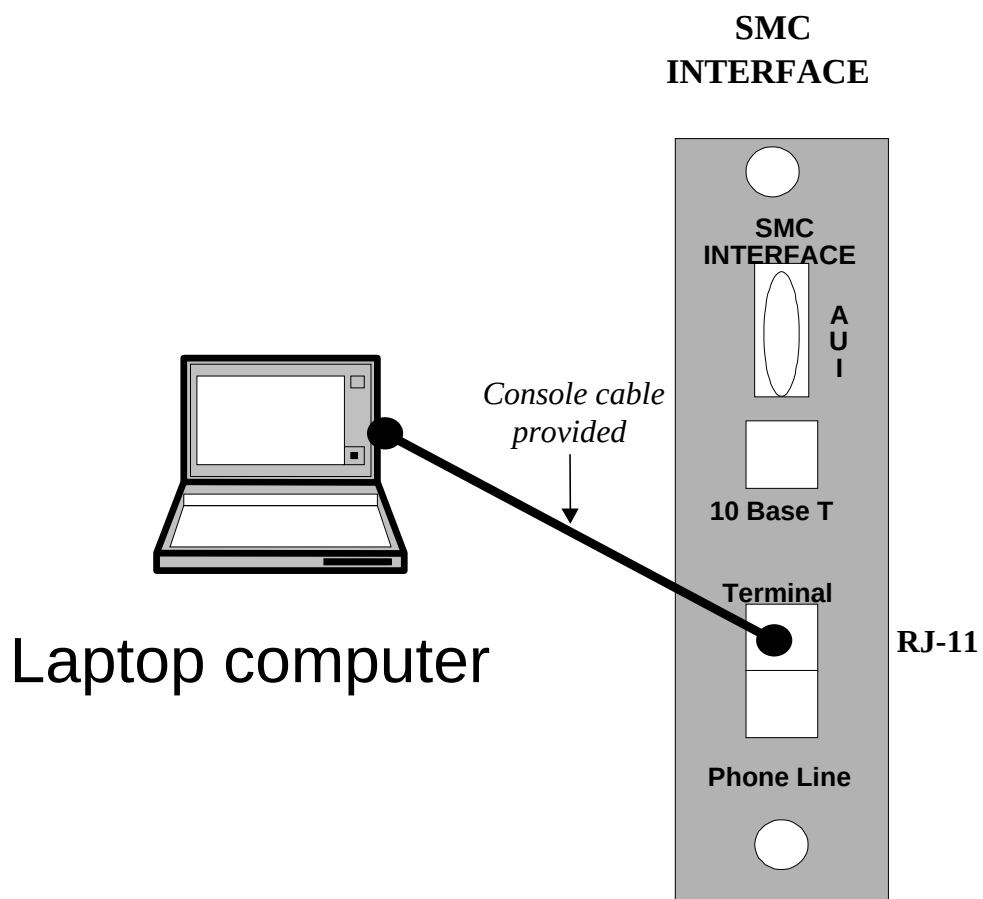


**Figure C-1. Console Connection**

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## Console Connection

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### Connection

For new installations of the DACS II AX, connect a PC or laptop with VT-100 emulation or an asynchronous terminal or to the RJ-11 craft interface connector labeled TERM on the rear interface of the SMC (Figure C-1).

Configure terminal communication parameters. These are listed in Chapter 2.

---

### Initial Setup

From this connection, you can access the DACS II AX menus and perform many of the administration tasks necessary to set up the system.

It is important to complete the following tasks using the console connection:

- If there will be more than one user of the DACS II AX, set up user accounts. The first user account must have a security level of Administrator. For more details, see Chapter 4.
- Enter the DACS II AX IP address. The DACS II AX IP address is needed for two reasons:
  - telnet access
  - use of TFTP to download software upgrades to the application modules and to the SMC

To enter the DACS II AX IP address, from the Main Menu, select System Configuration, then select Port IP Addresses. For more details, see Chapter 4.

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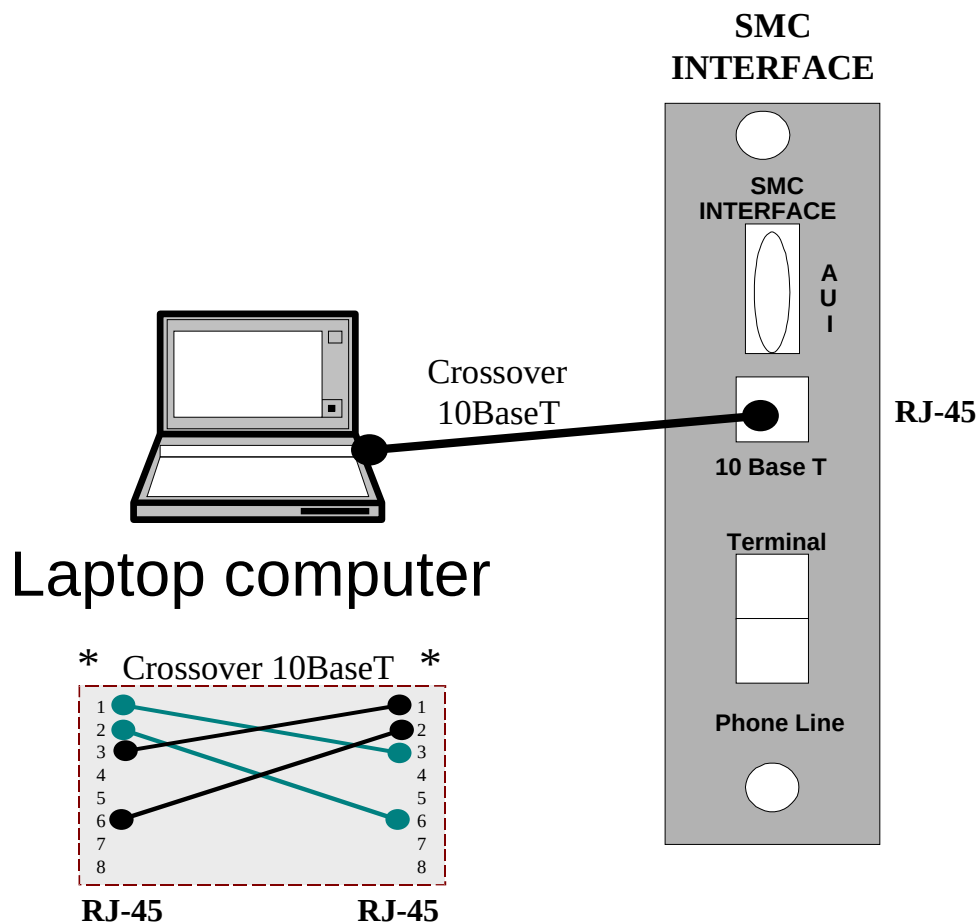


**Figure C-2. Direct Ethernet Connection**

## **Direct Ethernet Connection**

---

### **Before you begin**

The IP address of the DACS II AX must have been entered on the Port IP Addresses Menu using a local terminal.

---

### **Setup**

Connect the laptop to the DACS II AX using a 10BaseT crossover cable (Figure C-2) so that you can download DACS II AX software upgrades that are on the PC to the DACS II AX using TFTP.

Software can also be downloaded remotely through a routed LAN environment.

Establish a telnet session to connect to the DACS II AX.

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## Application Module Upgrade

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Software Upgrades to the DACS II AX can be achieved quickly and easily through the use of TFTP (Trivial File Transfer Protocol).

Ideally the TFTP software code transfer should be performed local through the LAN connection but can be completed remotely through a routed LAN environment.

Copy the software upgrade files to the Host PC which will be running the TFTP Client application.

The DACS II AX will recognize the transfer and automatically become the TFTP Server.

---

### Starting TFTP

Start the TFTP Client application on the Host PC.

There are different styles of TFTP applications. For the purpose of this document, general terms are used when describing TFTP entries.

Type in the DACS II AX IP address for the destination, host, or target node location.

Enter the Host PC path to the selected upgrade code either by typing it in or by clicking on the "send" button and locating the file.

DO NOT alter the file name. The remote path can, but does not have to match the local path.

If there are redundant SMC modules, verify that the configuration databases are InSync by logging into the DACS II AX and looking at the top left corner of the Main Menu.

---

### Application Module Upgrade

**NOTE:**

N+1 Redundancy must be disabled prior to upgrading application modules.

TFTP the application module software upgrade of choice to the SMC IP address.

Log into the DACS II AX and from the Main Menu select "Utilities".

Under the Utilities Menu, select "Download Devices Software".



Verify at the top of the page that the "Current Program file:" is equal to the software file that you just transferred.

Position the cursor on the slot to be upgraded and press the **L** key or press the **A** key to upgrade all modules of that software type.

At completion of the last application module(s) upgrade, press the **D** key to delete the program file out of SMC RAM freeing up that resource space.

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**Additional  
Application  
Module Upgrade**

Repeat Application Module Upgrade procedure.

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## Slot Reconfiguration and Mapping Strategies

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In the DACS II AX chassis Slot 1 must be used for your narrow band redundancy module (i.e. - the backup Octal T1/E1 Application and Interface Modules), while Slot 11 will be used for your broadband redundancy (i.e. - the backup DS-3 Application and Interface Modules). The N+1 PSX is a VDC -48 powered switch, that can protect up to ten (10) Octal T1/E1 Modules located in Slots 2 through 11 or up to three (3) DS3 or (3) STS! Modules located in Slots 8 through 10. After accessing your DACS II AX slot utilization and cross-connect map to determine if any modules or cross-connects exist in Slot 1 or Slot 11, continue at step 1.

1. If no network traffic or modules exists in the aforementioned slots proceed to module Upgrades and Procedures. If however you need to migrate traffic and/or modules continue at step 2.
  2. First log into your DACS II AX system and proceed to the Connection Maps Manager. At the next submenu go to Map Configuration. You should now use the tag and copy features in this menu, by tagging an unused non-active map and copy the active one to it. After this process you are ready to go into the recently tagged map and make your cross-connect changes, since this is an offline map your changes will be non-disruptive. When you are finished, verify your hardware options are properly configured for the new map cross-connects and that the appropriate modules are in the proper slots. After finishing this procedure, reconfirm the changes you have made and activate this newly configured map. This should ensure minimal disruption to your users. You are now ready to proceed to the next section.
-

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## System Management Controller Upgrade

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### Removing SMC Rear Interface Guide

To remove the rear interface guide, you must first remove the rear SMC I interface module and the blank bezel. You will now be able to view the guide. Carefully hold the guide with one hand while removing the 2 screws to the right of the guide. Once the screws are removed carefully slide the guide from the chassis.

**\*CAUTION\* DACS II AX is fully powered up at this time.** You are now ready to insert the new SMC II rear interface into the newly created full height slot. After installation proceed to the next step.

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### SMC II Installation

Remove the Standby SMC I and insert the new SMC II into the standby slot. At this time log into the DACS II AX and proceed to the Utilities menu. At the submenu choose "Copy File System" and wait till the process is complete. After completion, go back to the main menu and verify the Databases are "Insync". If databases are not insync repeat process. If databases are insync, remove the online SMC I to force a switchover to the new SMC II. Now insert the redundant SMC II into the primary slot. After the SMC II completes self test and is in standby mode, log back into the DACS II AX and repeat above process. Once process has completed verify databases are insync. If databases are not insync repeat process. If databases are insync upgrade is complete. Proceed to next section.

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## Protection Switch (PSX) Installation

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**Mounting the PSX**      Mount the PSX directly on the top of the DACS II AX. Make sure unit is flush and even. Tighten securely with the rack mount screws supplied. Attach the DB9 to DB9 controller cable supplied from the rear SMC II interface module to the PSX controller and secure. You are now ready to connect your power cables from the PSX to your DC power supply. (It is recommended that you use separate sources for redundancy)

After completion proceed to next section.

---

**Powering up and  
Verifying the PSX**

Insert fuses in your DC power supply and log into the DACS II AX.

Proceed to the "Node Summary" menu.

Move down to "PSX" Switch Box and verify that it is online. If PSX is not online verify all cabling and power connections until unit is online. Once online, enter the PSX submenu and go into the Status menu. Verify that all modules and power supplies are 'OK" in the card status field. If card status for all modules and power supplies is OK, proceed to next section.

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## Cable and Circuit Migration to PSX

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### Attaching Cables from PSX to Redundant DACS II AX Modules

Connect supplied cables (coax BNC for DS3 or 50 pin Telco pigtails for Octal T1/E1) in slots 1 and/or 11 from the DACS II AX to the PSX. After complete proceed to next section.

### Attaching live cables from PSX to Online Modules

**NOTE:**

This will have a short but disruptive impact on users! This may need to be done after hours or at a prearranged down time! \*

This process will proceed quickly and easily. Remove the 50 pin connector from the Octal T1/E1 or the BNC connector from the DS3 module and connect it to the PSX. Then as outlined in the previous section, connect the supplied cables from the PSX to the DACS II AX. Verify circuit and users are back online, then proceed to the next module requiring redundancy. After all connections have been made and verified, proceed to the next section.

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## Configuring the PSX and DACS II AX for Redundancy

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### Configuring the DACS II AX Redundant slots:

1. Log into the DACS II AX.
2. From the main menu select Node Summary.
3. At the Node Summary menu press the **S** key on the keyboard to enter the "Slot Configuration" menu.
4. Verify "N+1 Redundancy" is disabled. Then verify that "N+1 Redundancy Switchover" is in the manual position.
5. Now go to the slots requiring redundancy and enter the submenu. At the submenu go to the "Redundancy" field and set for Enable. ( \*Note: this must also be done for slots 1 and 11 if they are being used for the redundant modules\*) After completing this for all slots requiring redundant backup, go back to the "Node Summary" menu and proceed to "N+1 Redundancy" and set for "Enable".
6. Verify redundant modules are ready by observing the "GREEN" blinking Ready LED. Then proceed to verify each online module with it's "GREEN" Ready LED in the on state.
7. At this point if Automatic Redundancy is desired, go back into the "Slot Configuration" menu and go to "N+1 Redundancy Switchover" to set for Automatic.

The upgrade is now complete.

---

### A

**AC** - Alternating Current. The common form of electricity from power plant to home/office. Its direction is reversed 60 times per second in the U.S.; 50 times in Europe.

**AMI** - Alternate Mark Inversion. A line encoding scheme for transmitting data bits over T1 transmission systems.

**ANI** - Automatic Number Identification. A feature in which a series of digits, either analog or digital, are included in the call, thus identifying the telephone number of the caller.

**ANSI** - American National Standards Institute. This organization organizes committees, made up of computer users, manufacturers etc., to develop and publish industry standards.

**ASCII** - American Standard Code for Information Interchange. An asynchronous signaling code with character framing. An ASCII character consists of a start bit, seven data bits, a parity bit (even if unused) and a stop bit. In some cases, 1-1/2 or 2 stop bits are used. Thus ASCII is at best 70% efficient with seven data bits out of every ten-bit character. Note that 1-1/2 stop bits can not be used if the data will be carried by modern-day modems. The parity bit is used as an eighth data bit with able characters from 128 to 256. ASCII data can also be transported synchronously (clocked async).

**Asynchronous transmission** - Digital signals are transmitted without precise clocking. The signals have different frequencies and phase relationships. Individual characters contained in control bits (start and stop bits) designate the beginning and end of each character.

**ATM** - Asynchronous Transfer Mode. A component of ISDN. A switching technology that organizes digital data in 53 byte packets and transmits them using digital signal technology.

**AUI** - Attachment Unit Interface. A 15-pin connector and cable used to connect a network interface card and an Ethernet network.

**Authentication** - The process of attempting to ensure that the person using the computer system and performing tasks such as sending or receiving messages is one and the same as the person in whose name the account is registered. Networks require passwords as a means of authentication; however, passwords do not guarantee that the person using the system is the person to whom the password was given.

**AWG** - American Wiring Gauge. A U.S. measurement standard of the diameter of non-ferrous wire, which includes copper and aluminum. The smaller the number, the thicker the wire. In general, the thicker the wire, the greater the current-carrying capacity and the longer the distance it can span.

## B

**B8ZS** - Binary with 8 Zero Substitution. Line code type, used on T1 and E1 circuits, in which a special code is substituted whenever eight consecutive zeros are sent over the link. Code is then interpreted at the remote end of the connection.

**BER** - Bit Error Rate. Ratio of received bits that contain errors.

**Bipolar Violations** - Violations of the electrical characteristic denoting a circuit with both negative and positive polarity.

**BERT** - Bit Error Rate Tester. A device that calculates the bit error rate on a communication channel.

**bps** - Bits per second. The speed at which a point-to-point transmission line can convey data.

**Broadband Application Module** - This card resides in the DACS II AX and can be protected by the N+1 Protection Switch. The DACS II AX supports three types of broadband application modules: DS-3, hybrid DS-3, and STS-1. Only one type of broadband module can be protected by the N+1 Protection Switch.



**Broadband Primary Card** - this card resides in the N+1 Protection Switch and is used to back up a broadband application module in slot 8, 9 or 10.

**Broadband Redundant Card** - this card resides in the N+1 Protection Switch and is used to back up a broadband application module; it must reside in slot 11.

## C

**CHAP** - Challenge Handshake Authentication Protocol. A type of authentication protocol in which the authentication agent sends the client program a key to be used to encrypt the user name and password. CHAP doesn't only require the client to authenticate itself at startup time, but sends challenges at regular intervals to make sure the client hasn't been replaced by an intruder, for instance by switching phone lines. Also see PAP.

**CLEC** - Competitive Local Exchange Carrier. A company that creates and operates communication networks and provides customers with an alternative to the local telephone company.

**CMOS** - Complementary Metal Oxide Semiconductor. Technology employing integrated field-effect transistors in a complementary symmetry arrangement, which simulates "Push/Pull" operation because of the placement of opposing-polarity devices (p-channel and n-channel FETs).

**CODEC** - enCOder/DECOder. Chip used in the voice card to compress or decompress speech or audio signals.

**Controller Card** - provides communications between the DACS II AX's System Manager and the N+1 Protection Switch.

**CPE** - Customer Premises Equipment. Equipment, such as terminals and modems, supplied by the telephone company, that is installed at customer sites and connected to the telephone company network.

**CRC** - Cyclic Redundancy Check. A method of checking for errors in data that has been transmitted on a communications link. The dividend polynomial is initially preset to 0, and the 1s and 0s of the data stream become the coefficients of the dividend polynomial. The division uses subtraction modulo 2 (no carries), and the remainder is transmitted as the error check field. The receiving station compares the transmitted remainder with its own computed remainder, and an equal condition indicates that no error has occurred. The polynomial value depends on the protocol and code set being used.

**CSU** - Channel Service Unit. A device used to connect a digital phone line coming in from the phone company to network access equipment located on the customer premises. CSU may also be built into the network interface of the network access equipment.

**D**

**D4** - Super Frame. A common framing type used on T1 circuits. It consists of twelve frames of 192 bits each, with the 193rd bit providing error checking and other functions. It is superseded by ESF but still widely used.

**DAC** - Digital to Analog Converter. A device for converting digital signals into continuous analog signals. The converter usually buffers the input so that the output remains the same until the input changes. A typical converter provides two analog output channels ranging from 0 to +10 volts with eight bits per channel resolution; also provides two logic level outputs for external device control.

**DB Connector** - A family of plugs and sockets widely used in communications and computer devices. DB connectors come in 9, 15, 25, 37 and 50-pin sizes. The DB connector defines the physical structure of the connector, not the purpose of each line.

**DC** - Direct Current. An electrical current that travels in one direction and used within the computer's electronic circuits.

**DCE** - Data Circuit-Terminating Equipment. Device and connections of a communications network that comprise the network end of the user-to-network interface. It provides physical connection to the network, forwards traffic and provides clocking signals used to synchronize data transmission between DTE devices and itself.

**DCS** - Digital Cross-Connect System. A network element providing automatic cross-connection of a digital signal or its constituent.

**DDS** - Dataphone Digital Service (previously Digital Data Service). A digital network service available from AT&T, the Bell Operating Companies and independent telephone companies. Non-switched synchronous data rates of 2400, 4800, 9600 and 56,000 bps and switched synchronous 56,000 bps are available.

**DNS** - Domain Name System. The manner in which the Internet locates and translates domain names into IP addresses.

**DS0** - Digital Signal Level 0. The base for the digital signal X series; transmits digital signals over a single channel at 64 Kbps.

**DS1** - Digital Signal Level 1. Framing specification used in transmitting digital signals at 1.544-Mbps on a T1 facility (United States) or at 2.108-Mbps on an E1 facility (Europe).

**DS3** - Digital Signal Level 3. Framing specification used in transmitting digital signals at 44.736-Mbps on a T3 facility (United States) or at 34.368-Mbps on an E3 facility (Europe).

**DSL** - Digital Subscriber Line. Technology that brings high-bandwidth information to homes and small business over copper telephone lines. It can carry both data and voice signals.

**DSU** - Data Service Unit. A device used in digital transmission that adapts a physical interface on a DTE device to a transmission facility such as T1 or E1. It is also responsible for functions such as timing.

**DTE** - Data Terminal Equipment. A device at the user end of a user-network interface that serves as a data source, destination, or both. It connects to a data network through a DCE device (such as a modem) and typically uses clocking signals generated by the DCE. It includes devices such as computers, protocol translators and multiplexers.

**DTMF** - Dual Tone Multi Frequency. The signal a telephone company receives when a telephone's touch keys are pressed. Also known as Touchtone.

## E

**E1** - A digital transmission link with a capacity of 2.048 Mbps, used predominantly in Europe. E1 is channelized into 32 DS0s, each capable of carrying a single voice conversation or data stream.

**EIA** - Electronic Industries Association. A membership organization that sets standards for consumer products and electronic components.

**E&M** - Receive and Transmit. A trunking arrangement used for two-way switch-to-switch or switch-to-network connections. It is used with E1 and T1 interfaces.

**ESF** - Extended Superframe. A framing format for T1 applications that consists of twenty four frames of 192 bits each with the 193rd bit providing timing and other functions. It includes provisions for continuous monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

**Ethernet** - The most widely-used standard for local area networks (LANs).

## F

**FCC** - Federal Communications Commission. United States government agency that supervises, licenses and controls electronic and electromagnetic transmission standards.

**FPGA** - Field Programmable Gate Array. A programmable logic chip in a high density of gates. There are a variety of FPGA architectures including programmable logic blocks, programmable interconnects and switches between the blocks.

**Frame** - At the data link layer in a point-to-point transmission line, the technique used to demarcate the data so that it can be received in an orderly and meaningful way.

**Frame Relay** - At the data link layer in a wide area network (WAN), a protocol for transferring packets at speeds up to 1.544 Mbps, depending on the physical medium being used. Frame Relay is designed for noise-free digital lines, and therefore omits the error correction facilities. The result is increased bandwidth.

**FTP** - File Transfer Protocol. Application protocol used for transferring files between network nodes.

**FXO** - Foreign Exchange Office. An interface that connects to the Public Switched Telephone Network's (PSTN) central office and is the interface offered on a standard telephone. Example: RJ-11 connector that allows analog connection to the central office.

**FXS** - Foreign Exchange Subscriber. An interface that connects directly to a standard telephone and supplies ring, voltage, and dial tone. Example: RJ-11 connector allows connections to basic telephone equipment.

## H

**HDLC** - High-Level Data Link Control. An ISO communications protocol used in X.25 packet switching networks. It provides error correction at the data link layer.

**HDSL** - High-bit rate Digital Subscriber Line. The earliest variation of DSL. It is used for wideband digital transmission within a business and between the telephone company and a customer. HDSL is symmetrical meaning an equal amount of bandwidth is available in both directions.

## I

**IC** - Integrated Circuit. An integrated circuit (IC), sometimes called a chip or microchip, is a semiconductor wafer on which thousands or millions of tiny resistors, capacitors, and transistors are fabricated. An IC can function as an amplifier, oscillator, timer, counter, computer memory, or microprocessor. A particular IC is categorized as either linear (analog) or digital, depending on its intended application.

**IP** - Internet Protocol. The method by which data is sent from one computer to another on the Internet. It is a connectionless protocol, meaning there is no established connection between the two computers. Data is sent as independent packets, also known as data units or data grams, which are contained in the IP address, a 32-bit number that identifies each sender or receiver of information. When the packets are received, they are put into the correct order by the Transmission Control Protocol (TCP).

**IPX** - Internetwork Packet Exchange. A NetWare communications protocol used to route messages from one node to another. IPX packets include net-work addresses and can be routed from one network to another.

**Interface Card (Module)** - A computer circuit board, card or module that is installed in a computer so that it can be connected to a network.

**ISDN** - Integrated Service Digital Network. A system that provides simultaneous voice and high-speed data transmission through a single channel to the user's premises. ISDN is an international standard for end-to-end digital transmission of voice, data and signaling.

**ITU-T** - International Telecommunication Union - Telecom. International body that develops worldwide standards for telecommunications technologies.

**IXC** - Inter-exchange Carrier. A common carrier providing long distance connectivity between local telephone areas. Includes AT&T, MCI and Sprint.

## K

**Kbps** - Kilobits per second or one thousand bits per second.

## L

**LAN** - Local Area Network. A computer network that links personal computers and workstations within a limited geographic area, such as a building or several contiguous buildings. Linked by cables such as coaxial cables or twisted pair, the computers connected to the LAN can access resources on other computers and shared peripheral devices. If there is a central network device, it is a file server that includes resources of use to all. To keep two workstations from accessing the LAN at the same time, LANs employ a Medium Access Control (MAC) protocol; ethernet is one such protocol.

**LED** - Light Emitting Diode. A display technology that uses a semiconductor diode that emits light when charged.

**Loopback** - A method of checking the accuracy of data transmission in which the transmitted data stream is returned, or looped back, to its source for comparison with the original data. Loopbacks can be performed on data in an analog or digital state.

**M**

**MIB** - Management Information Base. A directory listing information that used and maintained by a network's management protocol, such as SNMP.

**Mbps** - Megabits per second or one million bits per second.

**N**

**NAT** - Network Address Translation. A method for translating internal IP addresses or network addresses into a single globally unique IP address. It permits a nearly unlimited number of users of one class C Network address because global addresses are required only when a user is connected to the Internet. It also serves as a fire wall by keeping individual IP addresses hidden from the outside world. NAT is configured by defining address pools and specifying whether a port is "Inside" or "Outside". Also see IP.

**NEBS** - Network Equipment Building Systems. Adhering to standards from Bellcore for equipment used in Telco central offices (COs). It provides stringent specifications for durability, grounding, cables and hardware interfaces.

**N+1 Device Redundancy (NDR)** - A spare or redundant device is provided to replace a failed primary device in a group.

**N+1 Device Redundancy Group (NDRG)** - A collection of configured primary devices and a redundant device that will be used for redundancy.

**Narrowband Application Module** - This card resides in the DACS II AX and can be protected by the N+1 Protection Switch. The DACS II AX supports one type of narrowband application module: the Octal T1/E1 application module.

**Narrowband Primary Card** - This card resides in the N+1 Protection Switch and is used to back up an Octal T1/E1 Application Module in slots 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11.

**Narrowband Redundant Card** - This card resides in the N+1 Protection Switch and is used to back up an Octal T1/E1 Application Module; it must reside in slot 1.

**O**

**OSPF** - Open Shortest Path First. OSPF is a routing protocol that determines the best path for routing IP traffic over a TCP/IP network. It uses less router-to-router update traffic than the RIP protocol that it has been designed to replace.

**P**

**Packet** - Also known as a data unit or a datagram. A unit of data that has been broken down into a small enough size so that the Internet Protocol can handle it and the Internet transport it.

**PAP** - Password Authentication Protocol. PAP is the most basic form of authentication for logging into a network. A user's name and password are transmitted over a network and compared to a table of name-password pairs. Typically, the passwords stored in the table are encrypted. Also see CHAP.

**Parity** - A character-level error-control mechanism used with asynchronous signaling codes. A parity bit is set to either a "one" (mark) or a "zero" (space) to ensure that the total quantity of "ones" within a character are either odd (odd parity) or even (even parity). Start and stop bits are excluded from the parity calculation. Character-level error-control has not been successful, and today, parity is rarely used. Asynchronous hardware, however, requires that the parity bit be present (usually forced to "one") even if unused.

**PCM** - Pulse Coded Modulation. Transmission of analog information in digital form through sampling and encoding the samples with a fixed number of bits.

**PCS** - Personal Communications Service. A network that provides personal, terminal and service mobility. Includes broadband and narrowband in the United States.

**PLAR** - Private Line Auto Ring. A leased voice circuit that connects two single endpoints together. When the telephone handset is removed from the hook, the remote telephone automatically rings.

**Primary Device** - A device in a redundancy group that would normally carry traffic.

**Primary Slots (N+1 Protection Switch)** - Holds Interface Cards for the cards plugged into the DACS II AX's primary slots.

**Primary Slots (DACS II AX)** - Cards plugged into these slots are considered *active* and online under normal operation.

**Protected Device** - This is a primary device that will be replaced by a redundant device if it fails.

## R

**Redundant Device** - A device that will take over for a failed primary device in the same redundancy group.

**Redundancy Group** - A group of application modules consisting of primary devices which normally carry traffic and a redundant device which is in Standby mode. The redundant device takes over when a primary device in the redundancy group fails.

**Restore** - An action that occurs when traffic is returned to the primary device from the redundant device. The restore action is performed manually.

**RFC** - Request for Comments. The document series maintained by the Inter-net community that records the protocols within the Internet and gives other information.

**RIP** - Routing Information Protocol. A simple routing protocol that is part of the TCP/IP protocol suite. It determines a route based on the smallest hop count between source and destination. RIP is a distance vector protocol that routinely broadcasts routing information to its neighboring routers and is known to waste bandwidth.

**Router** - An electronic device that connects a local area network (LAN) to a wide area network (WAN) and handles the task of routing messages between the two networks.

**RS232** - RS232 is an electrical signaling specification published by the Electronic Industries Association (EIA). Although not identified in the specification, the 25-pin (DB25) connector, with specific pin assignments, is commonly accepted as "the RS232 connector." The DACS II AX supports RS232 on the Quad High Speed Module's DB25 connector via industry-standard pin assignments.

## S

**SDSL** - Single-line Digital Subscriber Line. One of four DSL technologies. SDSL delivers 1.544 Mbps both downstream and upstream over a single cop-per twisted pair. The use of a single twisted pair limits the operating range of SDSL to 10,000 feet (3048.8 meters).

**SNMP** - Simple Network Management Protocol - Network management protocol used in TCP/IP networks. SNMP monitors and controls network devices, and manages configurations, statistics collection, performance and security.

**SONET** - Synchronous Optical NETWORK. A high speed (up to 2.5 Gbps), fiber-optic transmission system for digital traffic. SONET uses time division multiplexing (TDM) to send multiple data streams simultaneously. STS-1 is the basic building block of SONET.

**Standby Slots (N+1 Protection Switch)** - Holds Interface Cards for the cards plugged into the DACS II AX's standby slots.

**Standby Slots (DACS II AX)** - Cards plugged into these slots are considered inactive and off-line under normal operation. They become active and go on-line when a card plugged into the primary slot becomes non-operational.

**STS-1** - Synchronous Transport Signal level 1. Basic building block signal of SONET, operating at 51.84 Mbps. Faster SONET rates are defined as STS-n, where n is a multiple of 51.84 Mbps.



**Switchover** - an action that occurs when a redundant device replaces a primary device that failed.

**Synchronous transmission** - Digital signals are transmitted with precise clocking. Signals have the same frequency. Individual characters contained in control bits (start and stop bits) designate the beginning and end of each character.

**System Manager Controller Card** - All of the application modules in the DACS II AX chassis are under the control of the DACS II AX on-line System Manager Card (also referred to as SMC card). There are two versions of the SMC card: SMC I and SMC II.

## T

**T1** - A high-bandwidth telephone trunk line with a capacity of 1.544 Mbps, used in North America. T1 is channelized into 24 DSOs, each capable of carrying a single voice conversation or data stream.

**TCP** - Transmission Control Protocol. The method used with the Internet Protocol (IP) to send data in the form of packets between computers over the Internet. TCP is responsible for dividing a message into packets that the IP can use, and for reassembling packets into complete message.

**TDM** - Time Division Multiplexing. A technology that transmits multiple signals simultaneously over a single transmission path. Each lower-speed signal is time sliced into one high-speed transmission.

**Telnet** - A user command and an underlying TCP/IP protocol for accessing remote computers.

**TFTP** - Trivial File Transfer Protocol. Network application that is simpler than the File Transfer Protocol (FTP) but less capable. Uses the User Datagram Protocol (UDP).

**U**

**UDP** - User Datagram Protocol. A connection less, communication transport method that offers a limited amount of service when messages are exchanged over the Internet Protocol. It is an alternative to TCP. Unlike TCP, UDP does not acknowledge or guarantee delivery, nor does it provide sequencing of packets.

**V**

**V.35** - V.35 is an electrical signaling specification published by CCITT. Although not identified in the specification, the M-series, 34-pin (Winchester-type) connector, with specific pin assignments, is commonly accepted as "the V.35 connector." V.35 signaling is also legitimately supported on DB25 connectors but the pin assignments have not been standardized within the industry. The DACS II AX Test Access Module supports V.35 per industry standards.

**V.54** - V.54 is an ITU standard for various loopback tests that can be incorporated into modems for testing the telephone circuit and isolating transmission problems. Operating modes include local and remote digital loopback and remote analog loopback.

**Virtual Tributary (VT)** - A signal designed for transport and switching of payloads smaller than the STS-1 rate. All services below DS-3 rate are transported in the VT structure. T1 payloads are equivalent to a VT-1.5, while E1 payloads are equivalent to a VT-2.

**W**

**WAN** - Wide Area Network. A communications network that is capable of spanning a geographic area larger than a metropolitan area.

**X**

**X.21** - X.21 is an electrical standard published by the CCITT that includes a 15-pin (DB15) mechanical connector identification with specific pin assignments.

**Table GL-1. Acronyms & Abbreviations**

| <b>Acronym/Abbreviation</b> | <b>Name</b>                                             |
|-----------------------------|---------------------------------------------------------|
| <b>AC</b>                   | Alternating Current                                     |
| <b>ACO</b>                  | Alarm Cut Off                                           |
| <b>ADPCM</b>                | Adaptive Differential Pulse Coded Modulation            |
| <b>AIS</b>                  | Alarm Indication Signal                                 |
| <b>AMI</b>                  | Alternate Mark Inversion                                |
| <b>ANI</b>                  | Automatic Number Identification                         |
| <b>ANSI</b>                 | American National Standards Institute                   |
| <b>ASCII</b>                | American Standard Code for Information Inter-<br>change |
| <b>ATM</b>                  | Asynchronous Transfer Mode                              |
| <b>AUI</b>                  | Attachment Unit Interface                               |
| <b>AWG</b>                  | American Wiring Gauge                                   |
| <b>B8ZS</b>                 | Binary with 8 Zero Substitution                         |
| <b>BER</b>                  | Bit Error Rate                                          |
| <b>BERR</b>                 | Bit Error Counter                                       |
| <b>BERT</b>                 | Bit Error Rate Test                                     |
| <b>BES</b>                  | Bursty Errored Seconds                                  |
| <b>bps</b>                  | Bits per second                                         |
| <b>CERR</b>                 | CRC Errors                                              |
| <b>CLEC</b>                 | Competitive Local Exchange Carrier                      |
| <b>CMI</b>                  | Control Mode Idle                                       |
| <b>CMOS</b>                 | Complementary Metal Oxide Semiconductor                 |
| <b>CODEC</b>                | Encoder/Decoder                                         |
| <b>CPE</b>                  | Customer Premises Equipment                             |
| <b>CRC</b>                  | Cyclic Redundancy Check                                 |

**Table GL-1. Acronyms & Abbreviations (Continued)**

| <b>Acronym/Abbreviation</b> | <b>Name</b>                        |
|-----------------------------|------------------------------------|
| <b>CSU</b>                  | Channel Service Unit               |
| <b>CTS</b>                  | Clear to Send                      |
| <b>D4</b>                   | Super Frame                        |
| <b>DAC</b>                  | Digital to Analog Converter        |
| <b>DACS II AX</b>           | DACS II Access Cross-Connect       |
| <b>DC</b>                   | Direct Current                     |
| <b>DCD</b>                  | Data Carrier Detect                |
| <b>DCE</b>                  | Data Circuit-Terminating Equipment |
| <b>DCS</b>                  | Digital Cross-Connect System       |
| <b>DDS</b>                  | Dataphone Digital Service          |
| <b>DID</b>                  | Direct Inward Dialing              |
| <b>DIP</b>                  | Dual Inline Package                |
| <b>DLCI</b>                 | Data Link Control Identifier       |
| <b>DO</b>                   | Data Out                           |
| <b>DNS</b>                  | Domain Name System                 |
| <b>DPT</b>                  | Dial Pulse Termination             |
| <b>DS0</b>                  | Digital Signal Level 0             |
| <b>DS1</b>                  | Digital Signal Level 1             |
| <b>DS3</b>                  | Digital Signal Level 3             |
| <b>DSL</b>                  | Digital Subscriber Line            |
| <b>DSR</b>                  | Data Set Ready                     |
| <b>DSU</b>                  | Data Service Unit                  |
| <b>DTE</b>                  | Data Terminal Equipment            |
| <b>DTMF</b>                 | Dual Tone Multi Frequency          |
| <b>DTR</b>                  | Data Terminal Ready                |
| <b>EIA</b>                  | Electronic Industries Association  |

**Table GL-1. Acronyms & Abbreviations (Continued)**

| <b>Acronym/Abbreviation</b> | <b>Name</b>                                       |
|-----------------------------|---------------------------------------------------|
| <b>E&amp;M</b>              | Receive and Transmit                              |
| <b>ES</b>                   | Errored Seconds                                   |
| <b>ESF</b>                  | Extended Superframe                               |
| <b>FCC</b>                  | Federal Communications Commission                 |
| <b>FPGA</b>                 | Field Programmable Gate Array                     |
| <b>FIFO</b>                 | First-in, First-out                               |
| <b>FS</b>                   | Failed Seconds                                    |
| <b>FSS</b>                  | Failed Signal State                               |
| <b>FTP</b>                  | File Transfer Protocol                            |
| <b>FXO</b>                  | Foreign Exchange Office                           |
| <b>FXS</b>                  | Foreign Exchange Subscriber                       |
| <b>HDLC</b>                 | High-Level Data Link Control                      |
| <b>HDSL</b>                 | High-bit rate Digital Subscriber Line             |
| <b>IAD</b>                  | Integrated Access Device                          |
| <b>IC</b>                   | Integrated Circuit                                |
| <b>IEEE</b>                 | Institute of Electrical and Electronics Engineers |
| <b>IP</b>                   | Internet Protocol                                 |
| <b>IPX</b>                  | Internetwork Packet Exchange                      |
| <b>ISDN</b>                 | Integrated Service Digital Network                |
| <b>ISP</b>                  | Internet Service Provider                         |
| <b>ITU-T</b>                | International Telecommunications Union - Telecom  |
| <b>IXC</b>                  | Inter-exchange Carrier                            |
| <b>Kbps</b>                 | Kilobits per second                               |
| <b>LAN</b>                  | Local Area Network                                |
| <b>LBO</b>                  | Line Build Out                                    |
| <b>LED</b>                  | Light Emitting Diode                              |

**Table GL-1. Acronyms & Abbreviations (Continued)**

| <b>Acronym/Abbreviation</b> | <b>Name</b>                                 |
|-----------------------------|---------------------------------------------|
| <b>LIU</b>                  | Line Interface Unit                         |
| <b>LL</b>                   | Local Loop                                  |
| <b>LOF</b>                  | Loss of Frame                               |
| <b>LOS</b>                  | Loss of Signal - DS1                        |
| <b>MAIS</b>                 | Multiframe AIS                              |
| <b>Mbps</b>                 | Megabits per second                         |
| <b>MERR</b>                 | MFAS Error                                  |
| <b>MFAS</b>                 | Multiframe Alignment Sequence (CRC4 format) |
| <b>MIB</b>                  | Management Information Base                 |
| <b>MYEL</b>                 | Multiframe Yellow Alarm                     |
| <b>NAT</b>                  | Network Address Translation                 |
| <b>NEBS</b>                 | Network Equipment Building Systems          |
| <b>NDR</b>                  | N+1 Device Redundancy                       |
| <b>NDRG</b>                 | N+1 Device Redundancy Group                 |
| <b>NI</b>                   | Network Interface                           |
| <b>NVT</b>                  | Network Virtual Terminal                    |
| <b>OCU</b>                  | Office Channel Unit                         |
| <b>OSPF</b>                 | Open Shortest Path First                    |
| <b>PCM</b>                  | Pulse Coded Modulation                      |
| <b>PCS</b>                  | Personal Communications Service             |
| <b>PLAR</b>                 | Private Line Auto Ring                      |
| <b>QOCU</b>                 | Quad Office Channel Unit                    |
| <b>RED</b>                  | Red Alarm                                   |
| <b>RL</b>                   | Remote Loop                                 |
| <b>RTS</b>                  | Request to Send                             |
| <b>RXCLK</b>                | Receive Clock                               |

**Table GL-1. Acronyms & Abbreviations (Continued)**

| <b>Acronym/Abbreviation</b> | <b>Name</b>                          |
|-----------------------------|--------------------------------------|
| <b>SDSL</b>                 | Single-line Digital Subscriber List  |
| <b>SES</b>                  | Severely Errored Seconds             |
| <b>SMC</b>                  | System Manager Card                  |
| <b>SNMP</b>                 | Simple Network Management Protocol   |
| <b>SONET</b>                | Synchronous Optical Network          |
| <b>STS-1</b>                | Synchronous Transport Signal Level 1 |
| <b>SYNC</b>                 | Synchronous                          |
| <b>TCP</b>                  | Transmission Control Protocol        |
| <b>TDM</b>                  | Time Division Multiplexing           |
| <b>TFTP</b>                 | Trivial File Transfer Protocol       |
| <b>UDP</b>                  | User Datagram Protocol               |
| <b>VAN</b>                  | Value Added Network                  |
| <b>VT</b>                   | Virtual Tributary                    |
| <b>WAN</b>                  | Wide Area Network                    |
| <b>YEL</b>                  | Yellow Alarm                         |





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