



DACS II AX 4/11
Release 10.0
User's Guide

365-359-208
Issue 1
March 2001

This material is protected by the copyright and trade secret laws of the United States and other countries. It may not be reproduced, distributed or altered in any fashion by any entity (either internal or external to Lucent Technologies), except in accordance with applicable agreements, contracts, or licensing, without the express written consent of the Customer Training and Information Products organization and the business management owner of the material.

For permission to reproduce or distribute please contact:

Product Development Manager 1 800 645 6759 (U.S.) 1 317 322 6847 (International)

Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

Federal Communications Commission (FCC) Statement

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

Security

In rare instances, unauthorized individuals make connections to the telecommunications network through the use of remote access features. In such event, applicable tariffs require that the customer pay all network charges for traffic. Lucent Technologies cannot be responsible for such charges, and will not make any allowance or give any credit for charges that result from unauthorized access.

Warranty

Lucent Technologies' DACS II AX family of products is fully warranted against defects in material or workmanship to the original owner for one year from the date of customer turnover. If the product fails due to defects in manufacturing, Lucent Technologies will repair it without charge, or replace it, at Lucent's discretion. All products identified as defective during the warranty period shall be handled through Lucent Technologies' Repair Service and Return process (RS&R). Repairs resulting from accidents, improper care or negligence, where Lucent Technologies or an authorized Lucent agent is not at fault will be made at a reasonable charge.

This warranty shall not apply to any system which has been subject to alteration or modification; or used in any manner contrary to written instructions given by Lucent Technologies. This warranty is void if service is performed by a resource other than Lucent Technologies or an authorized Lucent agent. No responsibility is assumed for any incidental or consequential damages.

Warranty will include remote technical support for trouble reporting, diagnosis and/or trouble isolation. After the warranty period expires, it is recommended that the customer purchase a Remote Technical Support contract from their Lucent Sales Representative. If a customer requires assistance with isolating a problem and has not purchased a Support Agreement, support is available at the Standard Time and Materials rates. On-site assistance is not covered under the warranty. If a customer requires on-site support, a Lucent field technician is available at our Standard Time and Materials on-site rates.

Documentation Ordering Information

The ordering number for this document is 365-359-208. To order this document, call the Lucent Technologies Customer Information Center in Indianapolis, Indiana, on 1-888-582-3688. For more ordering information, refer to "How to Order Documents" in the section "About this Guide."

Technical Assistance

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

In the United States, call: Lucent Technologies North American Regional Technical Assistance Center 1-800-225-7822. In the Far East, call: Singapore Technical Support Organization (TSO) 65-241-0880. In Europe, call: UK Technical Support Organization (TSO) 44-1-793-77-6737. In Mexico, call: Lucent Technologies de Mexico Local Field Support Organization at 91-800-LUCENT or 01-800-70-LUCENT.

Contents

	About This Guide	xxxix
	■ Overview	xi
	■ Document Organization	xli
	■ Related Information	xljii
	■ Ordering Documents	xliv
	■ Documentation Conventions	xlv

1	Overview	1-1
	■ DACS II AX Models	1-3
	■ N+1 Protection Switch	1-6
	■ System Manager Controller Card	1-8
	■ System Manager Controller Card	1-9
	■ Redundant Power Supplies	1-11
	■ Application/Interface Module Sets	1-12
	■ Equipment Specifications	1-14
	■ Technical Support	1-19

2	Installation	2-1
	■ Background	2-3
	■ Site Preparations	2-4
	■ Rack Mounting Procedures	2-5
	■ Proper Grounding	2-9
	■ Removing Power Supply Module(s)	2-10
	■ Fuse/Wattage Requirements	2-11
	■ Installing the Power Supply Module(s)	2-12
	■ Connecting the Talk Battery (For Octal Voice Module only)	2-16

Contents

■ Installing the System Manager Controller II Modules	2-17
■ Installing the Application and Interface Modules	2-19
■ Installing the N+1 Protection Switch	2-21
■ Connecting the Protection Switch Controller Card	2-24
■ Console Access	2-26
■ Logging into the DACS II AX	2-28
■ Verifying N+1 Protection Switch Installation	2-29
■ Menu Navigation	2-31
■ Help <?>Menu	2-32
■ DACS II AX Menu Structure	2-33
■ Set Up and Maintenance Activities	2-42

3	Node Summary	3-1
	■ Terms Used	3-3
	■ Node Summary Menu	3-4
	■ Parts of the Node Summary Menu	3-5
	■ Actions from the Node Summary Menu	3-9

4	System Configuration	4-1
	■ Background	4-5
	■ System Configuration Submenu	4-6
	■ Configuring a Slot	4-8
	■ Deleting Slot Contents	4-11
	■ Configuring Ports and Links	4-12
	■ Node Profile Submenu	4-13
	■ Source Clock Submenu	4-15
	■ Administering Users	4-17
	■ User Profile Manager Menu	4-18

Contents

■ Adding a User	4-19
■ Changing User Information	4-21
■ Deleting a User	4-22
■ Configuring the DACS II AX IP Address	4-23
■ Configuring the SNMP Agent	4-25
■ Setting the Current Date and Time	4-29
■ Save and Restore Database	4-31
■ Saving the AX's Configuration Data to a Host	4-32
■ Restoring the AX's Configuration Data from a Host	4-34
■ Fields for Save and Restore Database	4-36
■ SMC User Security System Summary	4-37

5	Connection Map Configuration	5-1
	■ Background	5-5
	■ Overview	5-6
	■ Connection Maps Manager Menu	5-8
	■ Displaying the Active Map	5-10
	■ Map Configuration Submenu	5-11
	■ Activating A Map	5-12
	■ Displaying a Map	5-13
	■ Displaying Selected Connections	5-16
	■ Adding A New Connection	5-18
	■ Timeslot Numbering	5-24
	■ Changing An Existing Connection	5-34
	■ Setting Up A Listening Connection	5-37
	■ Testing a Connection	5-41
	■ Copying A Map	5-46
	■ Map Definition Submenu	5-47
	■ Time of Day Configuration Submenu	5-48

Contents

6	Events	6-1
	■ Background	6-3
	■ Accessing the Events Menu	6-4
	■ Monitor Events	6-5
	■ Display Event Log	6-7
	■ Event Configuration	6-9

7	Utilities	7-1
	■ Background	7-3
	■ Utilities Menu	7-4
	■ Copy Files to Standby SMC	7-5
	■ Switchover SMCs	7-7
	■ MIB Table	7-9
	■ Ping	7-10
	■ IP Route Table	7-12
	■ ARP Table	7-16
	■ Return to Default Settings	7-18
	■ Backplane Timeslots Display	7-20
	■ Initialize SMC Rear Card Modem	7-22
	■ Download Devices Software	7-23
	■ Reset All Channel Cards	7-24
	■ Backplane Supervisory Bus Submenu	7-25
	■ Close All Other Telnet Sessions	7-27

Contents

8	Clocking	8-1
	■ Background	8-3
	■ DACS II AX Clocking Sources	8-4
	■ Clocking Example	8-7
	■ Configuring the Source Clock	8-9
	■ System Clock Source Field Descriptions	8-11

9	Alarms	9-1
	■ Overview	9-3
	■ SMC II Alarm Indicators	9-4
	■ SMC II Alarm Modes	9-7
	■ Displaying Alarm Detail	9-11
	■ Displaying Alarm Status for an Application Module	9-12
	■ Displaying Alarm Status for the N+1 Protection Switch	9-13
	■ Critical Alarm - Check Node Profile	9-15
	■ Critical Alarm on SMC	9-16
	■ Alarm Levels	9-17

10	N+1 Protection Switch	10-1
	■ Background	10-5
	■ Terms Used	10-6
	■ Regulatory Information	10-7
	■ Overview	10-10
	■ Sample Configuration	10-17
	■ Setting Up Redundancy - Overview	10-21
	■ Verify Node Profile Settings	10-22
	■ Enable Redundancy for Modules	10-24

Contents

■ Set the Protection Switch Options	10-26
■ Verifying Slot Information on Node Summary	10-28
■ Displaying Detailed Redundancy Status Information per Slot	10-30
■ Switchover	10-33
■ Restoring after a Switchover	10-36
■ Protection Switch Main Menu	10-37
■ Protection Switch Status Menu	10-38
■ N+1 Protection Switch Alarms	10-40
■ Protection Switch Utilities Menu	10-42
■ Protection Switch About Menu	10-43
■ Changing the Fan Setting	10-44
■ Cleaning/Changing the Air Filter	10-46
■ Changing the Fan Assembly	10-48

11	Quad DS-1 Module	11-1
	■ Physical Description	11-5
	■ Regulatory Information	11-6
	■ Product Safety	11-9
	■ Before You Begin	11-10
	■ Configure Slot for Quad DS-1	11-11
	■ Configure DS-1 Ports	11-12
	■ Quad DS-1 Main Menu	11-16
	■ View Configuration	11-17
	■ Statistics Menu	11-18
	■ Diagnostics Menu	11-24
	■ DS1 Diagnostic Loops	11-27
	■ Utilities Menu	11-30
	■ Set Board Status to Out of Service	11-31
	■ Set Board Status to In Service	11-32
	■ Reset Board	11-33

Contents

■ Monitor System Manager Clock	11-34
■ Display Voice Control Signals	11-36
■ Dump Connection Statistics	11-38
■ View Trunk Conditioning	11-40
■ Reload and Refresh Connection Map	11-41
■ About Menu	11-42

12	Quad High Speed Data Module	12-1
	■ Physical Description	12-3
	■ Regulatory Information	12-4
	■ Before You Begin	12-7
	■ Configure Slot for Quad High Speed Module	12-8
	■ Configure QHS Ports	12-9
	■ Quad High Speed Main Menu	12-14
	■ View Configuration	12-15
	■ Diagnostics Menu	12-16
	■ Diagnostics Field Descriptions	12-21
	■ Utilities Menu	12-23
	■ About Menu	12-28
	■ About Field Descriptions	12-29

13	DS-3 Module	13-1
	■ Physical Description	13-5
	■ Regulatory Information	13-6
	■ Before You Begin	13-7
	■ Configure Slot for DS-3 Module	13-8
	■ DS-3 Port Configuration	13-9
	■ T1 Link Configuration	13-13

Contents

■ Main Menu	13-17
■ View Configuration	13-18
■ Diagnostics Menu	13-19
■ DS-3 Module Loops	13-21
■ Line Diagnostics	13-22
■ DS3 Line Interface Unit Monitor Submenu	13-35
■ Utilities Menu	13-37
■ N+1 Redundancy Menu	13-42
■ About Menu	13-45

14	Quad OCU Module	14-1
	■ Physical Description	14-3
	■ Regulatory Information	14-6
	■ Before You Begin	14-7
	■ Configure Slot for Quad OCU Module	14-8
	■ Configure Quad OCU Ports	14-9
	■ Quad OCU Main Menu	14-12
	■ View Configuration	14-13
	■ Diagnostics Menu	14-14
	■ Utilities Menu	14-20
	■ About Menu	14-28

15	Quad DS-1 with xDSL Module	15-1
	■ Physical Description	15-5
	■ Regulatory Information	15-6
	■ Before You Begin	15-7
	■ Configure Slot for Quad DS-1	15-8
	■ Configure DS-1 Ports	15-9

Contents

■ Main Menu	<u>15-13</u>
■ View Configuration	<u>15-14</u>
■ Statistics Menu	<u>15-15</u>
■ ESF Statistics Field Descriptions	<u>15-17</u>
■ Display ESF Registers	<u>15-18</u>
■ ESF Registers Field Descriptions	<u>15-21</u>
■ Diagnostics Menu	<u>15-22</u>
■ Diagnostics Menu Field Descriptions	<u>15-26</u>
■ DSL Port Management Menu	<u>15-27</u>
■ Command Keys	<u>15-29</u>
■ View Span Status Screen	<u>15-30</u>
■ Span Status Field Descriptions	<u>15-31</u>
■ Set Clock Menu	<u>15-33</u>
■ System Settings Menu	<u>15-34</u>
■ System Settings Field Descriptions	<u>15-35</u>
■ Loopback Menu	<u>15-38</u>
■ View Performance Data Menu	<u>15-41</u>
■ Performance History Menu	<u>15-43</u>
■ Alarm History Menu	<u>15-44</u>
■ Alarm History Field Descriptions	<u>15-45</u>
■ Circuit ID# Menu	<u>15-46</u>
■ Utilities Menu	<u>15-47</u>
■ Monitor Backplane Integrity Field Descriptions	<u>15-53</u>
■ Voice Control Signal Field Descriptions	<u>15-55</u>
■ Dump Connection Statistics Field Descriptions	<u>15-57</u>
■ Reload and Refresh the Connection Map Menu	<u>15-59</u>
■ About Menu	<u>15-60</u>
■ About Menu Field Descriptions	<u>15-61</u>
■ Specifications	<u>15-62</u>

Contents

16	Test Access Module	16-1
	■ Physical Description	16-3
	■ Regulatory Information	16-4
	■ Before You Begin	16-5
	■ Configure Slot for TAM Module	16-6
	■ Configure Connection to TAM	16-7
	■ Configure TAM Ports	16-8
	■ Test Access Main Menu	16-11
	■ View Configuration	16-12
	■ Diagnostics Menu	16-13
	■ Utilities Menu	16-24
	■ About Menu	16-27
17	Octal T1/E1 Module	17-1
	■ Physical Description	17-5
	■ Regulatory Information	17-6
	■ Product Safety	17-9
	■ Before You Begin	17-10
	■ Cable Tie Mounts	17-11
	■ Configure Slot for Octal T1/E1 Module	17-12
	■ Configure T1/E1 Links	17-13
	■ Main Menu	17-17
	■ View Configuration	17-18
	■ Diagnostics	17-19
	■ Bit Error Rate Tests (BERT)	17-22
	■ Diagnostic Loops	17-25
	■ T1/E1 Link Status	17-28
	■ ESF Statistics	17-31
	■ Display 15-Minute Performance Registers	17-33

Contents

■ Display or Clear G.826 Statistics	17-35
■ Re-initialize Framers	17-37
■ Insert Errors	17-38
■ Monitor Control Signals	17-39
■ Utilities Menu	17-42
■ N+1 Redundancy Menu	17-46
■ About Menu	17-48

18	Octal Voice Module	18-1
	■ Regulatory Information	18-3
	■ Physical Description	18-4
	■ Before You Begin	18-11
	■ Configuring A Slot for the Octal Voice Module	18-12
	■ Configuring the Octal Voice Module	18-13
	■ Access the Octal Voice Card Configuration Menu	18-14
	■ Configure for an Interface Module	18-17
	■ Configure FXO-DPT Parameters	18-19
	■ Configure FXS-PLAR Parameters	18-21
	■ Configure E&M Parameters	18-23
	■ Access the Octal Voice Main Menu	18-25
	■ Diagnostics Menu	18-26
	■ Set Up Tone Generator Diagnostics	18-28
	■ Utilities Menu	18-32
	■ About Menu	18-35

Contents

19	Octal High Speed Data Module	19-1
	■ Physical Description	19-5
	■ LED Indicators	19-6
	■ Regulatory Information	19-8
	■ Port Timing	19-9
	■ Software-Selectable Interfaces	19-12
	■ Data Rates	19-14
	■ Control Signals	19-15
	■ Diagnostics	19-16
	■ Before You Begin	19-20
	■ Configure Slot for Octal High Speed Module	19-21
	■ Configure Octal High Speed Data Ports	19-22
	■ Octal High Speed Data Main Menu	19-30
	■ View Configuration	19-31
	■ Diagnostics Menu	19-32
	■ Bit Error Rate Test (BERT)	19-36
	■ Diagnostic Loops	19-38
	■ Utilities Menu	19-43
	■ About Menu	19-46
20	Channelized Router Hub	20-1
	■ Physical Description	20-9
	■ Regulatory Information	20-10
	■ Before You Begin	20-11
	■ Configure Slot for the Router Module	20-12
	■ Main Menu	20-13
	■ Configuration Menu	20-16
	■ Router Module Configuration	20-17
	■ LAN Port Configuration	20-18

Contents

■ WAN Port Configuration	20-21
■ Logical Port Configuration	20-29
■ SNMP Agent Configuration	20-36
■ SNMP Agent Configuration Field Descriptions	20-38
■ Alarm Contact Configuration	20-39
■ Bridge Address Table	20-43
■ DHCP/Bootp Relay	20-45
■ IP and OSPF Configuration	20-47
■ IP Route Table	20-49
■ IP Multicast Group	20-51
■ Additional Information on IP Multicast Groups	20-53
■ IP Route Filters Configuration	20-54
■ IP Filter Configuration	20-57
■ IP Secondary Address Configuration	20-65
■ Special Instructions for Router-to-Router Configuration using Secondary Addressing	20-68
■ IP Network Address Translation	20-69
■ Network Address Translation Entry	20-71
■ OSPF Protocol	20-74
■ OSPF Areas	20-76
■ OSPF Area Configuration Entry Field Descriptions	20-80
■ OSPF Circuits	20-81
■ OSPF Virtual Links	20-85
■ OSPF Ranges Configuration	20-88
■ OSPF Route Filters	20-91
■ RIP Route Filters	20-94
■ RIP 2	20-97
■ IPX SAP Filters	20-99
■ DHCP Server	20-104
■ Statistics Menu	20-121
■ Physical Port Statistics	20-122
■ Physical Port Statistics Display Field Descriptions	20-123

Contents

■ Logical Port Status	20-125
■ Frame Relay DLCI Statistics	20-127
■ Router Utilities Menu	20-129
■ LAN Commands - Bridge Address Table	20-131
■ LAN Commands - Spanning Tree Status	20-133
■ WAN Commands - Frame Relay Status	20-135
■ WAN Commands - PPP Status	20-140
■ IP Commands - Ping	20-143
■ IP Commands - Telnet Client	20-145
■ IP Commands - IP Route Table	20-146
■ IP Commands - ARP Table	20-151
■ IP Commands - MIB Table	20-153
■ IP Commands - Trace IP	20-154
■ IPX Commands - IPX RIP Table	20-155
■ IPX Router RIP Information Table Display Field Descriptions	20-156
■ IPX Commands - IPX SAP Table	20-158
■ IPX SAP Server Information Table Display Field Descriptions	20-159
■ IPX Commands - Trace IPX	20-160
■ IPX Commands - SAP Filtering Stats	20-161
■ Utilities Menu	20-162
■ About Menu	20-165

21	STS-1 Module	21-1
	■ Physical Description	21-5
	■ LED Descriptions	21-6
	■ Regulatory Information	21-8
	■ Before You Begin	21-9
	■ Configure Slot for STS-1 Module	21-10
	■ Configure STS-1 Module	21-11
	■ STS-1 Configuration	21-13

Contents

■ T1/E1 Link Configuration	21-17
■ Main Menu	21-21
■ View Configuration	21-22
■ Diagnostics	21-25
■ Line Diagnostics	21-27
■ BERT (Bit Error Rate Test)	21-31
■ Display or Clear G.826 Statistics	21-42
■ Reinitialize T1/E1 Framer	21-44
■ Inserting Errors	21-45
■ Diagnostic Loops	21-46
■ ESF Statistics	21-51
■ 15-Minute Performance Registers	21-53
■ View In Service Links Only	21-55
■ Line Interface Unit (LIU) Monitor	21-56
■ Monitor Control Signals	21-58
■ Utilities Menu	21-61
■ N+1 Redundancy Menu	21-65
■ N+1 Redundancy Status Field Descriptions	21-67
■ About Menu	21-68

22	Hybrid DS-3 Module	22-1
	■ Physical Description	22-5
	■ LED Descriptions	22-7
	■ Regulatory Information	22-9
	■ Before You Begin	22-10
	■ Configure Slot for Hybrid DS-3 Module	22-11
	■ Configure Hybrid DS-3 Module	22-12
	■ Hybrid DS-3 Configuration	22-14
	■ HDS3 Port Configuration	22-15
	■ DS2/G.747 Group Type Configuration	22-19

Contents

■ T1/E1 Link Configuration	22-20
■ Main Menu	22-23
■ View Configuration	22-24
■ Diagnostics Menu	22-29
■ Line Diagnostics	22-31
■ BERT (Bit Error Rate Test)	22-35
■ Status	22-40
■ Display or Clear G.826 Statistics	22-46
■ G.826 Statistics Field Descriptions	22-47
■ Re-initialize T1/E1 Framer	22-49
■ Inserting Errors	22-50
■ Diagnostic Loops	22-52
■ ESF Statistics	22-57
■ 15-Minute Performance Registers	22-59
■ View In Service Links Only	22-61
■ Line Interface Unit (LIU) Monitor	22-62
■ Monitor Control Signals	22-64
■ Utilities Menu	22-67
■ N+1 Redundancy Menu	22-71
■ About Menu	22-74

A	Software Upgrade	A-1
	■ Upgrade Overview	A-3
	■ Upgrading the SMC Software	A-4
	■ Upgrading an Application Module	A-6
	■ Telnet	A-10
	■ Multiple Telnet Sessions	A-11

Contents

B	Interfaces and Cables	B-1
	■ System Manager Interface	B-3
	■ Application Module Interfaces	B-5
	■ DB-25 to V.35 Cable Adapters (Optional)	B-13
	■ Octal High Speed Cables	B-15
	■ Cables for Redundancy	B-22

C	DACS II AX Enterprise MIB	C-1
	■ Overview	C-5
	■ DACS II AX Enterprise MIB	C-6
	■ Interface Characteristics	C-7
	■ Interface Design	C-9
	■ Enterprise MIB Tree	C-11
	■ System Manager Branch	C-12
	■ Slot Configuration Commands	C-18
	■ System Clock	C-21
	■ Connections	C-24
	■ Connection Map Commands	C-26
	■ Connection Configuration Commands	C-30
	■ Devices Branch	C-36
	■ Octal T1/E1 Device Branch	C-37
	■ T3 Device Branch	C-40
	■ STS1 Device Branch	C-44
	■ HDS3 Device Branch	C-48
	■ Traps Branch	C-53
	■ Performance Monitoring Branch	C-54

Contents

■	Diagnostics Branch	C-59
■	SNMPv1 Traps	C-63
■	Provisioning Traps	C-65
■	Alarm Traps	C-66

GL	Glossary	GL-1

IN	Index	IN-1

Figures

Figure 1-1	DACS II AX 11 - Front View	1-4
Figure 1-2	DACS II AX 4	1-5
Figure 1-3	DACS II AX 11 with N+1 Protection Switch - Front View	1-6
Figure 1-4	N+1 Protection Switch Controller Card	1-7
Figure 1-5	SMC II Front and Rear Cards	1-9
Figure 2-1	DACS II AX-11 Rack Mounting	2-5
Figure 2-2	DACS II AX-11 Flush Rack Mounting	2-6
Figure 2-3	DACS II AX-11 Center Rack Mounting	2-7
Figure 2-4	DACS II AX-4 Rack Mounting	2-8
Figure 2-5	Thread-forming Screws and Star Washer Needed for Grounding	2-9
Figure 2-6	DACS II AX 11 AC Power Connection	2-12
Figure 2-7	DACS II AX 11 DC Power Connection	2-13
Figure 2-8	DACS II AX-4 AC Power Connection	2-14
Figure 2-9	DACS II AX-4 DC Power Connection	2-15
Figure 2-10	Talk Battery Connections	2-16
Figure 2-11	SMC II Front and Rear Boards	2-17
Figure 2-12	DACS II AX-11 and Application Module	2-19
Figure 2-13	N+1 Protection Switch (rear view)	2-21
Figure 2-14	N+1 Protection Switch Controller Card	2-24
Figure 2-15	Terminal Selection Type	2-28
Figure 2-16	N+1 Protection Switch Status Menu	2-29
Figure 2-17	The Help Menu	2-32
Figure 2-18	DACS II AX Menu Structure	2-34
Figure 2-19	Main Menu Structure	2-35
Figure 2-20	Node Summary Menu Structure	2-36
Figure 2-21	System Configuration Menu Structure	2-37
Figure 2-22	Connections Map Manager Menu Structure	2-38
Figure 2-23	Events Menu Structure	2-39
Figure 2-24	Utilities Menu Structure	2-40
Figure 2-25	About Menu Structure	2-41
Figure 3-1	Node Summary Menu with the N+1 Protection Switch	3-4
Figure 3-2	Asterisk shown in slot 3 indicating an error condition	3-9
Figure 3-3	Device card alarm information exposed from Node Summary	3-11
Figure 3-4	N+1 Protection Switch alarm information exposed	3-12

Figures

Figure 3-5	SMC alarm information exposed	3-13
Figure 4-1	System Configuration Menu Options	4-6
Figure 4-2	Slot Configuration Menu	4-8
Figure 4-3	Card Slot Menu	4-9
Figure 4-4	Node Profile Menu	4-13
Figure 4-5	System Clock Source Menu	4-15
Figure 4-6	Users Profile Manager Menu	4-18
Figure 4-7	User Configuration Menu	4-19
Figure 4-8	Delete User	4-22
Figure 4-9	Port Configuration Menu	4-23
Figure 4-10	SNMP Agent Configuration Menu	4-25
Figure 4-11	Client Profiles Menu	4-26
Figure 4-12	Date and Time Menu	4-29
Figure 4-13	Save and Restore Database Menu	4-32
Figure 4-14	Save and Restore Database Menu	4-35
Figure 5-1	Map Configuration Menu	5-7
Figure 5-2	Connection Maps Manager Menu	5-8
Figure 5-3	Sample Active Connection Map	5-10
Figure 5-4	Configuration Maps Menu (Default)	5-11
Figure 5-5	Configuration Maps Menu	5-12
Figure 5-6	Map Configuration Menu	5-13
Figure 5-7	Connection Filter Configuration	5-16
Figure 5-8	Add New Connection Screen	5-18
Figure 5-9	Change Connection Screen - Example	5-20
Figure 5-10	Add A Connection Flowchart	5-21
Figure 5-11	Case A: Standard T1 DS0 Numbering Change Connection Screen	5-25
Figure 5-12	Case B: Clear T1 Framed Change Connection Screen	5-26
Figure 5-13	Case C: Clear T1 Unframed Change Connection Screen	5-27
Figure 5-14	Case D: E1 CAS Change Connection Screen	5-28
Figure 5-15	Case E: Clear E1 Framed CAS Change Connection Screen	5-29
Figure 5-16	Case F: E1 NSA Change Connection Screen	5-30
Figure 5-17	Case G - Clear E1 Framed NSA Change Connection Screen	5-31
Figure 5-18	Case H: Clear E1 Unframed Change Connection Screen	5-32
Figure 5-19	Case I: Gateway Cross-Connect - T1 to E1 CAS Change Connection Screen	5-33

Figures

Figure 5-20	Connection Name Truncated	5-34
Figure 5-21	Change Connection Screen - Example	5-35
Figure 5-22	Add A New Connection Screen (Listen-Source)	5-38
Figure 5-23	Add A New Connection Screen (Listen-Destination)	5-39
Figure 5-24	Map Configuration Menu (Listening Connections Configured)	5-40
Figure 5-25	Test Connection Screen	5-41
Figure 5-26	Monitor-Source Testing	5-42
Figure 5-27	Monitor-Destination Testing	5-43
Figure 5-28	Split-Source Testing	5-44
Figure 5-29	Split-Destination Testing	5-45
Figure 5-30	Definition Maps Menu	5-47
Figure 5-31	Time of Day Configuration Map Manager	5-48
Figure 6-1	Events Menu Structure	6-3
Figure 6-2	Events Menu	6-4
Figure 6-3	System Events Menu	6-5
Figure 6-4	Event Log	6-7
Figure 6-5	Event Configuration Menu	6-9
Figure 7-1	Utilities Menu	7-4
Figure 7-2	Copy File System Menu	7-6
Figure 7-3	Switchover SMC Menu	7-7
Figure 7-4	MIB Display	7-9
Figure 7-5	Ping Menu Display	7-10
Figure 7-6	IP Route Table Menu	7-12
Figure 7-7	Show IP Route Menu	7-13
Figure 7-8	Dump IP Route	7-14
Figure 7-9	ARP Table Utility Display	7-16
Figure 7-10	Default Settings Display	7-19
Figure 7-11	Backplane Timeslots Display	7-21
Figure 7-12	Initialize SMC Rear Card Modem	7-22
Figure 7-13	Reset All Channel Cards	7-24
Figure 7-14	Backplane Supervisory Bus - Utilities Menu	7-25
Figure 7-15	Bus Speed Dump Submenu	7-26
Figure 7-16	Terminated Telnet Session Message	7-28
Figure 8-1	External Station Clock Inputs	8-5

Figures

Figure 8-2	Clock Failure and Recovery Process	8-8
Figure 8-3	System Clock Source Menu	8-9
Figure 9-1	SMC II front and rear boards	9-4
Figure 9-2	SMC II Alarm Contacts	9-6
Figure 9-3	Node Summary Menu - Alarm Contacts are Enabled	9-10
Figure 9-4	An Exposed Alarm on a Device Card	9-12
Figure 9-5	An Exposed Alarm on the Protection Switch	9-13
Figure 9-6	An exposed alarm on the SMCB	9-16
Figure 10-1	N+1 Protection Switch and DACS II AX 11	10-11
Figure 10-2	PSX 5300 Rear View - Slot Assignments for Redundancy	10-14
Figure 10-3	PSX 5200 Rear View - Slot Assignments for Redundancy	10-16
Figure 10-4	Sample Configuration of DACS II AX with Protection Switch (Rear View)	10-17
Figure 10-5	Node Profile Menu	10-22
Figure 10-6	Slot Configuration Menu	10-24
Figure 10-7	Slot Configuration Screen	10-25
Figure 10-8	Node Summary Menu	10-28
Figure 10-9	Octal T1/E1 Main Menu	10-30
Figure 10-10	N+1 Device Redundancy Menu	10-31
Figure 10-11	N+1 Redundancy Status Menu	10-32
Figure 10-12	Protection Switch Main Menu	10-37
Figure 10-13	Protection Switch Status Menu	10-38
Figure 10-14	An Exposed Alarm on the Protection Switch	10-40
Figure 10-15	Protection Switch Utilities Menu	10-42
Figure 10-16	Protection Switch About Menu	10-43
Figure 10-17	N+1 Protection Switch Status Menu	10-44
Figure 10-18	Front of N+1 Protection Switch with the NEBS Compliant Filter	10-46
Figure 10-19	Front View of Fan Assembly	10-48
Figure 11-1	Quad DS-1 Application/Interface Module Set	11-5
Figure 11-2	Quad T1 Card Port Configuration Menu	11-12
Figure 11-3	Quad DS-1 Main Menu	11-16
Figure 11-4	ESF Statistics Menu	11-18
Figure 11-5	ESF Statistics Screen	11-19
Figure 11-6	ESF Registers Summary Menu	11-21
Figure 11-7	ESF Registers Screen	11-22

Figures

Figure 11-8	Quad DS-1 Diagnostics Menu	11-24
Figure 11-9	Loop Diagnostics Manager	11-25
Figure 11-10	Quad DS-1 Bert Manager	11-26
Figure 11-11	Utilities Menu	11-30
Figure 11-12	Board Status Screen	11-31
Figure 11-13	Change Board Status Screen	11-32
Figure 11-14	Monitor Backplane Integrity Screen	11-34
Figure 11-15	Voice Control Signal Display	11-36
Figure 11-16	Dump Connection Statistics Screen	11-38
Figure 11-17	Trunk Conditioning	11-40
Figure 11-18	Reload and Refresh Connection Map Fields	11-41
Figure 11-19	Quad DS-1 About Screen	11-42
Figure 12-1	Quad High Speed Application/Interface Module Set	12-3
Figure 12-2	Quad High Speed Configuration Menu	12-9
Figure 12-3	Quad High Speed Main Menu	12-14
Figure 12-4	Quad High Speed Diagnostic Menu	12-16
Figure 12-5	Quad High Speed Loop Manager	12-17
Figure 12-6	Quad High Speed Loop Manager	12-18
Figure 12-7	Quad High Speed Bert Manager	12-19
Figure 12-8	Utilities Menu	12-23
Figure 12-9	Out of Service Board Status Screen	12-24
Figure 12-10	Change Board Status Screen	12-25
Figure 12-11	Reset Quad High Speed Board Screen	12-26
Figure 12-12	Monitor Backplane Integrity Screen	12-27
Figure 12-13	Quad High Speed About Screen	12-28
Figure 13-1	DS-3 Application/Interface Module Set	13-5
Figure 13-2	Module Configuration Menu	13-10
Figure 13-3	DS3 Port Configuration Submenu	13-10
Figure 13-4	DS3 Module Main Menu	13-17
Figure 13-5	DS3 Module Diagnostics Menu	13-19
Figure 13-6	DS-3 Module Loops	13-21
Figure 13-7	Diagnostics Manager Submenu	13-22
Figure 13-8	T3/LIU Loop Select Submenu	13-25
Figure 13-9	T1 Loop Select Submenu	13-26

Figures

Figure 13-10	T1 Framer Channel Status Display	13-28
Figure 13-11	ESF Statistics Display	13-31
Figure 13-12	15-min Performance Registers Display	13-33
Figure 13-13	Line Interface Unit Monitor Display	13-35
Figure 13-14	Utilities Menu	13-37
Figure 13-15	Reset Board Screen	13-38
Figure 13-16	Board Status Screen	13-40
Figure 13-17	Change Board Status Screen	13-41
Figure 13-18	DS3 Module N+1 Redundancy Menu	13-42
Figure 13-19	N+1 Redundancy Status Display	13-43
Figure 13-20	About DS3 Module Display	13-45
Figure 14-1	Quad OCU Application/Interface Module Set	14-3
Figure 14-2	RJ48S Jack and Plug End	14-5
Figure 14-3	Configuration Manager Menu	14-9
Figure 14-4	Configuration Submenu	14-10
Figure 14-5	Quad OCU Main Menu	14-12
Figure 14-6	Diagnostic Menu	14-14
Figure 14-7	Diagnostic Monitor Menu	14-15
Figure 14-8	Quad OCU Loops	14-18
Figure 14-9	Quad OCU Utilities Menu	14-20
Figure 14-10	Board Status Screen	14-21
Figure 14-11	Out of Service Board Status Screen	14-22
Figure 14-12	Monitor System Clocks Screen	14-23
Figure 14-13	Monitor Backplane Integrity Screen	14-24
Figure 14-14	Reset QOCU Board	14-26
Figure 14-15	Quad OCU About Screen	14-28
Figure 15-1	Quad DS-1 Application with xDSL Interface Module Set	15-5
Figure 15-2	Quad T1 Card Port Configuration Menu	15-9
Figure 15-3	Quad DS-1 Main Menu with DSL Port Management	15-13
Figure 15-4	ESF Statistics Menu	15-15
Figure 15-5	ESF Statistics Screen	15-16
Figure 15-6	ESF Statistics Menu	15-18
Figure 15-7	ESF Registers Summary Submenu	15-19
Figure 15-8	ESF Registers Screen	15-20

Figures

Figure 15-9	Quad DS-1 Diagnostics Menu	<u>15-23</u>
Figure 15-10	Quad DS-1 BERT Manager Menu	<u>15-24</u>
Figure 15-11	DSL Port Management Menu	<u>15-27</u>
Figure 15-12	Maintenance Terminal Main Menu	<u>15-28</u>
Figure 15-13	View Span Status Screen	<u>15-30</u>
Figure 15-14	Set Clock Menu	<u>15-33</u>
Figure 15-15	System Settings Menu	<u>15-34</u>
Figure 15-16	Loopback Menu	<u>15-38</u>
Figure 15-17	Quad DS-1 with xDSL Loops	<u>15-40</u>
Figure 15-18	View Performance Data Menu	<u>15-41</u>
Figure 15-19	View Performance History Menu	<u>15-43</u>
Figure 15-20	View Alarm History Menu	<u>15-44</u>
Figure 15-21	Enter Circuit ID #	<u>15-46</u>
Figure 15-22	Quad DS-1 Utilities Menu	<u>15-47</u>
Figure 15-23	Board Status Screen	<u>15-48</u>
Figure 15-24	Change Board Status Screen	<u>15-49</u>
Figure 15-25	Reset Quad DS-1 Board Screen	<u>15-50</u>
Figure 15-26	Monitor Backplane Integrity Screen	<u>15-51</u>
Figure 15-27	Voice Control Signal Display	<u>15-54</u>
Figure 15-28	Dump Connection Statistics Screen	<u>15-56</u>
Figure 15-29	Trunk Conditioning	<u>15-58</u>
Figure 15-30	Reload and Refresh Connection Map Fields	<u>15-59</u>
Figure 15-31	Quad DS-1 with xDSL About Screen	<u>15-60</u>
Figure 16-1	Test Access Application/Interface Module Set	<u>16-3</u>
Figure 16-2	TAM Configuration Menu	<u>16-9</u>
Figure 16-3	TAM Main Menu	<u>16-11</u>
Figure 16-4	Diagnostics Menu	<u>16-13</u>
Figure 16-5	Local Loop Selection Setup Menu	<u>16-14</u>
Figure 16-6	Set Local Loop Menu	<u>16-15</u>
Figure 16-7	Remote Loop Selection Setup Menu	<u>16-16</u>
Figure 16-8	Clear Remote Loop Menu	<u>16-17</u>
Figure 16-9	Set Up Remote Loop Menu	<u>16-18</u>
Figure 16-10	Bit Error Test (BERT) Selection Menu	<u>16-19</u>
Figure 16-11	Start BERT Test Menu	<u>16-20</u>

Figures

Figure 16-12	Test Access Loops	16-22
Figure 16-13	TAM Utilities Menu	16-24
Figure 16-14	Reset Board Screen	16-25
Figure 16-15	TAM About Screen	16-27
Figure 17-1	Octal T1/E1 Application/Interface Module Set	17-5
Figure 17-2	Tie-Wrap Attachment Locations	17-11
Figure 17-3	Links Configuration Menu	17-13
Figure 17-4	Link Configuration Entry Submenu	17-14
Figure 17-5	Octal T1/E1 Main Menu	17-17
Figure 17-6	Diagnostics Manager Submenu	17-20
Figure 17-7	Diagnostics BERT Select Submenu	17-22
Figure 17-8	Start New Test Screen	17-24
Figure 17-9	Octal T1/E1 Diagnostic Loops	17-25
Figure 17-10	Loop Select Submenu	17-26
Figure 17-11	Expose - T1/E1 Link Status Submenu	17-28
Figure 17-12	ESF Statistics Display	17-31
Figure 17-13	15-Minute Performance Registers Display	17-33
Figure 17-14	G.826 Statistics Display	17-35
Figure 17-15	PCM Signalling Display Menu	17-39
Figure 17-16	PCM Signalling Status Display	17-40
Figure 17-17	Utilities Menu	17-42
Figure 17-18	Board Status Out Of Service Screen	17-44
Figure 17-19	Reset In Service Screen	17-45
Figure 17-20	N+1 Redundancy Status Menu	17-46
Figure 17-21	About Display	17-48
Figure 18-1	Octal Voice Application Module	18-4
Figure 18-2	Interface Modules used with the Octal Voice Application Module	18-6
Figure 18-3	E&M Type I Signaling	18-8
Figure 18-4	E&M Type I Signaling Operation	18-9
Figure 18-5	E&M Type II Signaling Operation (Default)	18-9
Figure 18-6	Jumper Settings for the E&M Interface Card	18-10
Figure 18-7	Octal Voice Card Configuration Menu	18-14
Figure 18-8	Octal Voice Card Configuration Menu	18-17
Figure 18-9	FXO-DPT Configuration Submenu	18-19

Figures

Figure 18-10	FXS-PLAR Configuration Submenu	18-21
Figure 18-11	E&M Configuration Submenu Menu	18-23
Figure 18-12	Voice Card Main Menu	18-25
Figure 18-13	Octal Voice Card Diagnostics Menu	18-26
Figure 18-14	Octal Voice Card Diagnostics Submenu	18-27
Figure 18-15	Octal Voice Card Diagnostics Submenu	18-28
Figure 18-16	Tone Generator Setup Submenu	18-29
Figure 18-17	Octal Voice Card Utilities Menu	18-32
Figure 18-18	Display Voice Signaling Status Menu	18-33
Figure 18-19	Sample About Menu with E&M Interface Module	18-35
Figure 19-1	OHSD Application/Interface Module Set	19-5
Figure 19-2	Internal Timing	19-9
Figure 19-3	External Timing	19-10
Figure 19-4	Internal/External Timing	19-11
Figure 19-5	External testing using a Local Loopback	19-16
Figure 19-6	External testing using a V.54 Loopback	19-17
Figure 19-7	External testing using a Remote Loopback	19-17
Figure 19-8	External testing using a Backplane Loopback	19-18
Figure 19-9	External testing using a Bit Error Rate Test	19-18
Figure 19-10	Remote OCU Non-Latching Test	19-19
Figure 19-11	Ports Configuration Menu	19-23
Figure 19-12	Port Configuration Submenu	19-24
Figure 19-13	Port 2 Configured for DS0-A (9.6K) or NxDS0	19-25
Figure 19-14	Port 1 configured for DS0-A Special or NxDS0 Special Mode	19-26
Figure 19-15	Port 1 configured for ITU-X.21	19-27
Figure 19-16	Octal High Speed Main Menu	19-30
Figure 19-17	Diagnostics Menu	19-32
Figure 19-18	Diagnostics Manager	19-33
Figure 19-19	BERT Select Submenu	19-36
Figure 19-20	Loop Select Screen	19-38
Figure 19-21	Port Status - DS0-A (9.6) Special or NxDS0 Special Mode	19-40
Figure 19-22	Port Status - NxDS0 or NxDS0-A (9.6K) mode and an EI type other than ITU-X.21	19-41
Figure 19-23	Port Status - NxDS0 or NxDS0-A (9.6K) mode and EI Type ITU-X.21	19-42

Figures

Figure 19-24	Reset Device Screen	19-43
Figure 19-25	Board Status Screen	19-44
Figure 19-26	Board Status Screen	19-45
Figure 19-27	Octal High Speed Data About Screen	19-46
Figure 20-1	Router Module Menu Structure	20-14
Figure 20-2	Router Main Menu	20-15
Figure 20-3	Configuration Menu Structure	20-16
Figure 20-4	Configuration Menu	20-17
Figure 20-5	LAN Configuration Submenu	20-18
Figure 20-6	WAN Configuration Submenu (Time Slot Allocation)	20-21
Figure 20-7	WAN Virtual Port Configuration Submenu (WAN 1)	20-23
Figure 20-8	WAN Virtual Port Configuration Submenu (WAN 2-32)	20-24
Figure 20-9	Logical Port Summary Submenu	20-29
Figure 20-10	Logical Port Parameters Submenu	20-30
Figure 20-11	Filter Selection Submenu	20-34
Figure 20-12	SNMP Agent Configuration Submenu	20-37
Figure 20-13	Alarm Jumper Location	20-40
Figure 20-14	User Alarms Configuration Submenu	20-41
Figure 20-15	Bridge Address Configuration Menu	20-43
Figure 20-16	DHCP/Bootp Relay Configuration Submenu	20-45
Figure 20-17	IP and OSPF Configuration Submenu	20-47
Figure 20-18	IP Route Table Configuration Submenu	20-49
Figure 20-19	IP Multicast Group Configuration Submenu	20-51
Figure 20-20	Depiction of an IP Multicast Group	20-53
Figure 20-21	IP Route Filters Configuration Submenu	20-54
Figure 20-22	IP Route Filters Configuration Entry Submenu	20-55
Figure 20-23	IP Filter Selection Submenu	20-58
Figure 20-24	Single Filter Configuration Submenu	20-59
Figure 20-25	Single Rule Configuration Submenu	20-60
Figure 20-26	IP Filter Selection Submenu	20-62
Figure 20-27	IP Secondary Address Configuration Submenu	20-65
Figure 20-28	IP Secondary Address Configuration Entry Submenu	20-66
Figure 20-29	Sample Router-to-Router Configuration with Multiple Homing	20-68
Figure 20-30	Network Address Translation Configuration Submenu	20-69

Figures

Figure 20-31	Network Address Translation Configuration Entry Submenu	20-71
Figure 20-32	OSPF Protocol	20-74
Figure 20-33	OSPF Areas Configuration Submenu	20-77
Figure 20-34	OSPF Area Configuration Entry Submenu	20-79
Figure 20-35	OSPF Circuit Submenu	20-81
Figure 20-36	OSPF Circuit Entry Submenu	20-82
Figure 20-37	OSPF Virtual Links Configuration Submenu	20-85
Figure 20-38	OSPF Virtual Link Configuration Entry Submenu	20-86
Figure 20-39	OSPF Ranges Configuration Submenu	20-88
Figure 20-40	OSPF Range Configuration Entry Submenu	20-89
Figure 20-41	OSPF Route Filters Configuration Submenu	20-91
Figure 20-42	OSPF Route Filter Configuration Entry Submenu	20-92
Figure 20-43	RIP Route Filters Submenu	20-94
Figure 20-44	RIP Route Filter Entry Submenu	20-95
Figure 20-45	RIP 2 Submenu	20-97
Figure 20-46	IPX SAP Filter Selection Submenu	20-99
Figure 20-47	IPX SAP Filter Configuration Submenu	20-100
Figure 20-48	IPX SAP Filter Single Rule Configuration Submenu	20-102
Figure 20-49	DHCP Main Menu	20-105
Figure 20-50	DHCP Server Dynamic Configuration Menu	20-106
Figure 20-51	DHCP Server Pool Configuration Menu	20-107
Figure 20-52	DHCP Server Static Configuration Menu	20-109
Figure 20-53	DHCP Server Pool Configuration Menu	20-110
Figure 20-54	DHCP Statistics Submenu	20-112
Figure 20-55	DHCP Pool Statistics Submenu	20-113
Figure 20-56	DHCP Pool Statistics Display	20-113
Figure 20-57	DHCP Used Ip Statistics Display	20-115
Figure 20-58	DHCP Options Submenu	20-117
Figure 20-59	Netbios Scope Configuration Submenu	20-119
Figure 20-60	Netbios Name Server Configuration Submenu	20-120
Figure 20-61	Statistics Menu Structure	20-121
Figure 20-62	Statistics Menu	20-121
Figure 20-63	Physical Port Statistics Submenu	20-122
Figure 20-64	Logical Port Status Display	20-125

Figures

Figure 20-65	DLCI Statistics Display	20-127
Figure 20-66	Router Utilities Menu Structure	20-129
Figure 20-67	Router Utilities Menu	20-130
Figure 20-68	Bridge Address Table Display	20-131
Figure 20-69	Spanning Tree Information Display	20-133
Figure 20-70	Frame Relay Port Status Display	20-135
Figure 20-71	PPP Port Status Display	20-140
Figure 20-72	Ping Utility Submenu	20-143
Figure 20-73	Telnet Client Prompt	20-145
Figure 20-74	IP Route Table Submenu	20-146
Figure 20-75	Show IP Route Submenu	20-147
Figure 20-76	IP Route Table Display	20-149
Figure 20-77	ARP Table Display	20-151
Figure 20-78	MIB Table Display	20-153
Figure 20-79	Trace IP Utility Display (Trace Log)	20-154
Figure 20-80	IPX Router RIP Information Table Display	20-155
Figure 20-81	IPX SAP Server Information Table Display	20-158
Figure 20-82	Trace IPX Utility Display (Trace Log)	20-160
Figure 20-83	SAP Filtering Stats Display	20-161
Figure 20-84	Utilities Menu Structure	20-162
Figure 20-85	Utilities Menu	20-163
Figure 20-86	About Display	20-165
Figure 21-1	STS-1 Application/Interface Module Set	21-5
Figure 21-2	Configuration Menu	21-12
Figure 21-3	STS-1 Configuration Submenu	21-15
Figure 21-4	T1/E1 Links Configuration Submenu	21-17
Figure 21-5	Link Configuration Submenu	21-18
Figure 21-6	STS-1 Main Menu	21-21
Figure 21-7	View STS1 Configuration Submenu	21-22
Figure 21-8	View T1/E1 Links Configuration Submenu	21-23
Figure 21-9	View Individual T1/E1 Link Configuration Submenu	21-24
Figure 21-10	Diagnostics Menu	21-25
Figure 21-11	Diagnostics Manager Submenu	21-27
Figure 21-12	Bert Selection Submenu	21-32

Figures

Figure 21-13	LIU Bert Submenu	21-34
Figure 21-14	T1/E1 Link Status Submenu	21-36
Figure 21-15	STS-1 Mapper Link Status Submenu	21-40
Figure 21-16	G.826 Statistics Display	21-42
Figure 21-17	STS-1 Module Loops	21-46
Figure 21-18	Loop Selection Screen	21-47
Figure 21-19	Process Loop Screen	21-48
Figure 21-20	Mapper/LIU Loop Selection Screen	21-50
Figure 21-21	ESF Statistics Display	21-51
Figure 21-22	15-min Performance Registers Display	21-53
Figure 21-23	Diagnostics Manager with In-Service Links Displayed	21-55
Figure 21-24	Line Interface Unit Monitor Display	21-56
Figure 21-25	PCM Signalling Display Menu.	21-58
Figure 21-26	PCM Signalling Status Display	21-59
Figure 21-27	Reset Board Screen	21-61
Figure 21-28	Board Status Screen	21-63
Figure 21-29	Board Status Screen	21-64
Figure 21-30	STS-1 Module N+1 Redundancy Menu	21-65
Figure 21-31	N+1 Redundancy Status Menu	21-66
Figure 21-32	About STS-1 Module Display	21-68
Figure 22-1	HDS-3 Configuration Menu	22-13
Figure 22-2	HDS3 Port Configuration Submenu	22-15
Figure 22-3	DS2/G.747 Group Type Configuration Submenu	22-19
Figure 22-4	T1/E1 Link Configuration Submenu	22-20
Figure 22-5	Link Configuration Submenu	22-21
Figure 22-6	Configuration Menu	22-24
Figure 22-7	HDS3 Port Configuration	22-25
Figure 22-8	HDS3 Framer DS2/G.747 Group Type Configuration	22-26
Figure 22-9	T1/E1 Link Configuration	22-27
Figure 22-10	Link Configuration	22-28
Figure 22-11	Diagnostics Menu	22-30
Figure 22-12	Diagnostics Manager Submenu	22-31
Figure 22-13	BERT Selection Submenu	22-36
Figure 22-14	LIU Bert Submenu	22-38

Figures

Figure 22-15	T1/E1 Link Status Submenu	22-40
Figure 22-16	HDS-3 Framer Status Display	22-43
Figure 22-17	G.826 Statistics Display	22-46
Figure 22-18	Hybrid DS-3 Module Loops	22-52
Figure 22-19	Loop Selection Screen	22-53
Figure 22-20	T3 Framer/LIU Loop Selection Screen	22-56
Figure 22-21	ESF Statistics Display	22-57
Figure 22-22	15-Minute Performance Registers Display	22-59
Figure 22-23	Diagnostics Manager with In-Service Links Displayed	22-61
Figure 22-24	Line Interface Unit Monitor Display	22-62
Figure 22-25	PCM Signalling Display Menu.	22-64
Figure 22-26	PCM Signalling Display Menu	22-65
Figure 22-27	Utilities Menu	22-67
Figure 22-28	Board Status Screen	22-69
Figure 22-29	Board Status Screen	22-70
Figure 22-30	Hybrid DS-3 Module N+1 Redundancy Menu	22-71
Figure 22-31	N+1 Redundancy Status Menu	22-72
Figure 22-32	About HT3 Module Display	22-74
Figure A-1	Program Load Menu	A-7
Figure A-2	View-only Access Message	A-11
Figure A-3	Maximum Number of Telnet Sessions Message	A-12
Figure C-1	Enterprise MIB Tree	C-11
Figure C-2	System Manager Branch - Detailed View	C-12
Figure C-3	Devices Branch - Detailed View	C-36
Figure C-4	Traps Branch - Detailed View	C-53
Figure C-5	Performance Monitoring Branch - Detailed View	C-54
Figure C-6	Diagnostics Branch - Detailed View	C-59
Figure C-7	SNMP Traps - Detailed View	C-63

Tables

Table 1-1	Module Sets	1-14
Table 1-2	DACS II AX Units	1-17
Table 1-3	Fuse Requirements	1-18
Table 2-1	Fuse Requirements	2-11
Table 4-1	SMC User Security Chart	4-37
Table 5-1	Connection Maps Manager Menu Options	5-9
Table 5-2	Connection Map Commands	5-15
Table 5-3	T1/E1 Numbering Schemes	5-24
Table 8-1	Application Modules That Can be Used for Timing Source	8-4
Table 9-1	ALARM Connector Pin Assignments and Contact States for Standard Mode	9-8
Table 9-2	Alarm Connector Pin Assignments and Contact States for Local Audio Mode	9-9
Table 9-3	Slot Alarm Level	9-17
Table 9-4	Device Alarm Level	9-17
Table 9-5	T1/E1 Port Alarms	9-18
Table 9-6	DS3 Port Alarms	9-19
Table 9-7	High Speed Port Alarms	9-20
Table 9-8	OCU Port Alarms	9-20
Table 9-9	Test Access Module Alarms	9-20
Table 9-10	Octal Voice Port Alarms	9-21
Table 9-11	Router Port Alarms	9-21
Table 9-12	STS-1 Port Alarms	9-22
Table 9-13	Hybrid DS3 Port Alarms	9-23
Table 9-14	Power Supply Alarms	9-23
Table 9-15	Protection Switch Alarms	9-24
Table 9-16	Protection Switch Line Card Alarms	9-24
Table 10-1	PSX 5300 Slot Assignments for Redundancy	10-15
Table 10-2	PSX 5200 Slot Assignments for Redundancy	10-16
Table 11-1	Loop Selections	11-28
Table 14-1	Loopback Test Descriptions	14-16
Table 15-1	Maintenance Terminal Main Menu Commands	15-29
Table 15-2	Quad DS-1 with xDSL Loops	15-39
Table 15-3	Quad DS-1 with xDSL Module Specifications	15-62
Table 15-4	Pin Assignments	15-65

Tables

Table 15-5	Locally-Powered HDSL Configuration	15-65
Table 15-6	Line Grounding	15-66
Table 15-7	PCB Rev. 0 Ohm Resistor Jumper	15-66
Table 15-8	Indicators	15-66
Table 15-9	DIP Switch Settings	15-67
Table 19-1	OHSD Port-Level Indicators - STATUS	19-6
Table 19-2	OHSD Port-Level Indicators - TEST	19-7
Table 19-3	OHSD Module-Level Indicator - READY	19-7
Table 19-4	Software-Selectable Interfaces	19-12
Table 19-5	Software-Selectable Interfaces for Special Data Mode	19-13
Table 19-6	Data Rates	19-14
Table 19-7	Control Lead Options	19-15
Table 19-8	Control Lead Options for Special Mode	19-15
Table 20-1	RFC 1315/2115 Cause Codes (Last Two Digits)	20-138
Table 20-2	Manufacturer-Unique Cause Codes (First Two Digits)	20-139
Table 21-1	STS-1 Mapping	21-14
Table A-1	Example of Multiple Telnet Sessions	A-13
Table A-2	SMC Menu Access	A-15
Table A-3	Quad High Speed Multi-user Menus	A-17
Table A-4	Quad T-1 Multi-user Menus	A-18
Table A-5	T3 Multi-user Menus	A-19
Table A-6	Octal Voice EM Multi-user Menus	A-20
Table A-7	Octal T1/E1 Multi-user Menus	A-21
Table B-1	Ethernet 10Base-T	B-3
Table B-2	Terminal (TERM) Port	B-3
Table B-3	RJ11	B-4
Table B-4	DACS II AX Interface	B-5
Table B-5	DACS II AX Interface Pin Assignments	B-6
Table B-6	QOCU 56/64 Kbps DDS Port (RJ48S)	B-7
Table B-7	Octal T1/E1 Pinout	B-8
Table B-8	Octal Voice - E&M	B-10
Table B-9	Octal Voice - FXO and FXS	B-12
Table B-10	DB-25 to V.35 Cable Adapters	B-13
Table B-11	EIA-232 M/M Straight-through Cable	B-16

Tables

Table B-12	EIA-530 M/M Straight-through Cable.	B-17
Table B-13	EIA-530-A M/M Straight-through Cable	B-18
Table B-14	EIA-422 M/M Straight-through Cable	B-19
Table B-15	ITU-V.35 M/M Straight-through Cable	B-20
Table B-16	ITU-X.21 M/M Straight-through Cable	B-21
Table B-17	50-Pin M to 50-Pin M cat3 Cable for Octal T1/E1 Redundancy	B-23
Table B-18	DB9 TO DB9 Straight-through Cable for N + 1 Protection Switch	B-25
Table C-1	Resource Table - System Resources	C-14
Table C-2	Resource Alarm Table	C-15
Table C-3	Slot Configuration Table Object Descriptions	C-16
Table C-4	System Profile Group Object Description	C-20
Table C-5	System Date & Time Group Object Description	C-21
Table C-6	System Clock Source Configuration Group Object Description	C-22
Table C-7	Connection Map Table Column Description	C-25
Table C-8	Connection Table Column Description	C-28
Table C-9	NDR Group Object Description	C-32
Table C-10	Device Download Table.	C-35
Table C-11	Octal T1/E1 Configuration Table Column Description	C-37
Table C-12	T3 Port Configuration Table Column Description	C-40
Table C-13	T3 T1 Configuration Table Column Description	C-42
Table C-14	STS1 Mapper Configuration Table Column Description	C-44
Table C-15	STS1 T1/E1 Configuration Table Column Description	C-46
Table C-16	HDS3 Port Configuration Table Column Description	C-48
Table C-17	HDS3 T1/E1 Configuration Table Column Description	C-51
Table C-18	DS1/E1 ESF Current Statistics Table	C-55
Table C-19	DS1/E1 ESF 24-hour Statistics Table	C-56
Table C-20	DS1/E1 G.826 Statistics Table	C-57
Table C-21	DS1/E1 Test Statistics Table	C-60
Table C-22	Trap Definitions	C-64
Table C-23	Slot Alarm Level	C-66
Table C-24	Device Alarm Level	C-67
Table C-25	T1/E1 Alarm Level	C-67
Table C-26	DS3 Port Alarm Level	C-69
Table C-27	High Speed Port Alarm Level	C-70

Tables

Table C-28	OCU Port Alarm Level	C-71
Table C-29	TAM Port Alarm Level	C-72
Table C-30	Voice Port Alarm Level	C-72
Table C-31	Router Port Alarm Level	C-73
Table C-32	HDS3 Port Alarm Level	C-73
Table C-33	STS1 Port Alarm Level	C-74
Table C-34	Power Supply Alarm Level	C-76
Table C-35	Protection Switch Alarm Level	C-76
Table C-36	Protection Switch Line Card Port Alarm Level	C-77
Table GL-1	Acronyms & Abbreviations	GL-13

About This Guide

Contents

■ Overview	xl
Purpose of This Guide	xl
Intended Audience	xl
Recommended Prerequisites	xl
What's New in this Release?	xl
■ Document Organization	xli
Chapter Contents	xli
Related Information	xliii
Related Documents and Software CD-ROM	xliii
SMC I	xliii
Training Course	xliii
■ Ordering Documents	xliv
How to Order Documents	xliv
■ Documentation Conventions	xlv
Typeface	xlv
Terminology	xlv
Screens	xlv

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 10.0.

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 DACS II AX
 - SNMP and IP concepts
 - application modules
 - digital cross-connect systems
-

What's New in this Release?

DACS II AX Release 10.0 includes:

- **PSX 5300** - this new protection switch provides an additional 6+1 broadband bus, and a revised controller module. With the additional broadband bus, this protection switch can provide redundancy for two groups of broadband modules, for a maximum of nine protected broadband modules.

The PSX 5300 provides all the capability of the original protection switch (PSX 5200). It provides redundancy for T1/E1, DS-3, hybrid DS-3, and STS-1 application modules. It can automatically detect a hardware failure in one of the protected modules and switch in the redundant card to take over for the failed card. The PSX 5300 Protection Switch can be used with Release 10.0 or higher.

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** 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: Software Upgrade** provides information on using TFTP to download software to the SMC II. For details specific to this release, refer to *DACS II AX Release 10.0 Software Release Description*. 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: DACS II AX Enterprise MIB** provides information for engineers designing a Network Management System to manage the DACS II AX using SNMP and the enterprise MIB.
 - **Glossary** includes a list of frequently used terms, acronyms, and abbreviations that appear in this guide.
-

Related Information

Related Documents and Software CD-ROM

The *DACS II AX 4/11 Release 10.0 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 (order number 109068841).

SMC I

The SMC I is not supported by Release 10.0 and will not be supported in later releases. For information on the SMC I, refer to *DACS II AX 4/11 Release 9.02 User's Guide* (365-359-206).

Training Course

TR3530, DACS II AX 4/11 Operations and Maintenance is a 3-day training course for the DACS II AX. It is delivered in the Lucent Technologies training facility in Florida and can be delivered at customer locations.

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/>

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.

T1 and DS1 appear in the text and on screens interchangeably. DS3 and T3 also are used interchangeably.

Screens

In this manual, screens appear as they do for a user with an Administrator security level. Users with View-only, Test, or Provisioning security levels may see a restricted set of menus, fields, and commands.

Overview

1

Contents

■ DACS II AX Models	1-3
Overview	1-3
DACs II AX 11	1-4
DACs II AX 4	1-5
■ N+1 Protection Switch	1-6
Overview	1-6
N + 1 Protection Switch Controller Card	1-7
Ready LED	1-7
■ System Manager Controller Card	1-8
Overview	1-8
Redundant System Manager Controllers	1-8
Features	1-8
■ System Manager Controller Card	1-9
SMC II Diagram	1-9
SMC II LEDs	1-10
SMC II Connectors	1-10
■ Redundant Power Supplies	1-11
DACs II AX	1-11
N+1 Protection Switch	1-11

■ Application/Interface Module Sets	<u>1-12</u>
Overview	<u>1-12</u>
■ Equipment Specifications	<u>1-14</u>
Module Sets	<u>1-14</u>
DACS II AX Units	<u>1-17</u>
Fuse Requirements	<u>1-18</u>
■ Technical Support	<u>1-19</u>
Telephone Numbers	<u>1-19</u>

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 Card

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

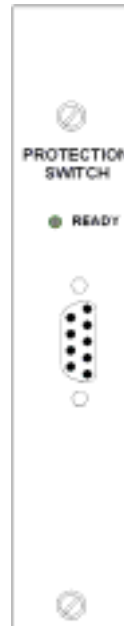


Figure 1-4. N+1 Protection Switch Controller Card

Ready LED

The **READY** LED on the Protection Switch Controller card 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 Controller Card

Overview

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

Redundant System Manager Controllers

Both the DACS II AX 11 and the DACS II AX 4 can be equipped with two System Manager Controller 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 Controller card via a pair of communication buses on the DACS II AX mid-plane. The standby System Manager Controller card will automatically assume control if the primary System Manager Controller card fails.

Features

The System Manager Controller card has these features:

- A microprocessor
- Controls all Application Module Sets and System Timing
- 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 Controller cards resident in the system, including cross-connect data and software updates
- Provides 20 user logins
- Controls SNMP Traps & Alarm Events.

System Manager Controller Card

SMC II Diagram [Figure 1-5](#) shows the half-height front card (left) and full-size rear card (right) of the SMC II.

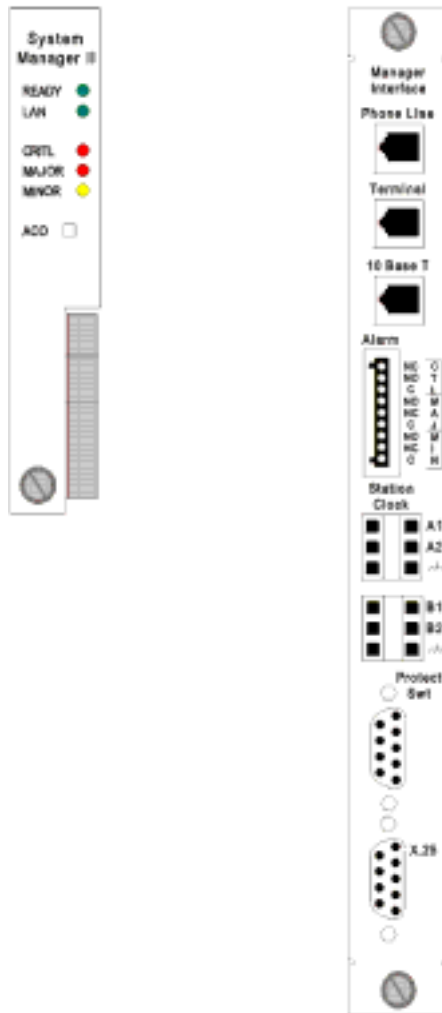


Figure 1-5. SMC II Front and Rear Cards

System Manager Controller Card (Continued)

SMC II LEDs The SMC II front card is a half-size card with the following LED indicators and push button:

Indicator	Color	Description
READY	Solid Green	Indicates that the SMC is on-line.
	Flashing Green	SMC is in standby state, waiting to go "online" should the other SMC fail.
	Solid Red	SMC is malfunctioning.
LAN	Flashing Green	Data is being forwarded to/from the LAN port.
CRITL	Solid Red	Critical alarm is present.
MAJOR	Solid Red	Major alarm is present.
MINOR	Solid Yellow	Minor alarm is present.
ACO (Alarm Cut Off)	--	Momentary alarm reset push button.

SMC II Connectors The SMC II rear interface is a full-size card with the following connections:

Label	Description
Phone Line	A phone line port. It provides an RJ11 Telco port for integral modem connection.
Terminal	A console port. It provides an RJ11 Telco port for direct terminal connection.
10 Base T	An Ethernet LAN port. It provides an RJ45 modular 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.
Protection Swt	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

DACS II AX

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.

N+1 Protection Switch

The N+1 Protection Switch has two slots for the DC Redundant Power Supply.

The DC Power Supply is -48 Vdc +/- 10%. Max. 48 W, 1.2 A.

Terminal blocks are used for DC. A green LED indicates that the power supply is working. The N+1 Protection Switch does not support AC.

Fuse requirements are listed in [Table 1-3](#).

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 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 containing 28 virtual tributary (VT) 1.5s per Bellcore GR-253. Supports D4, ESF framing, diagnostics, and performance monitoring. 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 DS1 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
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.
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 High Speed Data	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.
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.
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.
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.

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 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 Bus 168 Equivalent DS-1s (or 6 DS-3s) Next Gen Bus (future)	Non-Blocking 256 Mbps TDM Bus 168 Equivalent DS-1s Next Gen Bus (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, FCC, and EMC testing	CE, UL, CUL, FCC, and EMC testing
Module-Level Approvals *	NEBS (Level 3), CE, UL, CUL, and FCC	NEBS (Level 3), CE, UL, CUL, and FCC
N+1 Protection Switch	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. 48 W, 1.2 A Temperature: 0 °C (32°F) - 50°C (122°F) Humidity: 0% to 90% (non-condensing)	Not Applicable (N/A)
* For details, consult Lucent Technologies representative.		

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

For technical assistance in Europe, 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.**

Contents

■ Background	2-3
■ Site Preparations	2-4
Equipment Inspection	2-4
Transmission Equipment	2-4
Required Tools and Supplies	2-4
■ Rack Mounting Procedures	2-5
DACS II AX-11 Flush Mounted into a 19" Rack (standard)	2-5
DACS II AX-11 Flush Mounted into a 23" Rack	2-6
DACS II AX-11 Center Mounted into a 23" Rack	2-7
DACS II AX-4 into a Flush Mounted 19" Rack	2-8
■ Proper Grounding	2-9
■ Removing Power Supply Module(s)	2-10
■ Fuse/Wattage Requirements	2-11
Fuse Requirements	2-11
■ Installing the Power Supply Module(s)	2-12
DACS II AX-11 AC Power	2-12
DACS II AX-11 DC Power (48VDC)	2-13
DACS II AX-4 AC Power	2-14
DACS II AX-4 DC Power (24VDC and 48VDC)	2-15

- Connecting the Talk Battery (For Octal Voice Module only) [2-16](#)
- Installing the System Manager Controller II Modules [2-17](#)
 - Procedure - Install SMC II (DACS II AX-11) [2-18](#)
 - Procedure - Install SMC II (DACS II AX-4) [2-18](#)
- Installing the Application and Interface Modules [2-19](#)
 - Install Application Module [2-20](#)
- Installing the N+1 Protection Switch [2-21](#)
 - Before You Begin [2-21](#)
 - Procedure - Install N+1 Protection Switch [2-21](#)
 - For Octal T1/E1 Connections [2-22](#)
 - For Broadband Connections (DS-3, Hybrid DS-3, or STS-1) [2-22](#)
- Connecting the Protection Switch Controller Card [2-24](#)
 - Before You Begin [2-24](#)
 - Procedure [2-25](#)
- Console Access [2-26](#)
 - Connecting the Console [2-26](#)
 - Terminal Communications Parameters [2-27](#)
 - Telnet Session Timeout [2-27](#)
- Logging into the DACS II AX [2-28](#)
- Verifying N+1 Protection Switch Installation [2-29](#)
 - Before You Begin [2-29](#)
 - Procedure [2-29](#)
- Menu Navigation [2-31](#)
- Help <?>Menu [2-32](#)
- DACS II AX Menu Structure [2-33](#)
- Set Up and Maintenance Activities [2-42](#)

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 a 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](#).

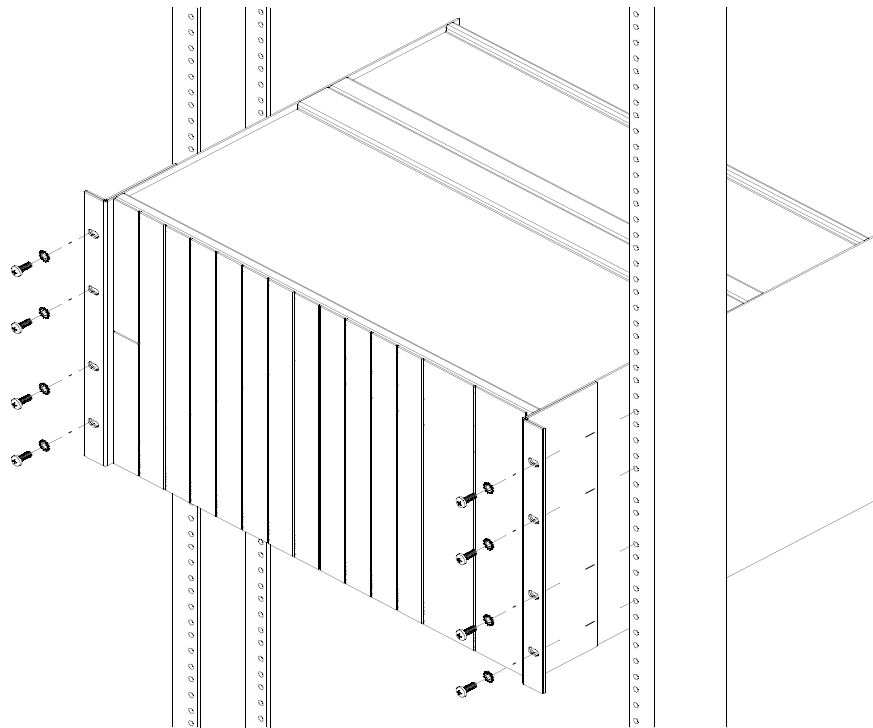


Figure 2-1. DACS II AX-11 Rack Mounting

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.

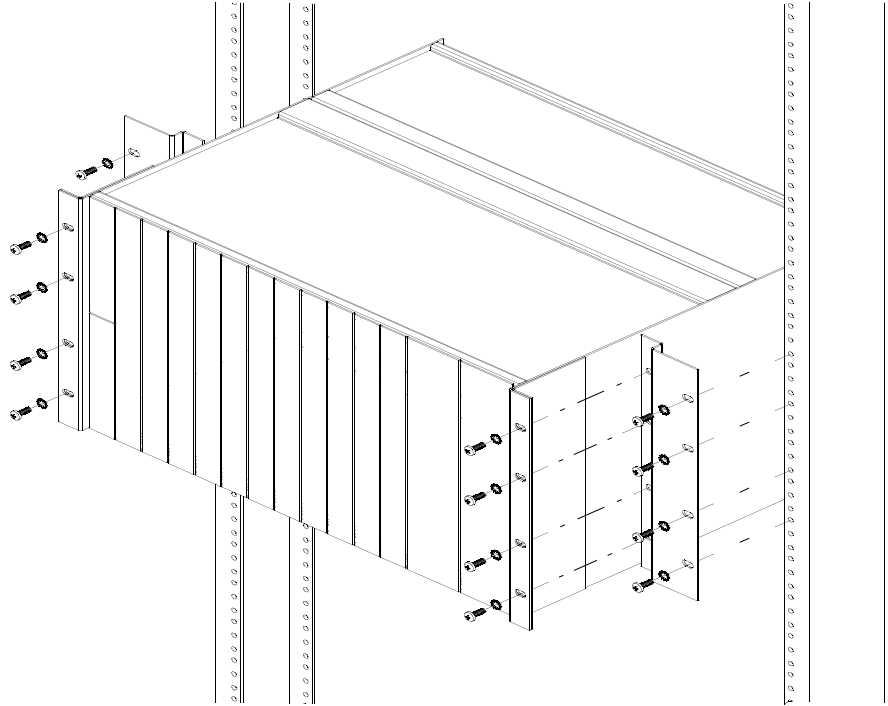


Figure 2-2. DACS II AX-11 Flush Rack Mounting

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.

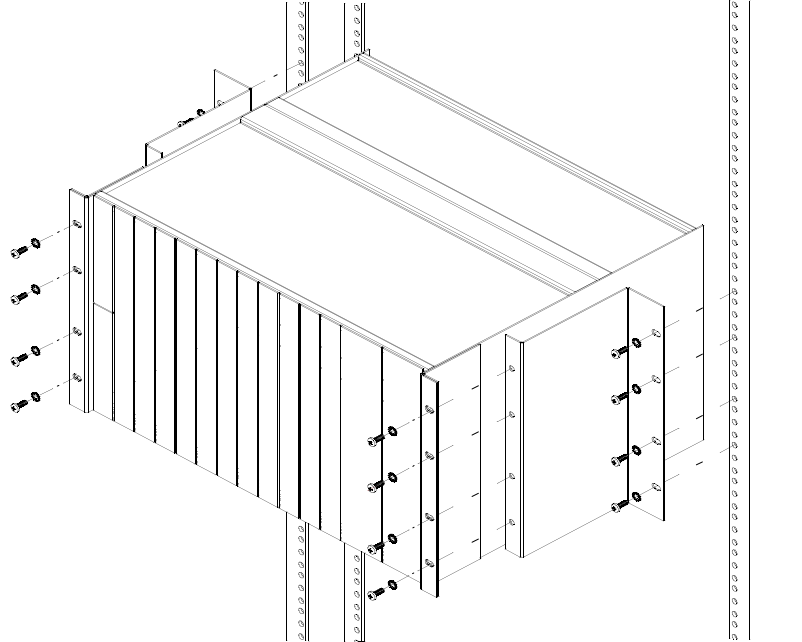


Figure 2-3. DACS II AX-11 Center Rack Mounting

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.

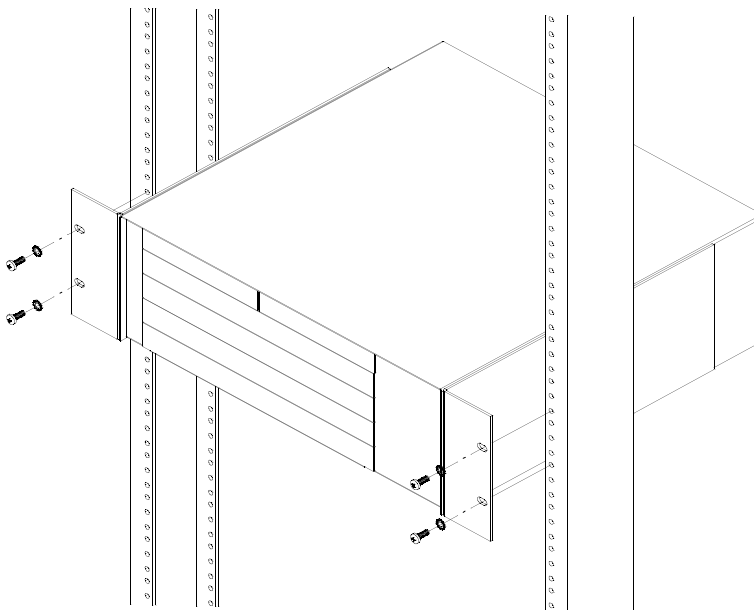


Figure 2-4. DACS II AX-4 Rack Mounting

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](#).

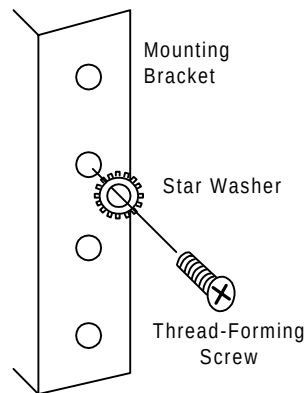


Figure 2-5. Thread-forming Screws and Star Washer Needed for Grounding

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.

Fuse/Wattage Requirements

Fuse Requirements

[Table 2-1](#) summarizes fuse requirements for the DACS II AX.

Table 2-1. 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

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.

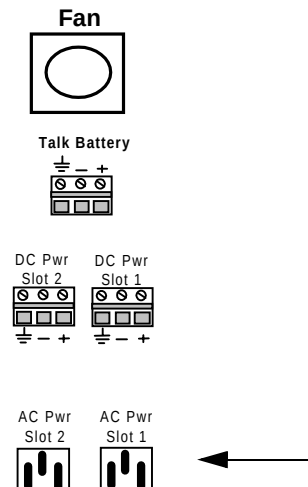


Figure 2-6. DACS II AX 11 AC Power Connection

**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.

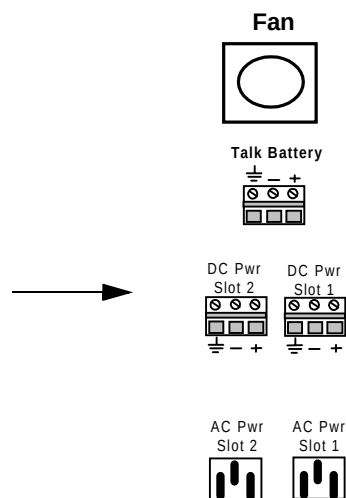


Figure 2-7. DACS II AX 11 DC Power Connection

**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.

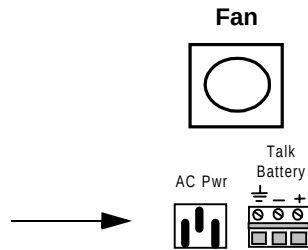


Figure 2-8. DACS II AX-4 AC Power Connection

**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.

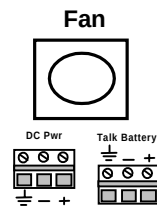


Figure 2-9. DACS II AX-4 DC Power Connection

Connecting the Talk Battery (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.

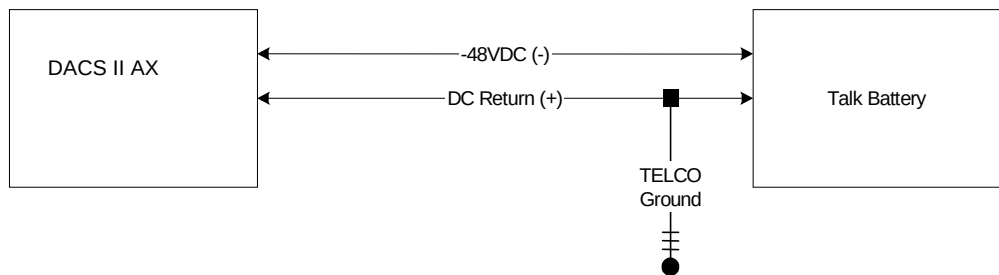


Figure 2-10. Talk Battery Connections

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

Installing the System Manager Controller II Modules

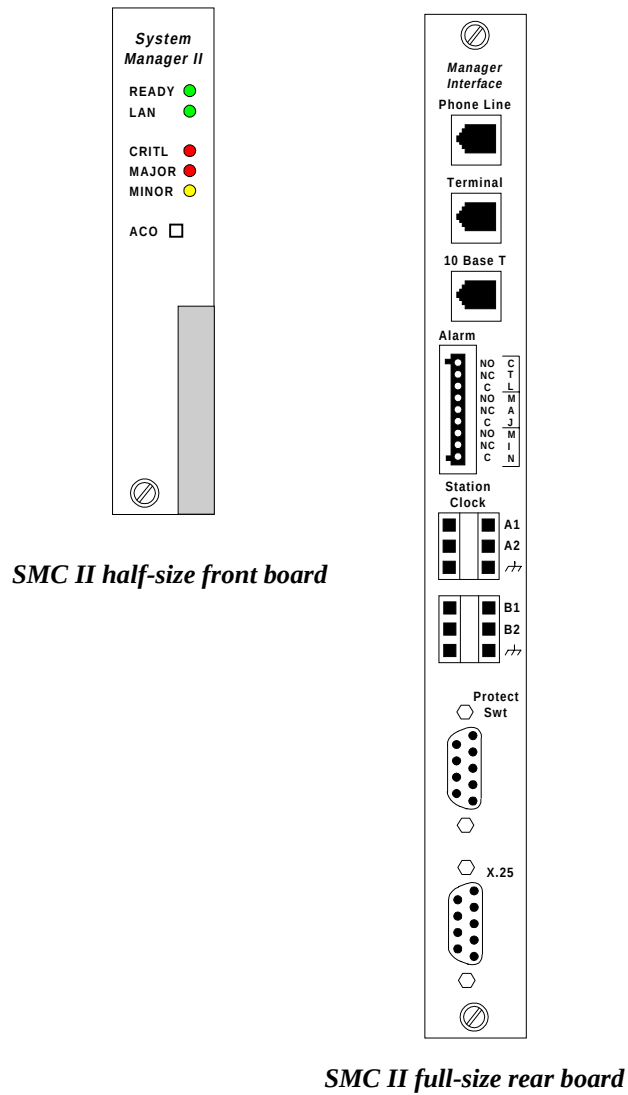


Figure 2-11. SMC II Front and Rear Boards

**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 2-12. 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 2-13. 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.

Plan the slot assignments for the redundancy groups. For details, refer to [PSX 5300 - Slot Assignments](#) and [PSX 5200 - Slot Assignments](#) in Chapter 10.

Procedure - Install N+1 Protection Switch

To install the N+1 Protection Switch, follow these steps:

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 Rear Interface Cards in the DACS II AX 11.

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, Hybrid DS-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

Before You Begin There are two revisions of the Protection Switch Controller Card. Both revisions can be used in either the PSX 5200 or the PSX 5300.

The Rev 1 controller module is designed for the PSX 5300. It can also be used in the older PSX 5200.

The Rev 0 controller module was originally designed for the PSX 5200. It can also be installed in the PSX 5300, and will support the two broadband groups when installed with the PSX 2.0 software.

Both Protection Switch Controller cards look like the one shown in [Figure 2-14](#).

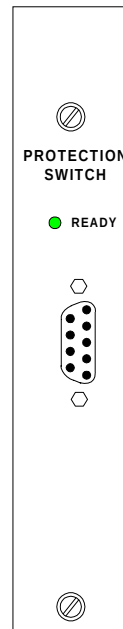


Figure 2-14. N+1 Protection Switch Controller Card

Procedure

To install the N+1 Protection Switch Controller Card, follow these steps:

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 2-14](#).
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, [Interfaces and Cables](#).

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.

If	Then
an asynchronous terminal (or pc with VT-100 emulation) will be directly connected to the DACS II AX	Attach your terminal to the RJ-11 craft interface connector labeled TERM.
a PC or workstation in the network will dial in to the DACS II AX	Put a phone line in the RJ-11 telco connector labeled PHONE LINE. 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 10BaseT Ethernet connector on the DACS II AX System Manager interface. The Administrator establishes a telnet session to connect to the DACS II AX. Available after installation.

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.

Telnet Session Timeout

An idle telnet session will automatically timeout. To turn off the automatic timeout feature, press **CTRL z** after you log in to the DACS II AX using telnet.

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, Dec 22, 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 2-15. Terminal Selection Type

Verifying N+1 Protection Switch Installation

Before You Begin For information on menu navigation, refer to [Menu Navigation](#).

Procedure To ensure the N+1 Protection Switch has been properly installed:

1. From the DACS II AX Main Menu, select *System Configuration*, then select *Node Profile*. Verify that the N+1 Chassis Type field and other settings are correct. For information on the Node Profile, refer to [Verify Node Profile Settings: page 10-22](#).
2. From the DACS II AX Main Menu, select *Node Summary* move the cursor to the PSX and press **<Enter>**. From the PSX Main Menu, select *Status*.
3. Verify that the **Card Status** is *Ok* and the **Switch State** condition is *Normal*.

The N+1 Protection Switch's Status Menu should look similar to the one shown in [Figure 2-16](#).

Lucent Technologies

DACS II AX - Protection Switch

Help = [?]

Status Menu

Slot#	Card Type	Card Status	Switch State	Switch Status

01	Narrowband Redundant	Ok	Normal	Ok
02	Narrowband Primary	Ok	Normal	Ok
03	Narrowband Primary	Ok	Normal	Ok
04	Narrowband Primary	Ok	Normal	Ok
05	Narrowband Primary	Ok	Normal	Ok
06	Broadband '2' Primary	Ok	Normal	Ok
07	Broadband '2' Redundant	Ok	Normal	Ok
08	Broadband '1' Primary	Ok	Normal	Ok
09	Broadband '1' Primary	Ok	Normal	Ok
10	Broadband '1' Primary	Ok	Normal	Ok
11	Broadband '1' Redundant	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 2-16. N+1 Protection Switch Status Menu

4. To display additional information about the Protection Switch, return to the Node Summary and press **E**. For more information, see [N+1 Protection Switch Alarms](#) in Chapter 10.

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 2-17. The Help Menu

DACS II AX Menu Structure

The console enables access to a hierarchy of menus. This section briefly describes each menu. [Figure 2-18](#) shows the entire menu structure of the DACS II AX user interface.

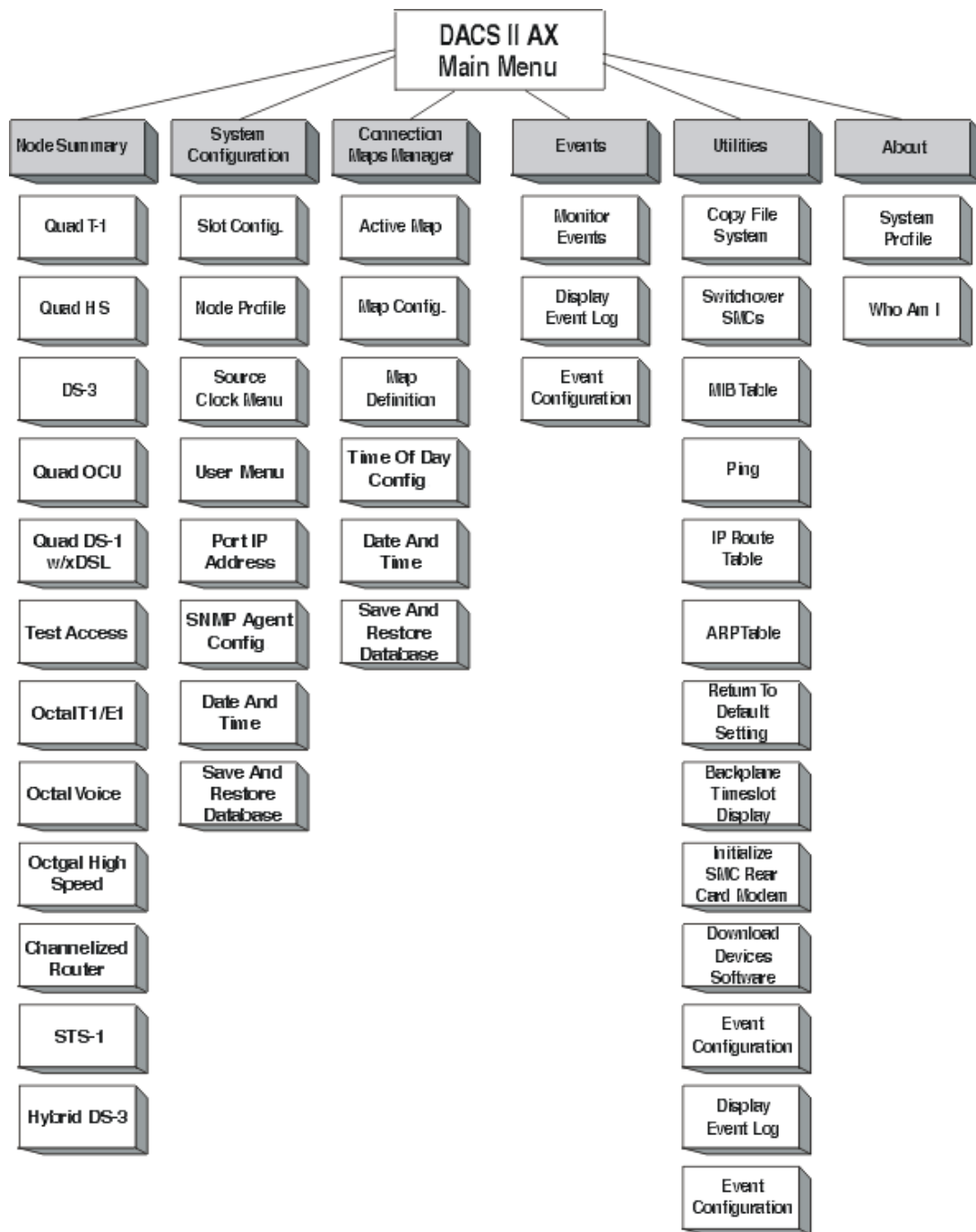


Figure 2-18. DACS II AX Menu Structure

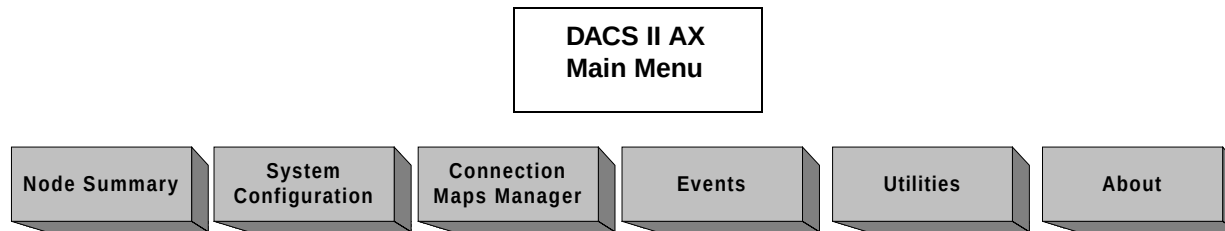


Figure 2-19. Main Menu Structure

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.

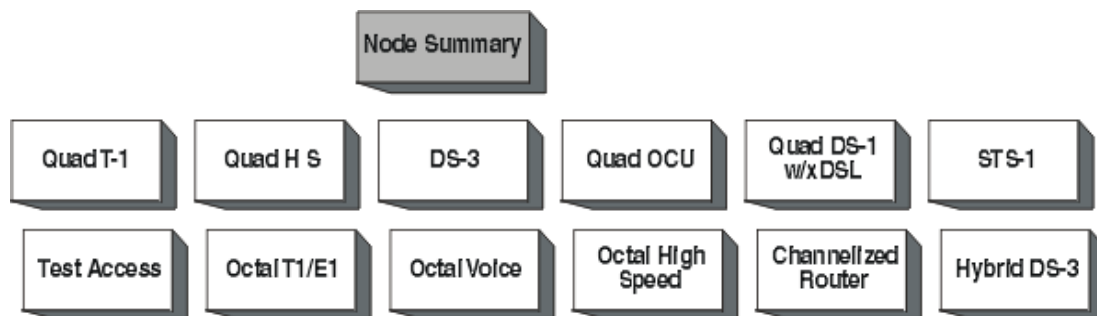


Figure 2-20. Node Summary Menu Structure

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.

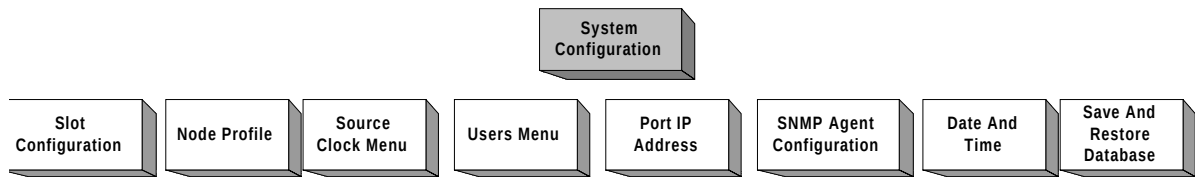


Figure 2-21. System Configuration Menu Structure

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.

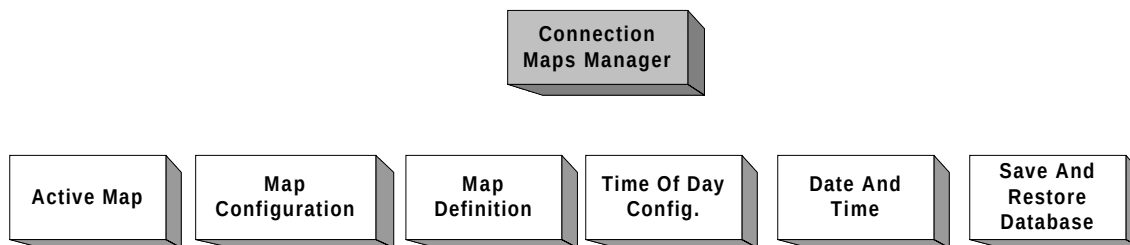


Figure 2-22. Connections Map Manager Menu Structure

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.

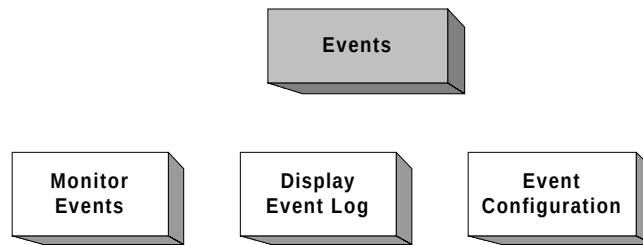


Figure 2-23. Events Menu Structure

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.

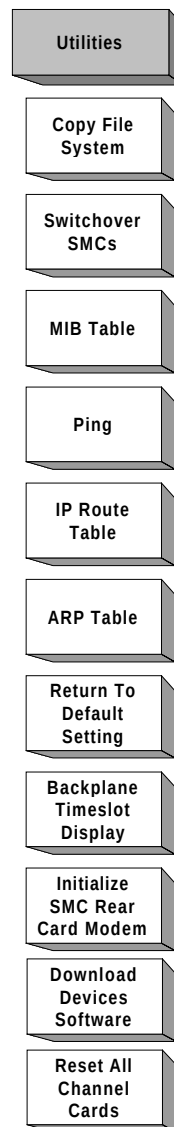


Figure 2-24. Utilities Menu Structure

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.

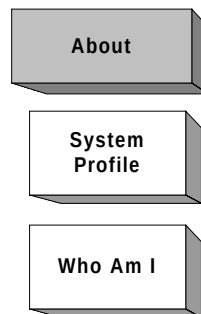


Figure 2-25. About Menu Structure

The ***About Menu*** provides two options:

- System Profile displays identification information about the software version running on the SMC.
 - Who Am I allows you to display login information for the current session.
-

Set Up and Maintenance Activities

ACTIVITY	DESCRIPTION	CHAPTER
Define users (optional)	To set up multiple logins to the DACS II AX. Note: <i>The first login created must be the system administrator's login with an ADMIN security level.</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, 9
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

Contents

■ Terms Used	3-3
■ Node Summary Menu	3-4
Functions	3-4
■ Parts of the Node Summary Menu	3-5
N+1 Group	3-5
Configured Device Type	3-5
Device State	3-6
Device State (Continued)	3-7
Alarms	3-7
SMCA and SMCB	3-8
PSX - Protection Switch	3-8
■ Actions from the Node Summary Menu	3-9
Clear Error Counts	3-9
Slot Configuration	3-10
Port/Link Configuration	3-10
Displaying Alarm Information	3-11
Procedure - Displaying Alarm Information for a Module	3-11
Displaying Alarm Information for the N+1 Protection Switch	3-12
Displaying Alarm Information for an SMC	3-13

Toggle Alarm Contacts	<u>3-14</u>
Alarm Contact Type	<u>3-14</u>
Switchover	<u>3-14</u>
N+1 Redundancy Restore	<u>3-14</u>
Expose Protection Switch Detail	<u>3-14</u>

Terms Used

Controller Card - provides communications between the SMC II in the DACS II AX 11 and the N+1 Protection Switch.

Primary Device - a device in a 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 5200 - N+1 Protection Switch that supports one narrowband and one broadband group.

PSX 5300 - N+1 Protection Switch that supports one narrowband and two broadband groups.

Redundant Device - one device in a 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 one redundant device.

Restore - an action that the user initiates to return traffic to a primary device that was being protected by a redundant device in the same redundancy group.

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, alarm contacts, 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              Alarm Contact Type...: Standard

                                Node Summary Menu

      N+1
Slot#  Group  Configured Type  Device State  Alarm
-----
01     Nb    + Octal T1/E1     Online       None       Clock Src
02     Nb    - Octal T1/E1     Standby      Major
03     Nb    + Octal T1/E1     Online       *None
04     Nb    + Octal T1/E1     Online       None
05     Nb    + Octal T1/E1     Online       None
06     Bb-2  + Hybrid DS3      Online       None
07     Bb-2  + Hybrid DS3      Standby      None
08     Bb-1  + STS-1           Online       None
09     Bb-1  + STS-1           Online       None
10     Bb-1  + STS-1           Online       None
11     Bb-1  + STS-1           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 [P]ort/Link Cfg [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver [R]estore [E]xpose
  
```

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

Parts of the Node Summary Menu

N+1 Group

The *N+1 Group* column on the *Node Summary* screen displays:

- the module's redundancy group: Nb = Narrowband, Bb-2 = Broadband Group 2, and Bb-1 = Broadband Group 1.
- the protection status of the module with a plus (+) or minus (-) sign
(+) The plus sign indicates that the slot has redundancy enabled, the *Configured Type* is correct, the redundancy group has a configured and *enabled* redundant device, and the N+1 Protection Switch is *Online*.
(-) indicates a protected card has switched over to the redundant device. When a primary card switches over to the redundant device, the primary card will have a Major alarm, as shown in [Figure 3-1](#), slots 1 and 2.

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 a redundancy group can be found in Chapter 10, *N+1 Protection Switch*.

Parts of the Node Summary Menu (Continued)

Device State

The state of a card is indicated in the Device State column. If the card is configured as a **primary device** in a 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.



NOTE:

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

If the card is a **redundant device** in a redundancy group, the state of the redundant card 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.

Parts of the Node Summary Menu (Continued)

Device State (Continued)

- **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.

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**. For 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 is 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). 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.

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**. As long as errors are occurring, the asterisk will appear on the screen.

[Figure 3-2](#) shows an asterisk for Slot 3.

Press **C** to clear all error counts. The following message appears: *This will clear all error counts on all devices. Continue, are you sure (Y/N)?* Press **Y**.

```

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

                                Node Summary Menu

  Slot#  N+1  Group  Configured Type  Device State  Alarm
  -----
01      Nb  + Octal T1/E1  Standby      None
02      Nb  + Octal T1/E1  Online       None      Clock Src
03      Nb  + Octal T1/E1  Online       *None
04      Nb  + Octal T1/E1  Online       None
05      Nb  + Octal T1/E1  Online       None
06      Bb-2 + Hybrid DS3  Online       None
07      Bb-2 + Hybrid DS3  Standby      None
08      Bb-1 + STS-1       Online       None
09      Bb-1 + STS-1       Online       None
10      Bb-1 + STS-1       Online       None
11      Bb-1 + STS-1       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 [P]ort/Link Cfg [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver [R]estore [E]xpose
  
```

Figure 3-2. Asterisk shown in slot 3 indicating an error condition

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. See [Configuring a Slot](#) for details.

Port/Link Configuration

The ports and links on the application modules can be configured from the Node Summary Menu and from the Slot Configuration Menu. Type **P** for [P]ort/Link Cfg. The card's Configuration Menu displays. Refer to the application module chapters for information on configuring ports/links.

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: DS3                      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 3-3. Device card alarm information exposed from Node Summary

Actions from the Node Summary Menu (Continued)

Displaying Alarm Information for the N+1 Protection Switch

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

1. From the Main Menu, select *Node Summary*.
2. Move the cursor to the PSX, then press **E**. A screen similar to the one shown in [Figure 3-4](#) appears:

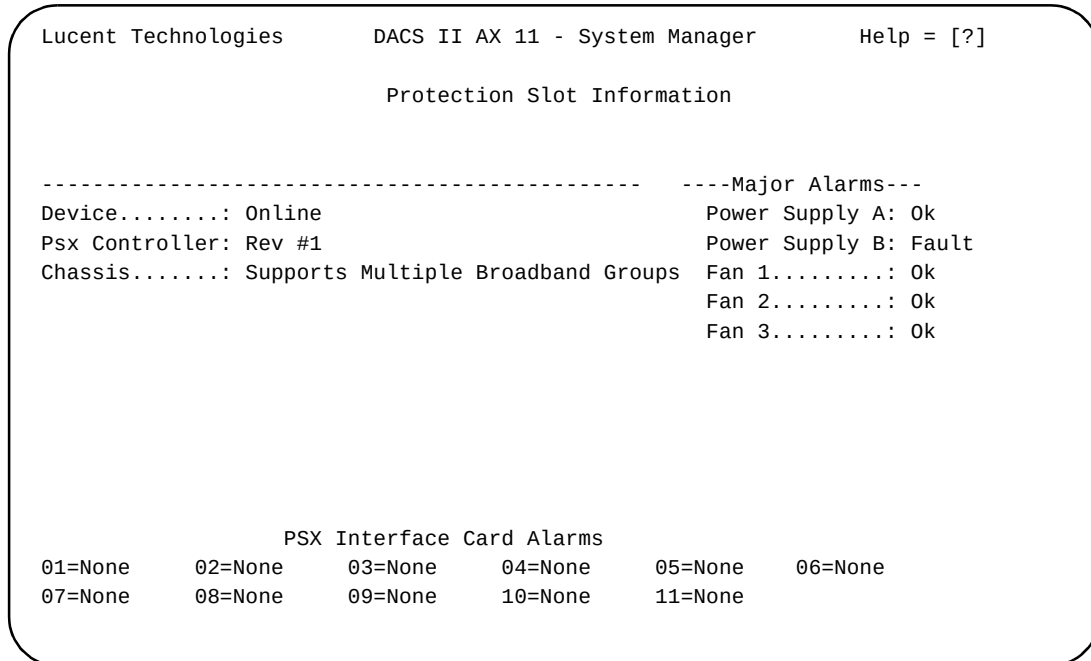


Figure 3-4. N+1 Protection Switch alarm information exposed

For more information on this screen, refer to [N+1 Protection Switch Alarms](#) in Chapter 10.

Actions from the Node Summary Menu (Continued)

Displaying Alarm Information for an SMC

To expose an alarm in one of the SMC slots:

1. From the DACS II AX Main Menu, select *Node Summary*.
2. Then move the 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 3-5](#) appears:

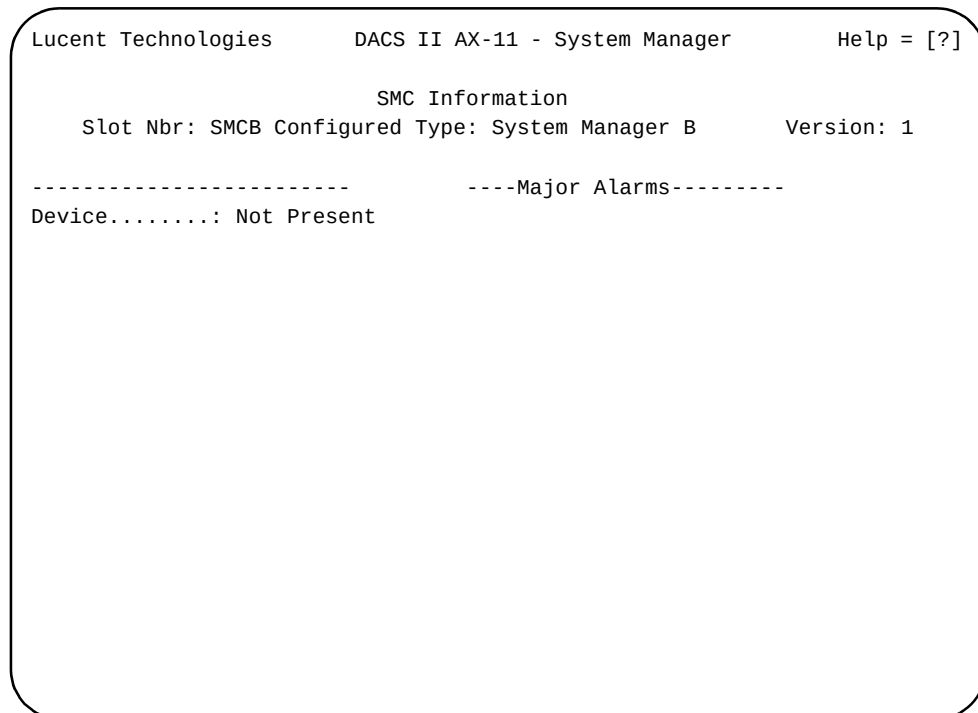


Figure 3-5. SMC alarm information exposed

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, type **T** to 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.

The Alarm Contacts field in the upper left corner of the Node Summary Menu, displays either Enabled or Disabled.

Alarm Contact Type

In the upper right corner of the Node Summary, the setting for the configuration of the SMC II alarm contacts is displayed. Possible values are Standard or Local Audio. The Alarm Contact Type is set on the Node Profile menu. For details, see [Node Profile Submenu](#) in Chapter 4.

Switchover

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

N+1 Redundancy Restore

The Restore action on the Node Summary returns traffic to a primary device that was offline and being protected by a redundant device.

To restore a device, position the cursor on the slot to be restored and type **R**. If the selected device can not be restored, an error message appears.

Expose Protection Switch Detail

On the Node Summary, move the cursor to the PSX and type **E** to display revision levels and alarm information on the Protection Switch.

Contents

■ Background	4-5
Purpose	4-5
Objectives	4-5
Related Information	4-5
■ System Configuration Submenu	4-6
Menu Options	4-6
Functions	4-7
■ Configuring a Slot	4-8
Purpose	4-8
Related information	4-8
Procedure	4-8
Slot Configuration Field Descriptions	4-10
■ Deleting Slot Contents	4-11
Procedure - Deleting Slot Contents	4-11
■ Configuring Ports and Links	4-12
Description	4-12
Before you Begin	4-12
Related Task	4-12
Procedure	4-12

■ Node Profile Submenu	4-13
Purpose	4-13
Before You Begin	4-13
Procedure	4-13
Node Profile Field Descriptions	4-14
■ Source Clock Submenu	4-15
Purpose	4-15
Procedure	4-15
Source Clock Field Descriptions	4-16
■ Administering Users	4-17
Description	4-17
Retrieving Personal Security Information	4-17
■ User Profile Manager Menu	4-18
Purpose	4-18
■ Adding a User	4-19
Description	4-19
Procedure	4-19
Fields on the User Configuration Menu	4-20
■ Changing User Information	4-21
Description	4-21
Procedure	4-21
■ Deleting a User	4-22
Procedure	4-22
■ Configuring the DACS II AX IP Address	4-23
Purpose	4-23
Procedure	4-23
Fields	4-24
■ Configuring the SNMP Agent	4-25
Purpose	4-25
Before you begin	4-25
Procedure	4-25
SNMP Agent /Client Profiles Field Descriptions	4-27
■ Setting the Current Date and Time	4-29
Description	4-29
Procedure	4-29
Fields	4-30

■ Save and Restore Database	<u>4-31</u>
Description	<u>4-31</u>
■ Saving the AX's Configuration Data to a Host	<u>4-32</u>
Description	<u>4-32</u>
Procedure	<u>4-32</u>
■ Restoring the AX's Configuration Data from a Host	<u>4-34</u>
Description	<u>4-34</u>
Procedure	<u>4-34</u>
■ Fields for Save and Restore Database	<u>4-36</u>
Save and Restore Database Fields	<u>4-36</u>
■ SMC User Security System Summary	<u>4-37</u>
SMC User Security Chart	<u>4-37</u>

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.

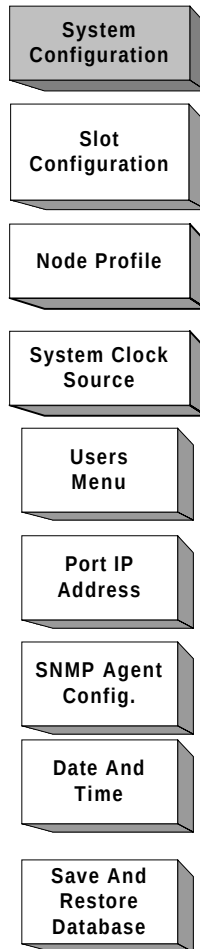


Figure 4-1. System Configuration Menu Options

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.

Configuring a Slot

Purpose Each of the modules in the DACS II AX need to be identified using the Slot Configuration Menu. This menu displays 4 or 11 slots, according to the number of slots in the DACS II AX chassis.

Related information Module redundancy is described in Chapter 10, N+1 Protection Switch.

Procedure To add or change a slot configuration:

1. Access the Slot Configuration Menu. From the *DACS II AX Main Menu* you can either:
 - Select *System Configuration*, then select *Slot Configuration*.
 - or select *Node Summary*, then type **S** for **[S]lot Cfg**.

The Slot Configuration Menu displays.

Lucent Technologies

DACS II AX 11 - System Manager

Help = [?]

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1	Redundant1	Enable
2	Octal T1/E1	BERT test	Enable
3	Octal T1/E1	Loop One	Enable
4	Octal T1/E1	Loop Two	Enable
5	Octal T1/E1	Loop Three	Enable
6	Hybrid DS-3	Loop Four	Enable
7	Hybrid DS-3	Redundant7	Enable
8	STS-1	Primary S8	Enable
9	STS-1	Primary S9	Enable
10	STS-1	Primary S10	Enable
11	STS-1	Redundant11	Enable

N+1 Redundancy:

Enable

N+1 Redundancy Switchover:

Automatic

N+1 Redundancy Restore:

Manual

Change Card = [Enter key]

[D]elete Card

[P]ort/Link Cfg

Figure 4-2. Slot Configuration Menu

2. Move the cursor to the slot to be configured and press **<Enter>**. The Slot Configuration screen displays. [Figure 4-3](#) shows the Slot Configuration screen for an empty slot.

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, DS-3, STS-1, or Hybrid DS-3 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*.

**Slot Configuration
Field Descriptions**

Slot Name: *(text field)*. Specify a name for the slot, up to 11 alphanumeric characters.

Card Type: *(option field)*. Select a card type: (example - Octal Voice).

Redundancy: *(option field)*. Select *Enable* to put an Octal T1/E1, DS3, STS1, or Hybrid DS3 module in a redundancy group.

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



WARNING:

When a card is deleted, all existing cross-connections to that card are also deleted from the Active Map.

To delete a card from a slot:

1. Remove the card from the slot.
2. Access the *Slot Configuration Menu*. From the *DACS II AX Main Menu* you can either:
 - Select *System Configuration*, then select *Slot Configuration*.
 - or select *Node Summary*, then type **S** for **[S]lot Cfg**.
3. Go to the Slot # where the card was located, then type **D**.

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.



NOTE:

If you do not remove the card from the chassis before pressing **D**, you receive an error message: -ALERT!- Can not delete a device that is present.

Configuring Ports and Links

Description Each port on the rear interface of each module has associated communications characteristics. In addition, if the module has embedded links, such as the Hybrid DS-3 module has T1/E1 links, the links have communications characteristics also. The **[P]ort/Link Cfg** action enables you to identify these port and link characteristics.

Before you Begin Before configuring ports and links, the slot must be configured. See [Configuring a Slot: page 4-8](#).

Ports and links on redundant cards cannot be configured. Redundant cards get their configuration information from the card that is being protected.

Related Task Port and link configurations can be displayed from the application module's main menu. To change the port and link configuration, use the **[P]ort/Link Cfg** command.

Procedure There are three ways to access the **[P]ort/Link Cfg** command. From the *DACS II AX Main Menu* you can do any of the following:

1. Select *System Configuration*, then select *Slot Configuration*. Move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
3. Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

A Configuration Menu for the selected module appears.

4. Configure the module as described in the related application module chapter located in Chapters 11 through 22 of this manual.
-

Node Profile Submenu

- Purpose** Use Node Profile to identify hardware and redundancy information for this node and assign a name to the DACS II AX system. The system name will appear on the *DACS II AX Main Menu*.
- Before You Begin** It is important to accurately enter the hardware configuration on the *Node Profile Menu*. A *Critical* alarm may be generated if the equipment is improperly identified.
- Procedure**
1. Select *System Configuration* from the *DACS II AX Main Menu*. Select *Node Profile*.
 2. Specify options. See [Node Profile Field Descriptions](#).
 3. Type **X**. Confirm action when prompted, by pressing **Y**. Changes are saved and you return to the previous menu. [Figure 4-4](#) shows a completed Node Profile menu for a node that has two broadband and a narrowband protection group. If the node does not support redundancy or it does not support two broadband groups, some fields will not appear on the Node Profile menu.

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

Node Profile Menu

Node name: default node name

Dual System Mgr.....: Yes
Alarm Contact Type.....: Standard

N+1 Redundancy Node.....: Yes
N+1 Chassis Type.....: 5300
Protection Switch Dual Power.....: No
N+1 Redundancy Narrowband Group.....: Octal T1/E1
N+1 Redundancy Broadband Group 1.....: DS3
Protection Switch Dual Broadband Groups: Yes
N+1 Redundancy Broadband Group 2.....: STS1

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.

Dual System Mgr (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**. If you do not have a second SMC, 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.

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**. If you do not have redundancy, set this field to **No** or else a *Critical Alarm* will be triggered. If you select **No**, no other fields appear on this menu.

N+1 Chassis Type (option field) This field appears if **Yes** is selected in the N+1 Redundancy Node field. Select **5200** or **5300**. If the redundancy chassis is improperly identified, you will receive *Critical* alarms.

Protection Switch Dual Power (option field) Select **Yes** or **No**. Yes confirms that you have two power supplies in the protection switch. The default setting is **Yes**.

If	And, you incorrectly set	Then
You do NOT have a second power supply	Protection Switch Dual Power to Yes	Critical Alarm will result
You DO have a second power supply	Protection Switch Dual Power to No	You will get an SNMP trap, but no alarm.

N+1 Redundancy Narrowband Group (display field) This field automatically displays Octal T1/E1 as the supported narrowband group.

N+1 Redundancy Broadband Group 1 (option field) If you are using broadband group 1(slots 8-10, with 11 for the redundant module), indicate which type of broadband modules will be protected: DS3, HDS-3, or STS1.

Protection Switch Dual Broadband Groups (option field) Select **Yes** or **No**. If you select **No**, no other fields appear on the Node Profile Menu.

N+1 Redundancy Broadband Group 2 (option field) If you are using broadband group 2 (slots 1-6, with 7 for the redundant module), indicate which type of broadband modules will be protected: DS3, HDS-3, or STS1.

Source Clock Submenu

Purpose 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. The clock source may be generated by the DACS II AX, other network equipment, or provided by a stand-alone timing signal generator. For details, see [Chapter 8, Clocking](#).

- Procedure**
1. From the *DACS II AX Main Menu*, select *System Configuration*.
 2. Select *System Source Clock*. The *System Clock Source Menu* displays.

The screenshot shows a terminal window titled "Lucent Technologies DACS II AX 11 - System Manager Help = [?]". The main title is "System Clock Source Menu". The interface displays the following configuration:

Mode.....:	Auto	
Primary....:	Station Clk A	Port: NA
Secondary...:	02 -	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 indicate *Auto*, *Primary*, *Secondary*, or *Tertiary* mode, you will also need to specify the timing sources. Go to step 4.
If you are indicating Free Run mode, skip to step 5.
4. Choose a slot and port number to use line timing as the clock source, choose Station Clock A or B if you are using an external station clock (BITS clock) input, or set to *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.

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, Secondary, Tertiary: (Option fields) Choose a slot and port number to utilize line timing as the clock source, choose Station Clock A or B if you are using an external station clock (BITS clock) input, or set to *Not Configured*.

Active: (Display field) 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 *DACS II AX Main Menu*, select *About*, then select *Who Am I*.
2. Provide the password for the current session and type **X** to execute the query.

The DACS II 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 *DACS II AX Main Menu*, select *System Configuration*, then select *Users Menu*. The Users Profile Manager Menu displays ([Figure 4-6](#)).

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

Users Profile Manager Menu

Name	Id	Rights	Status	Name	Id	Rights	Status
view	V/O	View Only					
test	T/L	Test					
prov	P/L	Provision					
admin	A/L	Admin	Logged In				

[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 *DACS II 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](#)).

The screenshot shows a terminal window titled "Lucent Technologies" and "DACS II AX 11 - System Manager" with a "Help = [?]" option in the top right. The main menu is titled "User Configuration Menu". It lists several fields for input: "Name.....:", "Audit trail identifier.....:", "Contact.....:", "Password (at least 6 char).:", "Confirm password.....:", and "Security level.....: View Only".

Figure 4-7. User Configuration Menu

3. Enter a Name, Audit trail identifier, contact, 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

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.

Contact: (Text field) Enter contact information for this user. Enter up to 31 alphanumeric characters.

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 *DACS II 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**.

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**.

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

Configuring the DACS II AX IP Address

Purpose The Port IP Addresses option on the System Configuration menu is used to identify the IP address of the DACS II AX. 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 *DACS II AX Main Menu*, select *System Configuration*, then select *Port IP Addresses*.

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.....: 0.0.0.0  
  
      Enable RIP.....: No  
      Default gateway (if RIP disabled): 0.0.0.0  
  
Changes to IP encapsulation, LAN IP address or LAN IP mask  
will cause open telnet sessions to be closed.
```

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 of the DACS II AX. Consult your network administrator to obtain a valid IP address for the DACS II AX.

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 Enable set to **No** 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 disabled 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 the router or switch is on another LAN segment.

Configuring the SNMP Agent

Purpose The SNMP Agent Configuration Menu is 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.

Before you begin The Client Profiles Menu can only be accessed by a user with an Administrator user security level. The Client Profile Menu is used to enter destinations for SNMP traps.

Procedure To configure the SNMP agent:

1. From the *DACS II AX 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....: enter domain name here  
System description....: Lucent Technologies          DACS II AX 11 - System Manager  
System location.....: enter location here  
System contact.....: enter contact name here  
  
General Agent Properties  
-----  
Sets.....: Enabled  
Traps.....: Enabled  
Authentication traps..: Enabled  
Provisioning traps....: Disabled  
  
[C]lient Profiles Menu
```

Figure 4-10. SNMP Agent Configuration Menu

2. Specify the parameters for the SNMP Agent. Refer to [SNMP Agent /Client Profiles Field Descriptions](#) for descriptions of these parameters.
3. To configure the SNMP client profiles, press **C**. Client Profiles can only be accessed by a user with an Administrator user security level.

The Client Profiles Menu displays.

Lucent Technologies	DACS II AX 11 - System Manager	Help = [?]
Client Profiles Menu		
Trap Destinations	Trap Community Profiles	
-----	-----	
0.0.0.0	trapProfile	
0.0.0.0	trapProfile	
0.0.0.0	trapProfile	
0.0.0.0	trapProfile	
0.0.0.0	trapProfile	
0.0.0.0	trapProfile	
0.0.0.0	trapProfile	
0.0.0.0	trapProfile	
Read-Only Community Profile	Read/Write Community Profiles	
public	private	
public	private	
public	private	
public	private	

Figure 4-11. Client Profiles Menu

4. Enter the client profile information. Refer to [Client Profiles](#) for a description of the Client Profile entry fields.
5. From the Client Profiles Menu, press **X** to save and exit to the SNMP Agent Configuration Menu.
6. To confirm action when prompted, press **Y**.
7. From the SNMP Agent Configuration Menu, press **X** to save and exit.
8. To confirm action when prompted, press **Y**.

**SNMP Agent /
Client Profiles
Field Descriptions**

System Group Parameters

System domain name: (*text field*) This field is used to uniquely identify the DACS II AX system. It can contain up to 50 ASCII characters. It sets the MIB-II sysName variable.

System description: (*not user-programmable*) This field is used to input 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 is used to input the physical location of the DACS II AX system (i.e., utility room, ground floor, etc.). It can contain up to 50 ASCII characters. It sets the MIB-II sysLocation variable.

System contact: (*text field*) This field is used to identify the contact person for the DACS II AX system, and provides information on how to contact this person. It can contain up to 50 ASCII characters. It sets the MIB-II sysContact variable.

General Agent Profiles

Sets: (*option field*) This parameter enables/disables set messages.

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

Authentication Traps: (*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.

Provisioning traps: [Default: Disabled]: Provisioning traps are those traps that are triggered by a user configuration change. They do not include alarms or event traps. When this parameter is *enabled*, provisioning traps are sent to all of the IP addresses configured in the *Trap Destinations* fields. When it is *disabled*, provisioning traps are sent to all of those IP addresses except the IP address from which the system was provisioned via SNMP.

Client Profiles

Trap Destinations: [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.

Trap Community Profiles: [Default: trapProfile]: This is the community string used in each trap message sent to the associated trap destination. It can contain up to 37 ASCII characters.

Read-Only Community Profiles: [Default: Public]: This is the community string used for the read-only access to the DACS II AX's MIB objects. It can contain up to 37 ASCII characters.

Read/Write Community Profiles: [Default: Private]: This is the community string used for read-write access to the DACS II AX's MIB objects. It can contain up to 37 ASCII characters. 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, logging system events and may also 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 *DACS II AX Main Menu*, select *System Configuration*, then select *Date and Time*.

The Date and Time Menu displays ([Figure 4-12](#)).

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.....: March
Day.....: 26
Year.....: 2001
Hour.....: 16
Minute....: 27
Second....: 45
Day.....: Monday
```

Figure 4-12. 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: Options are Sunday through Saturday.

Save and Restore Database

Description

The DACS II AX 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:

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 DACS II 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 DACS II 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.

On some UNIX hosts, a file will need to be created on the host system, since the TFTP server will not be able to create a file.
2. Run the host's TFTP server.
3. From the *DACS II 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.: 0.0.0.0  
Host directory..: c:\dacsii\mar01\  
Host file name..: AX1  
  
[S]ave Database      [R]estore Database
```

Figure 4-13. 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 DACS II AX's System Manager Cards.

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

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

1. Before you restore, you must re-enter the IP address for the DACS II AX on the Port IP Address Menu.

From the *DACS AX II Main Menu*, select *System Configuration*, then 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 *DACS II AX Main Menu*, select *System Configuration*, then select *Save/Restore Database*.

The Save and Restore Database Menu displays ([Figure 4-14](#)).

```
Lucent Technologies    DACS II AX 11 - System Manager    Help = [?]  
  
Save and Restore Database Menu  
  
Host IP address.: 0.0.0.0  
Host directory.: c:\dacsii\mar01\  
Host file name.: AX1  
  
[S]ave Database      [R]estore Database
```

Figure 4-14. 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 4 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 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.

Contents

■ Background	5-5
Purpose	5-5
Objectives	5-5
■ Overview	5-6
Purpose of Maps	5-6
Connection Maps and the N + 1 Protection Switch	5-6
Saving Connection Data	5-7
■ Connection Maps Manager Menu	5-8
Menu Options	5-8
Functions	5-9
■ Displaying the Active Map	5-10
■ Map Configuration Submenu	5-11
Purpose	5-11
Default Settings	5-11
Actions	5-11
■ Activating A Map	5-12
Procedure	5-12
■ Displaying a Map	5-13
Procedure	5-13

Map Configuration Field Descriptions	5-14
Map Commands	5-15
■ Displaying Selected Connections	5-16
Procedure	5-16
Connection Filters Field Descriptions	5-17
■ Adding A New Connection	5-18
Before You Begin	5-18
Procedure	5-18
Saving Connection Data	5-21
Connection Field Descriptions	5-21
■ Timeslot Numbering	5-24
Case A: Standard T1 Connection	5-25
Case B: Clear T1 Framed Connection	5-26
Case C: Clear T1 Unframed Connection	5-27
Case D: E1 CAS Connection	5-28
Case E: Clear E1 Framed CAS Connection	5-29
Case F: E1 NSA Connection	5-30
Case G: Clear E1 Framed NSA Connection	5-31
Case H: Clear E1 Unframed Connection	5-32
Case I: T1 to E1 CAS Connection	5-33
■ Changing An Existing Connection	5-34
Purpose	5-34
Connection Name Field	5-34
Changing an Existing Connection - Procedure	5-35
■ Setting Up A Listening Connection	5-37
Adding a Listen-Source Connection	5-37
Adding a Listen-Destination Connection	5-39
■ Testing a Connection	5-41
Procedure	5-41
Test Connection Field Descriptions	5-42
■ Copying A Map	5-46
Procedure	5-46

■ Map Definition Submenu	<u>5-47</u>
Assigning a Map Name and Description	<u>5-47</u>
Procedure	<u>5-47</u>
■ Time of Day Configuration Submenu	<u>5-48</u>
Purpose	<u>5-48</u>
Related Task	<u>5-48</u>
Procedure	<u>5-48</u>
Scheduling Maps Field Descriptions	<u>5-49</u>

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      0064k 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.

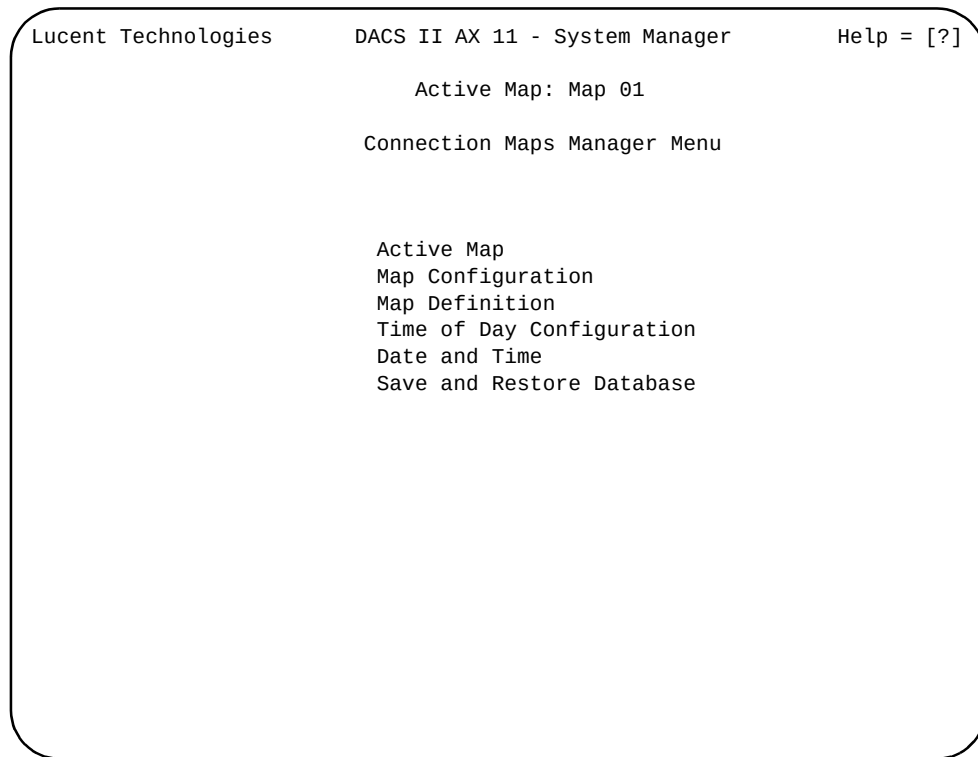


Figure 5-2. Connection Maps Manager Menu

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 the 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.

Displaying the Active Map

To configure or view the connection map that is currently active, select *Active Map* from the *Connections Map Manager Menu*.

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 Select *Map Configuration* from the *Connections Map Manager Menu* to: choose a map to work on, activate a map, or 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 displays.

Lucent Technologies

DACS II AX 11 - System Manager

Help = [?]

Configuration Maps Menu

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

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

```

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 5-6. Map Configuration Menu

The Map Configuration Menu displays the details of the selected connection map. The fields and commands available on this screen are described on the next page.

Map Configuration Field Descriptions

These fields appear on the Map Configuration menu ([Figure 5-6](#)).

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. Clear T1 or Clear E1 can also appear here for clear T1 and clear E1 connections.

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 ([Figure 5-6](#)):

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 restore a connection after testing is complete.
H, E, N, P	Home, End, Next, Previous: Use to navigate through the list of cross-connections in a map.

Displaying Selected Connections

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 to be filtered, and press **<Enter>**. The Map Configuration Menu displays.
3. From the Map Configuration Menu, press **F**. The Connection Filter Configuration Menu displays.

The screenshot shows a terminal window titled "Lucent Technologies" and "DACS II AX 11 - System Manager" with a "Help = [?]" prompt. The main content is the "Connection Filter Configuration" menu, which is displayed with a dashed line separator. The menu lists the following fields and their current values:

Connection Filter Configuration	
Filter Id.....:	None
Connection Name..:	
Slot Number.....:	0
Port Number.....:	0
TimeSlot Number..:	0

Figure 5-7. Connection Filter Configuration

4. Specify filter criteria. See [Connection Filters Field Descriptions](#). Press **X** to save.
5. 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

Before configuring a connection, the link or port must first be configured. Care must be taken to ensure that the connection timeslots are compatible with the type of link or port configured, otherwise an error message will appear when you try to save the connection.

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 displays.

```
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 5-8. Add New Connection Screen

4. Set the parameters of the connection. See [Connection Field Descriptions](#) 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 that may be in slot 1 (narrowband) slot 7 (broadband group 2) and slot 11 (broadband group 1).

5. When done, press **S** or **X** to save the connection information. Press **S** if you plan to make multiple connections, and you will automatically return to the Add New Connection Screen.
You are prompted: "View timeslot allocation? Are you sure? (Y/N)".
6. Press **Y** to display the timeslot allocation. Go on to step 8.
7. If you press **N**, the timeslot allocation is not displayed, however the new connection(s) are 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](#). and [Add A Connection Flowchart](#).

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

[V]iew all connections

[C]lear connection timeslots

Figure 5-9. Change Connection Screen - Example

Timeslots that contain an asterisk (*) were previously assigned. The appearance of the Change Connection screen varies depending on the link/port configuration and the timeslot/channel numbering scheme. See [Timeslot Numbering](#) for examples.

8. Press **X** to exit this screen.
9. When prompted: "Update Configuration? Are you sure (Y/N?)" press **Y**.

Saving Connection Data

[Figure 5-10](#) 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.

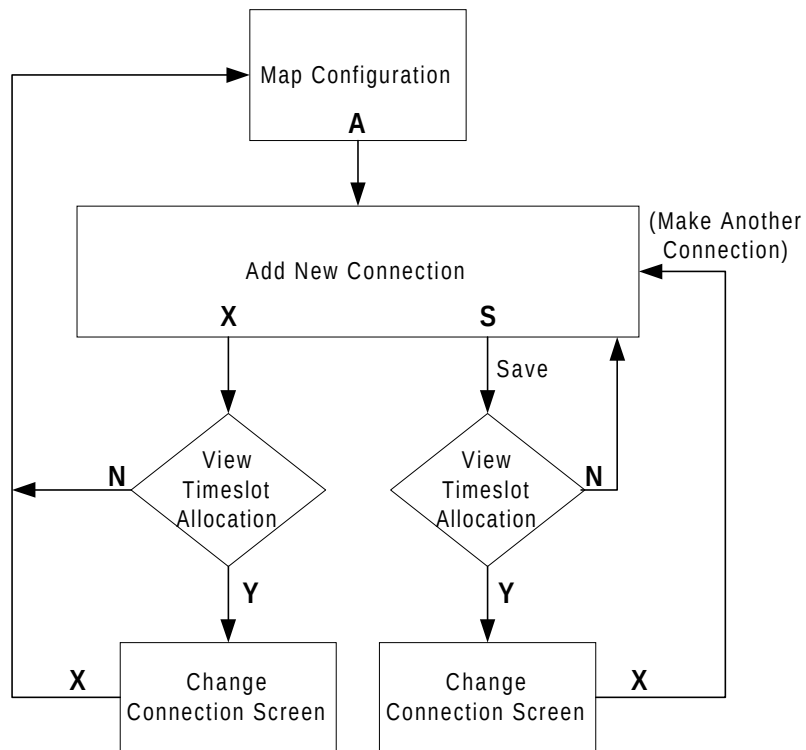


Figure 5-10. Add A Connection Flowchart

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. Try to keep connection names to eight characters or less, since only eight characters are displayed in the timeslot section of the Change Connection screen. For an example, see [Figure 5-20](#). When you assign Connection names, make sure the first eight characters contain enough information for you to identify the circuit.

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.

Speed: (Option field) This field represents the transmission speed. 1 DS0 equals 56 or 64K. Clear T1 or Clear E1 can also appear here for clear T1 and clear E1 connections.

A T1 digital transmission facility carries twenty-four 64 Kbps (DS0) channels, for a total of 1.536 Mbps (plus 8K overhead to total 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 total 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.

For the quad DS-1 and the DS3 modules, If the "Density" parameter is "Clear" on the Configuration screen, "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.

Ones density is set by the Line Type field for the Octal T1/E1, Hybrid DS-3, and STS-1 modules.

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. 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.

Timeslot Numbering

T1 and E1 use different timeslot numbering schemes. [Table 5-3](#) shows the timeslot numbering for several different types of connections. The bottom row of the table lists the related cases appear after the table.

Table 5-3. T1/E1 Numbering Schemes

Byte	T1 DS0			E1 CAS Telephone		E1 NSA Timeslot		
	Clear Disabled	Clear Framed	Clear Unframed	Clear Disabled	Clear Framed	Clear Disabled	Clear Framed	Clear Unframed
01	01	01	01	Framing		Framing		0
02	02	02	02	01		01		01
03	03	03	03	02		02		02
04	04	04	04	03		03		03
05	05	05	05	04		04		04
06	06	06	06	05		05		05
07	07	07	07	06		06		06
08	08	08	08	07		07		07
09	09	09	09	08		08		08
10	10	10	10	09		09		09
11	11	11	11	10		10		10
12	12	12	12	11		11		11
13	13	13	13	12		12		12
14	14	14	14	13		13		13
15	15	15	15	14		14		14
16	16	16	16	15		15		15
17	17	17	17	CAS		16		16
18	18	18	18	16		17		17
19	19	19	19	17		18		18
20	20	20	20	18		19		19
21	21	21	21	19		20		20
22	22	22	22	20		21		21
23	23	23	23	21		22		22
24	24	24	24	22		23		23
25	--	Framing	25	23		24		24
26	--	--	--	24		25		25
27	--	--	--	25		26		26
28	--	--	--	26		27		27
29	--	--	--	27		28		28
30	--	--	--	28		29		29
31	--	--	--	29		30		30
32	--	--	--	30		31		31
Case	A	B	C	D & E		F & G		H

Case A: Standard T1 Connection

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

Change Connection Screen

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

Src slot.port : 03.01 Octal T1/E1
Dest slot.port: 03.02 Octal T1/E1

Speed.....: 1536K/64 (24 DS0s)
Data/Voice....: Data

Src Port Time slot assignments

Dest Port Time slot assignments

01 Case A	13 Case A	01 Case A	13 Case A
02 Case A	14 Case A	02 Case A	14 Case A
03 Case A	15 Case A	03 Case A	15 Case A
04 Case A	16 Case A	04 Case A	16 Case A
05 Case A	17 Case A	05 Case A	17 Case A
06 Case A	18 Case A	06 Case A	18 Case A
07 Case A	19 Case A	07 Case A	19 Case A
08 Case A	20 Case A	08 Case A	20 Case A
09 Case A	21 Case A	09 Case A	21 Case A
10 Case A	22 Case A	10 Case A	22 Case A
11 Case A	23 Case A	11 Case A	23 Case A
12 Case A	24 Case A	12 Case A	24 Case A

[V]iew all connections
[C]lear connection timeslots

Figure 5-11. Case A: Standard T1 DS0 Numbering Change Connection Screen

[Figure 5-11](#) shows a Standard T1 DS0 connection in the DACS II AX. A T1 consists of 24 traffic-bearing timeslots which are numbered Slot 1 through Slot 24. Framing is handled outside of this 1.536 Mbps (i.e., 24 DS0s x 64 Kbps) bandwidth and voice signaling is supported in-band as robbed bits within specified frames, as required.

Case B: Clear T1 Framed Connection

```

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

                                Change Connection Screen

Connection name: Case B                      Type.....: Full-Duplex
Src slot.port  : 03.01 Octal T1/E1          Dest slot.port: 03.02 Octal T1/E1
Speed.....: Clear T1 (25 DS0s)            Data/Voice....: Data
-----
Src Port Time slot assignments              Dest Port Time slot assignments
01 Case B   13 Case B   FR <FRAME>          01 Case B   13 Case B   FR <FRAME>
02 Case B   14 Case B                                     02 Case B   14 Case B
03 Case B   15 Case B                                     03 Case B   15 Case B
04 Case B   16 Case B                                     04 Case B   16 Case B
05 Case B   17 Case B                                     05 Case B   17 Case B
06 Case B   18 Case B                                     06 Case B   18 Case B
07 Case B   19 Case B                                     07 Case B   19 Case B
08 Case B   20 Case B                                     08 Case B   20 Case B
09 Case B   21 Case B                                     09 Case B   21 Case B
10 Case B   22 Case B                                     10 Case B   22 Case B
11 Case B   23 Case B                                     11 Case B   23 Case B
12 Case B   24 Case B                                     12 Case B   24 Case B

[V]iew all connections          [C]lear connection timeslots

```

Figure 5-12. Case B: Clear T1 Framed Change Connection Screen

[Figure 5-12](#) showing a Clear T1 Framed connection in the DACS II AX. **<FRAME>** is used to denote that the 25th DS0 is used to transport framing overhead across the DACS II AX cross-connect fabric.

Clear T1 operation requires that the framing bit - bit 193 - needs to be transported intact across the DACS II AX cross-connect fabric. To support such 3-1 and 1-1 level cross-connects, this scheme is utilized by the Octal T1/E1, STS-1 and Hybrid DS-3 module sets.

**Case C:
Clear T1 Unframed
Connection**

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

Change Connection Screen

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

Src slot.port : 03.01 Octal T1/E1
Dest slot.port: 03.02 Octal T1/E1

Speed.....: Clear T1 (25 DS0s)
Data/Voice....: Data

Src Port Time slot assignments

Dest Port Time slot assignments

01 Case C	13 Case C	25 Case C	01 Case C	13 Case C	25 Case C
02 Case C	14 Case C		02 Case C	14 Case C	
03 Case C	15 Case C		03 Case C	15 Case C	
04 Case C	16 Case C		04 Case C	16 Case C	
05 Case C	17 Case C		05 Case C	17 Case C	
06 Case C	18 Case C		06 Case C	18 Case C	
07 Case C	19 Case C		07 Case C	19 Case C	
08 Case C	20 Case C		08 Case C	20 Case C	
09 Case C	21 Case C		09 Case C	21 Case C	
10 Case C	22 Case C		10 Case C	22 Case C	
11 Case C	23 Case C		11 Case C	23 Case C	
12 Case C	24 Case C		12 Case C	24 Case C	

[V]iew all connections
[C]lear connection timeslots

Figure 5-13. Case C: Clear T1 Unframed Change Connection Screen

[Figure 5-13](#) shows a Clear T1 Unframed connection in the DACS II AX. When Clear T1 Unframed traffic is transported across the DACS II AX platform, the location and nature of any supported framing structure or overhead bit(s) is unknown; therefore, the needed 193rd bit for 1.544 Mbps operation will be placed in the 25th DS0 as needed.

Case D: E1 CAS Connection

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

Change Connection Screen

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

Src slot.port : 03.01 Octal T1/E1
Dest slot.port: 03.02 Octal T1/E1

Speed.....: 1920K/64 (30 DS0s)
Data/Voice....: Data

Src Port Time slot assignments

Dest Port Time slot assignments

FR [FRAME] 12 Case D 23 Case D	FR [FRAME] 12 Case D 23 Case D
01 Case D 13 Case D 24 Case D	01 Case D 13 Case D 24 Case D
02 Case D 14 Case D 25 Case D	02 Case D 14 Case D 25 Case D
03 Case D 15 Case D 26 Case D	03 Case D 15 Case D 26 Case D
04 Case D CS [CAS] 27 Case D	04 Case D CS [CAS] 27 Case D
05 Case D 16 Case D 28 Case D	05 Case D 16 Case D 28 Case D
06 Case D 17 Case D 29 Case D	06 Case D 17 Case D 29 Case D
07 Case D 18 Case D 30 Case D	07 Case D 18 Case D 30 Case D
08 Case D 19 Case D	08 Case D 19 Case D
09 Case D 20 Case D	09 Case D 20 Case D
10 Case D 21 Case D	10 Case D 21 Case D
11 Case D 22 Case D	11 Case D 22 Case D

[V]iew all connections
[C]lear connection timeslots

Figure 5-14. Case D: E1 CAS Change Connection Screen

[Figure 5-14](#) shows an E1 CAS connection in the DACS II AX. **[FRAME]** denotes that framing overhead is not transported across the cross-connect fabric, and **[CAS]** denotes that the signaling channel is not transported (ABCD passed via DACS II AX signaling bus).

When Channel Associated Signaling (CAS) operation is selected, the framing and signaling channels are terminated at the ingress and egress E1 ports; therefore, only 30 channels are transported across the cross-connect fabric as needed.

**Case E:
Clear E1 Framed
CAS Connection**

```

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

                                Change Connection Screen

Connection name: Case E      Type.....: Full-Duplex
Src slot.port   : 03.01 Octal T1/E1      Dest slot.port: 03.02 Octal T1/E1
Speed.....: Clear E1 (32 DS0s)      Data/Voice....: Data
-----
Src Port Time slot assignments      Dest Port Time slot assignments
FR <FRAME> 12 Case E 23 Case E      FR <FRAME> 12 Case E 23 Case E
01 Case E 13 Case E 24 Case E      01 Case E 13 Case E 24 Case E
02 Case E 14 Case E 25 Case E      02 Case E 14 Case E 25 Case E
03 Case E 15 Case E 26 Case E      03 Case E 15 Case E 26 Case E
04 Case E CS <CAS> 27 Case E      04 Case E CS <CAS> 27 Case E
05 Case E 16 Case E 28 Case E      05 Case E 16 Case E 28 Case E
06 Case E 17 Case E 29 Case E      06 Case E 17 Case E 29 Case E
07 Case E 18 Case E 30 Case E      07 Case E 18 Case E 30 Case E
08 Case E 19 Case E                08 Case E 19 Case E
09 Case E 20 Case E                09 Case E 20 Case E
10 Case E 21 Case E                10 Case E 21 Case E
11 Case E 22 Case E                11 Case E 22 Case E

[V]iew all connections      [C]lear connection timeslots

```

Figure 5-15. Case E: Clear E1 Framed CAS Change Connection Screen

[Figure 5-15](#) shows a Clear E1 Framed CAS connection in the DACS II AX. **<FRAME>** denotes that framing channel overhead is transported across the cross-connect fabric and **<CAS>** denotes that the signaling channel is transported (ABCD not passed via DACS II AX signaling bus).

**Case F:
E1 NSA
Connection**

```

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

                                Change Connection Screen

Connection name: Case F      Type.....: Full-Duplex
Src slot.port   : 03.01 Octal T1/E1      Dest slot.port: 03.02 Octal T1/E1
Speed.....: 1984K/64 (31 DS0s)      Data/Voice....: Data
-----
Src Port Time slot assignments      Dest Port Time slot assignments
FR [FRAME] 12 Case F 24 Case F      FR [FRAME] 12 Case F 24 Case F
01 Case F 13 Case F 25 Case F      01 Case F 13 Case F 25 Case F
02 Case F 14 Case F 26 Case F      02 Case F 14 Case F 26 Case F
03 Case F 15 Case F 27 Case F      03 Case F 15 Case F 27 Case F
04 Case F 16 Case F 28 Case F      04 Case F 16 Case F 28 Case F
05 Case F 17 Case F 29 Case F      05 Case F 17 Case F 29 Case F
06 Case F 18 Case F 30 Case F      06 Case F 18 Case F 30 Case F
07 Case F 19 Case F 31 Case F      07 Case F 19 Case F 31 Case F
08 Case F 20 Case F                08 Case F 20 Case F
09 Case F 21 Case F                09 Case F 21 Case F
10 Case F 22 Case F                10 Case F 22 Case F
11 Case F 23 Case F                11 Case F 23 Case F

[V]iew all connections      [C]lear connection timeslots
  
```

Figure 5-16. Case F: E1 NSA Change Connection Screen

[Figure 5-16](#) shows an E1 NSA connection in the DACS II AX. **[FRAME]** denotes that framing channel overhead is not transported across the cross-connect fabric.

When Non-Signaling Associated (NSA) operation is selected, E1 is strictly supporting data and/or common channel signaling based voice (i.e., no channel associated signaling) traffic; therefore, a total of 31 channels are available for user information. The framing is resident in the first channel and is terminated within the network or equipment facing port. Following the initial framing channel, the subsequent channels are numbered in uninterrupted sequence from 01-to-31.

Case G: Clear E1 Framed NSA Connection

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

Change Connection Screen

Connection name: Case G
 Type.....: Full-Duplex
 Src slot.port : 03.01 Octal T1/E1
 Dest slot.port: 03.02 Octal T1/E1
 Speed.....: Clear E1 (32 DS0s)
 Data/Voice....: Data

Src Port Time slot assignments			Dest Port Time slot assignments		
FR <FRAME>	12 Case G	24 Case G	FR <FRAME>	12 Case G	24 Case G
01 Case G	13 Case G	25 Case G	01 Case G	13 Case G	25 Case G
02 Case G	14 Case G	26 Case G	02 Case G	14 Case G	26 Case G
03 Case G	15 Case G	27 Case G	03 Case G	15 Case G	27 Case G
04 Case G	16 Case G	28 Case G	04 Case G	16 Case G	28 Case G
05 Case G	17 Case G	29 Case G	05 Case G	17 Case G	29 Case G
06 Case G	18 Case G	30 Case G	06 Case G	18 Case G	30 Case G
07 Case G	19 Case G	31 Case G	07 Case G	19 Case G	31 Case G
08 Case G	20 Case G		08 Case G	20 Case G	
09 Case G	21 Case G		09 Case G	21 Case G	
10 Case G	22 Case G		10 Case G	22 Case G	
11 Case G	23 Case G		11 Case G	23 Case G	

[V]iew all connections
 [C]lear connection timeslots

Figure 5-17. Case G - Clear E1 Framed NSA Change Connection Screen

[Figure 5-17](#) shows a Clear E1 Framed NSA connection in the DACS II AX. **<FRAME>** denotes that framing channel overhead is transported across the cross-connect fabric.

In the Clear E1 Framed NSA application, the framing channel location and operation is known; therefore, it can be handled and passed as the first timeslot. All 32 timeslots need to be transported across the cross-connect fabric in timeslot-by-timeslot sequence.

**Case H:
Clear E1 Unframed
Connection**

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

Change Connection Screen

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

Src slot.port : 03.01 Octal T1/E1
Dest slot.port: 03.02 Octal T1/E1

Speed.....: Clear E1 (32 DS0s)
Data/Voice....: Data

Src Port Time slot assignments

Dest Port Time slot assignments

00 Case H	12 Case H	24 Case H	00 Case H	12 Case H	24 Case H
01 Case H	13 Case H	25 Case H	01 Case H	13 Case H	25 Case H
02 Case H	14 Case H	26 Case H	02 Case H	14 Case H	26 Case H
03 Case H	15 Case H	27 Case H	03 Case H	15 Case H	27 Case H
04 Case H	16 Case H	28 Case H	04 Case H	16 Case H	28 Case H
05 Case H	17 Case H	29 Case H	05 Case H	17 Case H	29 Case H
06 Case H	18 Case H	30 Case H	06 Case H	18 Case H	30 Case H
07 Case H	19 Case H	31 Case H	07 Case H	19 Case H	31 Case H
08 Case H	20 Case H		08 Case H	20 Case H	
09 Case H	21 Case H		09 Case H	21 Case H	
10 Case H	22 Case H		10 Case H	22 Case H	
11 Case H	23 Case H		11 Case H	23 Case H	

[V]iew all connections
[C]lear connection timeslots

Figure 5-18. Case H: Clear E1 Unframed Change Connection Screen

[Figure 5-18](#) shows a Clear E1 Unframed connection in the DACS II AX. When Clear E1 Unframed traffic is transported across the DACS II AX platform, the location and nature of any supporting framing structure or overhead channel(s) is unknown; therefore, any special channels cannot be identified. All 32 channels need to be transported across the cross-connect fabric in channel-by-channel sequence.

Case I: T1 to E1 CAS Connection

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

Change Connection Screen

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

Src slot.port : 03.01 Octal T1/E1
Dest slot.port: 03.02 Octal T1/E1

Speed.....: 768K/64 (12 DS0s)
Data/Voice....: Voice/AuToMu

Src Port Time slot assignments

Dest Port Time slot assignments

01 - 13 Mixed	FR [FRAME] 12 - 23 Mixed
02 - 14 Mixed	01 - 13 Mixed 24 Mixed
03 - 15 Mixed	02 - 14 Mixed 25 -
04 - 16 Mixed	03 - 15 Mixed 26 -
05 - 17 Mixed	04 - CS [CAS] 27 -
06 - 18 Mixed	05 - 16 Mixed 28 -
07 - 19 Mixed	06 - 17 Mixed 29 -
08 - 20 Mixed	07 - 18 Mixed 30 -
09 - 21 Mixed	08 - 19 Mixed
10 - 22 Mixed	09 - 20 Mixed
11 - 23 Mixed	10 - 21 Mixed
12 - 24 Mixed	11 - 22 Mixed

[V]iew all connections
[C]lear connection timeslots

Figure 5-19. Case I: Gateway Cross-Connect - T1 to E1 CAS Change Connection Screen

[Figure 5-19](#) shows a T1 to E1 CAS connection in the DACS II AX. **[FRAME]** denotes that framing timeslot/channel overhead is not transported across the cross-connect fabric, and **[CAS]** denotes that signaling channel is not transported (ABCD passed via DACS II AX signaling bus).

The DACS II AX can cross-connect T1-based traffic and E1-based traffic. The necessary companding (e.g., μ -law to A-law) and signaling (e.g., robbed-bit to CAS) conversion is performed as required. The exception to this rule is that Clear T1s and Clear E1s of any type can only be cross-connected to like configurations.

When a T1 and E1 cross-connect is made, ensure that the desired timeslot assignments are made. To illustrate how different numbering schemes may “shift” the expected alignment, [Figure 5-19](#) illustrates a 768 Kbps connection made between a source DS0 T1 numbered port and destination E1 CAS numbered port with the data channel starting on #13 at both ends.

Changing An Existing Connection

Purpose You can change a connection by re-assigning timeslots or changing the speed. All other parameters are read-only.

Connection Name Field Connection names are truncated to eight characters in the timeslot section of the Change Connection screen. When you assign Connection names on the Add New Connection screen, make sure the first eight characters contain enough information for you to identify the circuit.

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

Change Connection Screen

Full Connection name displays here. →
Connection name can be up to 19 characters.

Connection name: ABC Customer Type.....: Full-Duplex
Src slot.port : 07.02 HDS-3 Dest slot.port: 03.02 Octal T1/E1
Speed.....: 192K/64 (3 DS0s) Data/Voice....: Data

Src Port Time slot assignments		Dest Port Time slot assignments	
01 -	13 -	FR [FRAME] 12 -	23 -
02 -	14 -	01 -	13 -
03 -	15 -	02 -	14 -
04 -	16 -	03 -	15 -
05 -	17 -	04 ABC Cust CS [CAS]	27 -
06 -	18 -	05 ABC Cust 16 -	28 -
07 -	19 -	06 ABC Cust 17 -	29 -
08 -	20 -	07 -	18 -
09 -	21 -	08 -	19 -
10 ABC Cust	22 -	09 -	20 -
11 ABC Cust	23 -	10 -	21 -
12 ABC Cust	24 -	11 -	22 -

[V]iew all connections [C]lear connection timeslots

First eight characters appear for **Connection name** next to the timeslot number. →

Figure 5-20. Connection Name Truncated

Changing an Existing Connection - 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>**. Depending on the type of link, the Change Connection screen displays with the corresponding timeslot numbering.

```

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

[V]iew all connections      [C]lear connection timeslots
  
```

Figure 5-21. Change Connection Screen - Example

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 set up a one-way path from the source or destination to the listening port. Listen is non-disruptive to data in the original connection. A listen connection can be set up on any of the channel cards.

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 displays:

```
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 5-22. 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 displays:

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 5-23. 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.

- 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 5-24. 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 displays.

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

**** Test Connection screen ****

Connection name: CustA
Type.....: Full-Duplex
Src slot.port : 04.02 Octal T1/E1
Dest slot.port: 04.03 Octal T1/E1
Speed.....: 64K (1 DS0)
Data/Voice....: Data
===== Test id.: Split-Src
TESTER slot.port: 05.02

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 CustA	15 *		04 .	15 *	
05 *	16 .		05 *	16 *	
06 *	17 *		06 *	17 CustA	
07 *	18 *		07 *	18 *	
08 *	19 *		08 *	19 *	
09 *	20 *		09 *	20 *	
10 *	21 *		10 *	21 *	
11 *	22 *		11 *	22 *	

Figure 5-25. 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, such as a port on the Test Access module.
6. To save changes and exit to the Active Map menu, press **X** and confirm action when prompted by pressing **Y**.
7. Conduct the tests from the Diagnostics menu of the module indicated in the *TESTER slot.port* field.
8. After testing, return to the Map Configuration menu ([Figure 5-24](#)), 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 5-26](#) is a basic diagram of Monitor-Source testing.

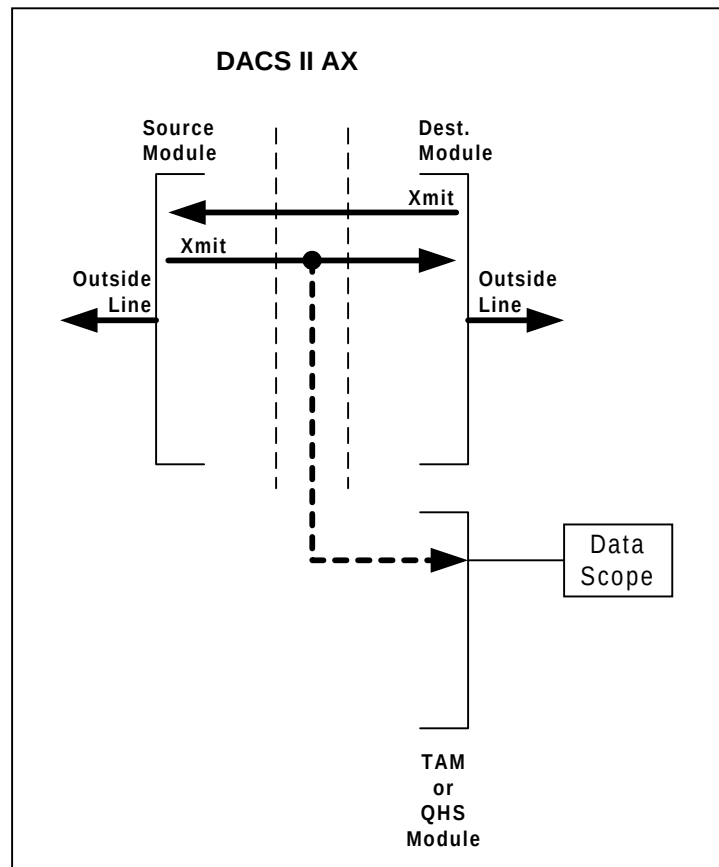


Figure 5-26. Monitor-Source Testing

- **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 5-27](#) is a basic diagram of Monitor-Destination testing.

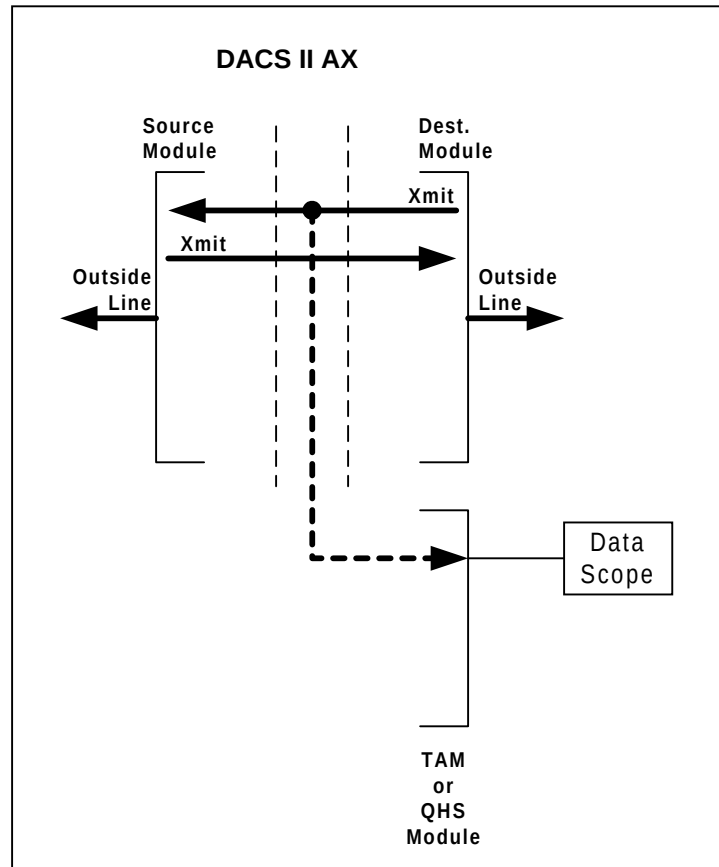


Figure 5-27. Monitor-Destination Testing

- **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 5-28](#) is a basic diagram of Split-Source testing.

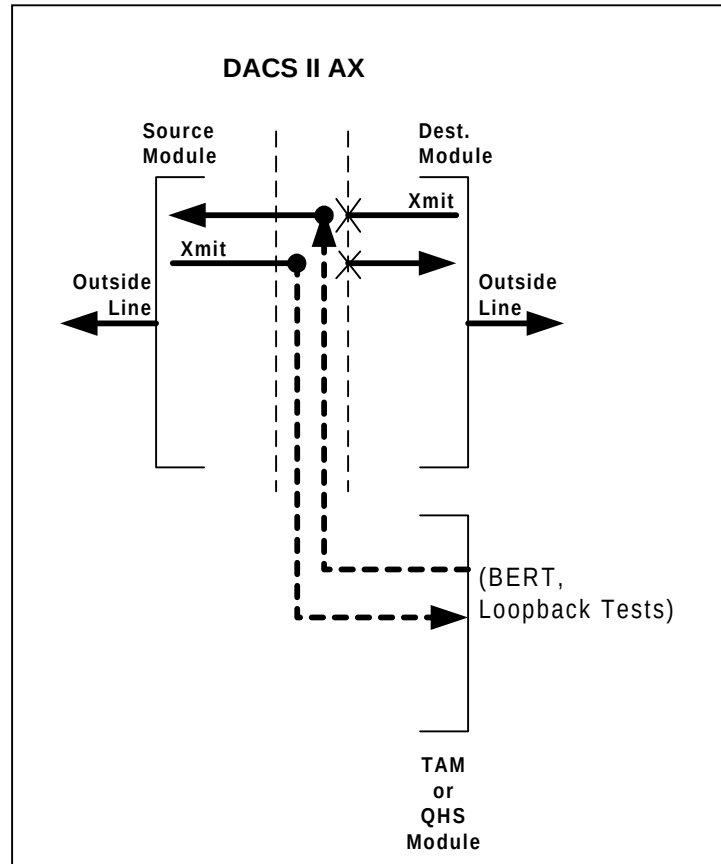


Figure 5-28. Split-Source Testing

- **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 5-29](#) is a basic diagram of Split-Destination testing.

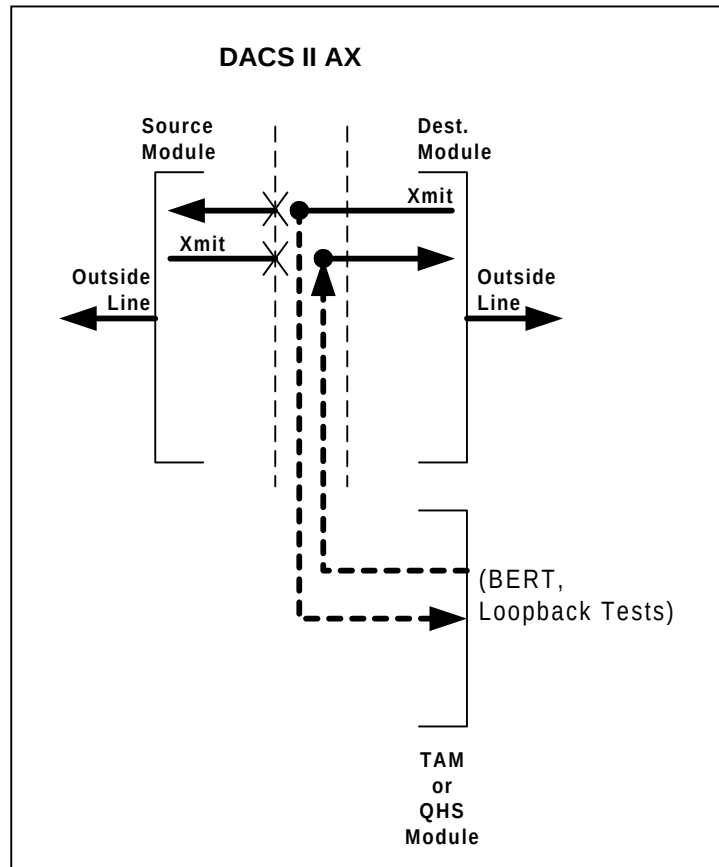


Figure 5-29. Split-Destination Testing

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* displays.
 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 displays 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" displays. 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.

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

Definition Maps Menu

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 5-30. Definition Maps Menu

2. Move your cursor to the field to be modify and press **<Enter>**.
3. Type in the new Name or Description and press **<Enter>**.
4. Press **X**. Changes are saved and you return to the Connection Maps Manager Menu.

Time of Day Configuration Submenu

Purpose 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.

Related Task To activate a map immediately, 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 displays.

Lucent Technologies				DACS II AX 11 - System Manager			
Time Of Day Configuration Manager				Monday , December 11 09:03			
				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	
...	...	...	...	...	...	...	
-----	-----	-----	-----	-----	-----	-----	

Figure 5-31. Time of Day Configuration Map Manager

2. 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. For details, see [Setting the Current Date and Time](#) in Chapter 4, System Configuration.
3. For each day, there are five blocks. The time is displayed in 24-hour notation. To schedule a map for activation, move your cursor to the block that you wish to configure. Press **<Enter>** to select the hour, minutes, and the Map Name. Use the spacebar to move between fields.



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 updated.

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.

Contents

■ Background	6-3
■ Accessing the Events Menu	6-4
Procedure	6-4
■ Monitor Events	6-5
Purpose	6-5
Procedure	6-5
■ Display Event Log	6-7
Purpose	6-7
Procedure	6-7
■ Event Configuration	6-9
Purpose	6-9
Before You Begin	6-9
Procedure	6-9
■ Event Configuration Field Descriptions	6-10

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.

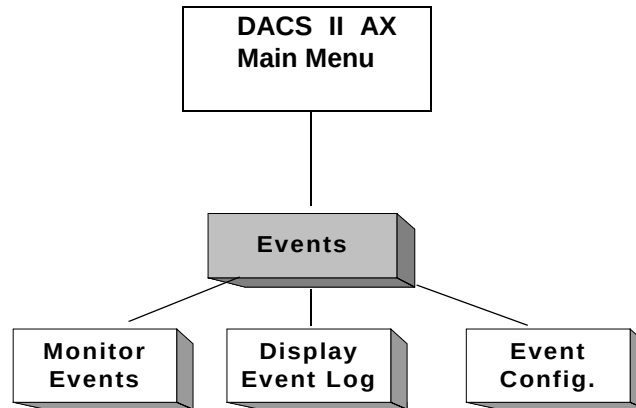


Figure 6-1. Events Menu Structure

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](#)).

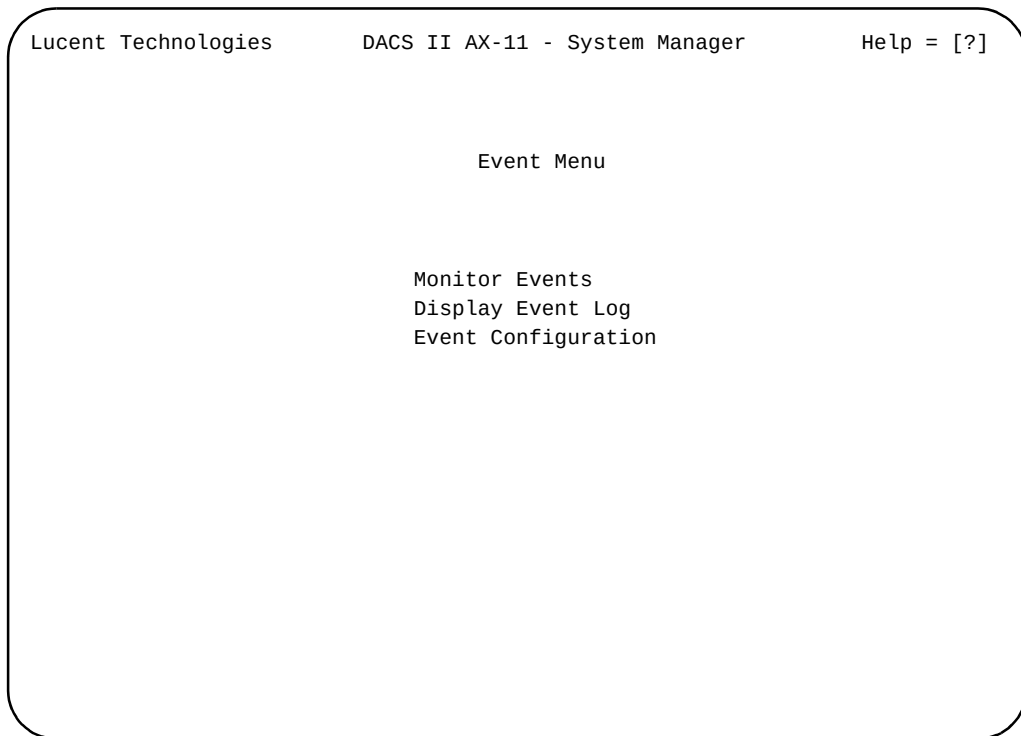


Figure 6-2. Events Menu

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.
-

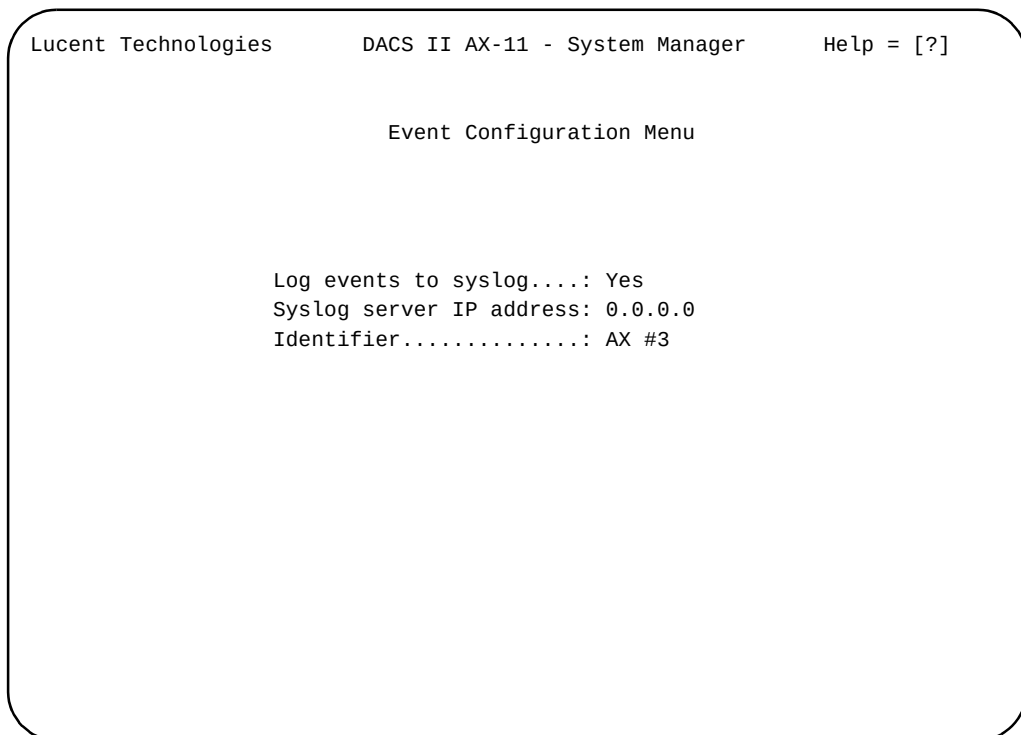
Event Configuration

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 with the following text:

```
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.

Contents

■ Background	7-3
Overview	7-3
Before you begin	7-3
■ Utilities Menu	7-4
Accessing the Utilities Menu	7-4
■ Copy Files to Standby SMC	7-5
Description	7-5
Related tasks	7-5
Procedure	7-6
■ Switchover SMCs	7-7
Description	7-7
Before you begin	7-7
Procedure	7-7
■ MIB Table	7-9
Description	7-9
Procedure	7-9
■ Ping	7-10
Description	7-10
Procedure	7-10

Ping Fields	<u>7-11</u>
■ IP Route Table	<u>7-12</u>
Description	<u>7-12</u>
Procedure	<u>7-12</u>
IP Route Fields	<u>7-15</u>
■ ARP Table	<u>7-16</u>
Description	<u>7-16</u>
Procedure	<u>7-16</u>
ARP Table Fields	<u>7-17</u>
■ Return to Default Settings	<u>7-18</u>
Description	<u>7-18</u>
Before You Begin	<u>7-18</u>
Procedure	<u>7-19</u>
■ Backplane Timeslots Display	<u>7-20</u>
Description	<u>7-20</u>
Procedure	<u>7-21</u>
■ Initialize SMC Rear Card Modem	<u>7-22</u>
Description	<u>7-22</u>
Procedure	<u>7-22</u>
■ Download Devices Software	<u>7-23</u>
Description	<u>7-23</u>
Related Information	<u>7-23</u>
■ Reset All Channel Cards	<u>7-24</u>
Description	<u>7-24</u>
Before you begin	<u>7-24</u>
Procedure	<u>7-24</u>
■ Backplane Supervisory Bus Submenu	<u>7-25</u>
Description	<u>7-25</u>
Procedure	<u>7-25</u>
■ Close All Other Telnet Sessions	<u>7-27</u>
Description	<u>7-27</u>
Procedure	<u>7-27</u>

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](#)).

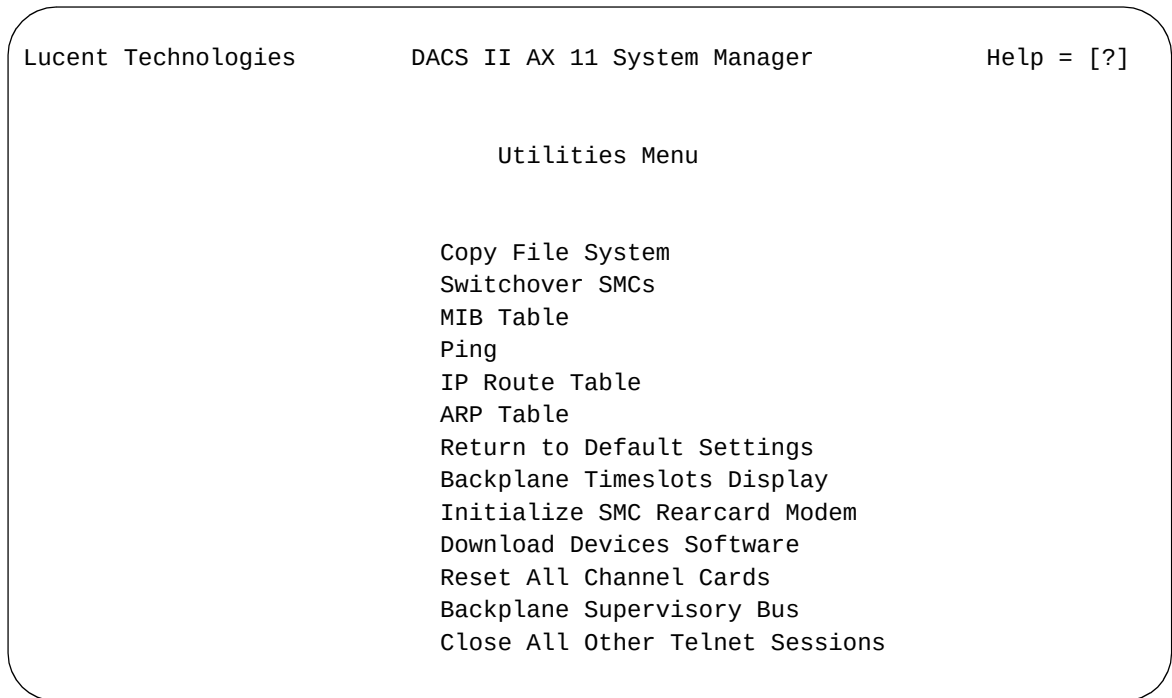


Figure 7-1. Utilities Menu

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?

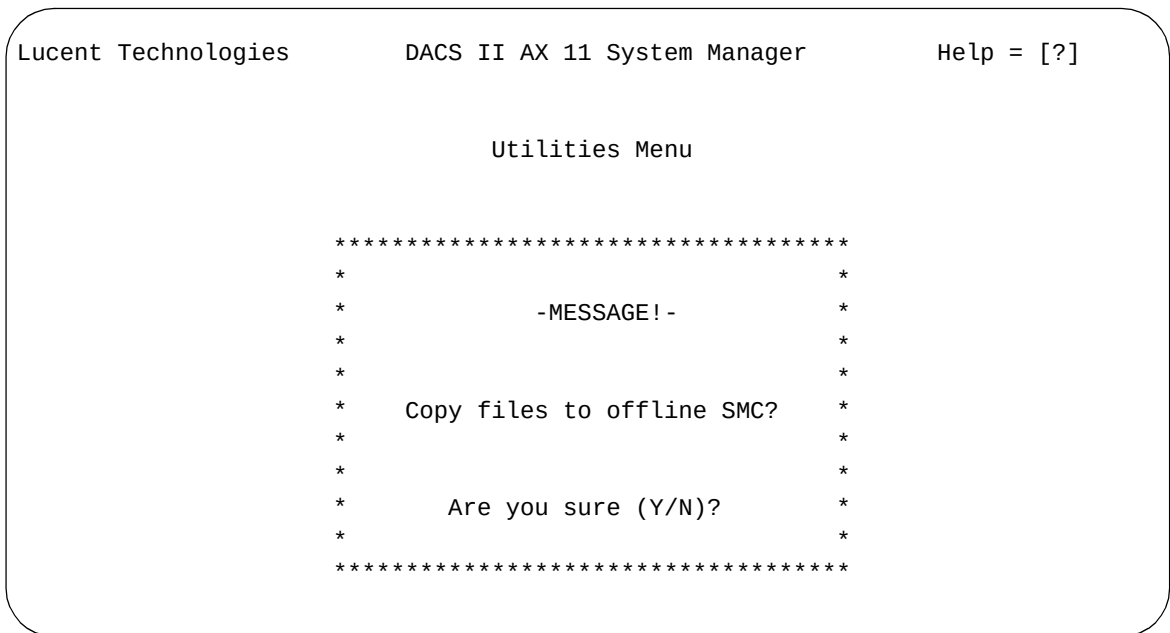


Figure 7-2. Copy File System Menu

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.

Before you begin When you switch SMCs, your current Telnet or terminal session will be lost. You will have to re-establish your session.

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?

```
Lucent Technologies      DACS II AX 11 System Manager      Help = [?]  
  
                          Utilities Menu  
  
*****  
*                                                                    *  
*          -MESSAGE! -          *  
*                                                                    *  
*          Switchover SMCs?      *  
*                                                                    *  
*          Are you sure (Y/N)?   *  
*                                                                    *  
*****
```

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. There is no completion message.

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 IP variables, ICMP variables, and UDP variables of the MIB-II parameters as defined in RFC 1213.

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...:    135471 ipInHdrError:          0 ipInAddrErrors:          0
ipForwDatagrams:      0 ipInDiscards:          0 ipInDelivers:        135441
ipUnknownProtos:      0 ipOutRequest:        19048 ipOutDiscard:          0
ipOutNoRoutes...:    83 ipReasmOKs :          0 ipReasmFails:          0
***** ICMP variables *****
icmpInMsgs.....:      2 icmpInErrors:          0 icmpInDestUnreac:      0
icmpInTimeExcds:      0 icmpInParmPr:          0 icmpInSrcQuenchs:      0
icmpInEchos.....:      2 icmpInEchoRp:          0 icmpInTimestamps:      0
icmpInTstampRep:      0 icmpInAddrMa:          0 icmpInAddrMaskRe:      0
icmpOutMsgs.....:     51 icmpOutError:          0 icmpOutDestUnrea:     49
icmpOutTimeExcd:      0 icmpOutParmP:          0 icmpOutSrcQuench:      0
icmpOutRedirect:      0 icmpOutEchos:          0 icmpOutEchoReps :      2
icmpOutTimestam:      0 icmpTimesRep:          0 icmpOutAddrMasks:      0
icmpOutAddrMaRe:      0
***** UDP variables *****
udpInDatagrams.:     134584 udpNoPorts :          0 udpInErrors :          0
udpOutDatagrams:     18109
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 DACS II 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.....: xxx.xxx.xxx.xxx  
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 X or **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 or IP packets 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](#)).

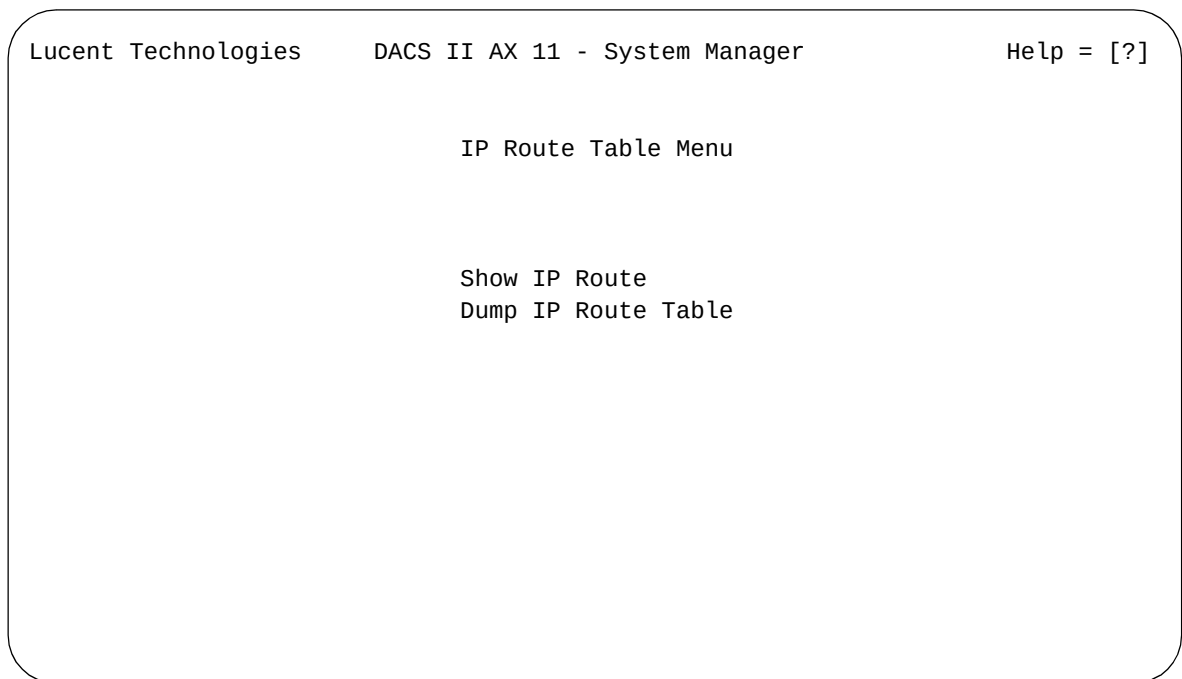


Figure 7-6. IP Route Table Menu

IP Route Table (Continued)

Procedure (Continued)

2. If you select Show IP Route, enter the Requested route.

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.: xxx.xxx.xxx.xxx

Route.....: xxx.xxx.xxx.xxx Port.....:

Mask.....: Hops.....: 0

Next hop.....: TimeToLive.....: 180

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
-----	----	-----	----	----	-----
xxx.xxx.xxx.xx	xxx.xxx.xxx.xxx	Direct	Internal	0	Forever
xxx.xxx.xxx.xx	xxx.xxx.xxx.xxx	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
-----
xxx.xxx.xxx.xxx      xx:xx:xx:xx:xx:xx    Resolved   600
xxx.xxx.xxx.xxx      xx:xx:xx:xx:xx:xx    Resolved   521
xxx.xxx.xxx.xxx      xx:xx:xx:xx:xx:xx    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.
- Removes the IP address from the LAN port.

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?

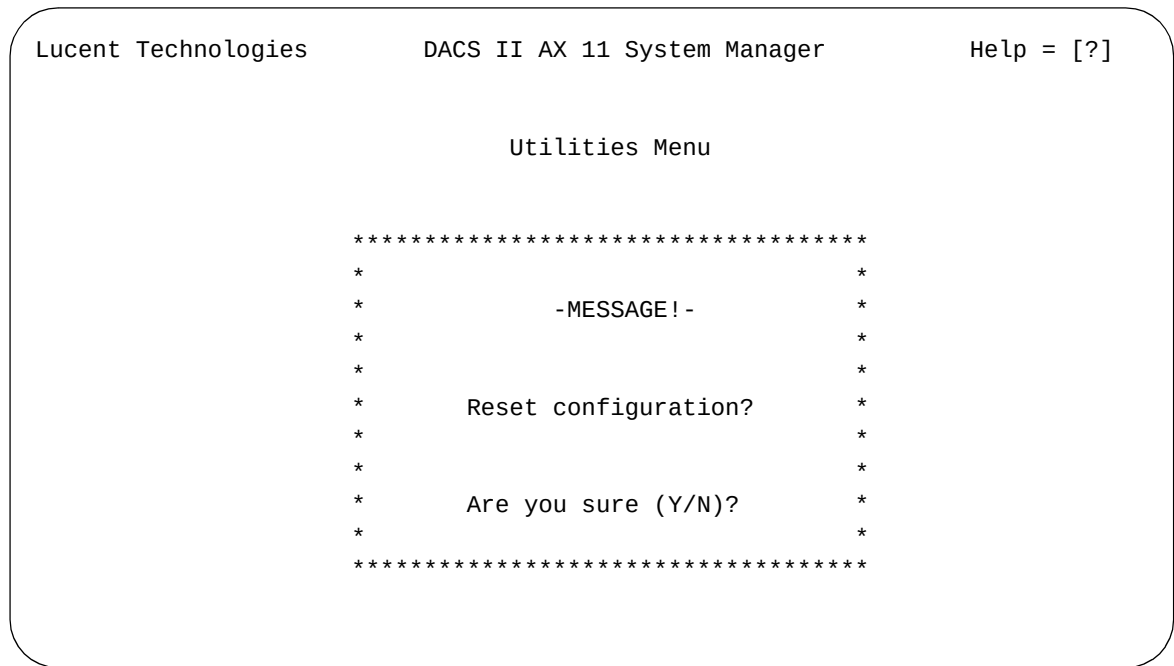


Figure 7-10. Default Settings Display

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 (SI), 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 a connection is set up for testing, the flag also provides the tester slot and port as well as the bus associated with each connection.

For example, WSda7(00.00) is a flag. The flag is defined as follows:

Character	Possible Values
First	W = Write to Backplane R = Read from Backplane
Second	D = Destination S = Source
Third	d = data v = voice
Fourth	a = bus a b = bus b
Fifth	7 bits 8 bits
Last	(00.00) the tester slot and port numbers

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 access technical support. Initialize the modem before use.

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 completed.

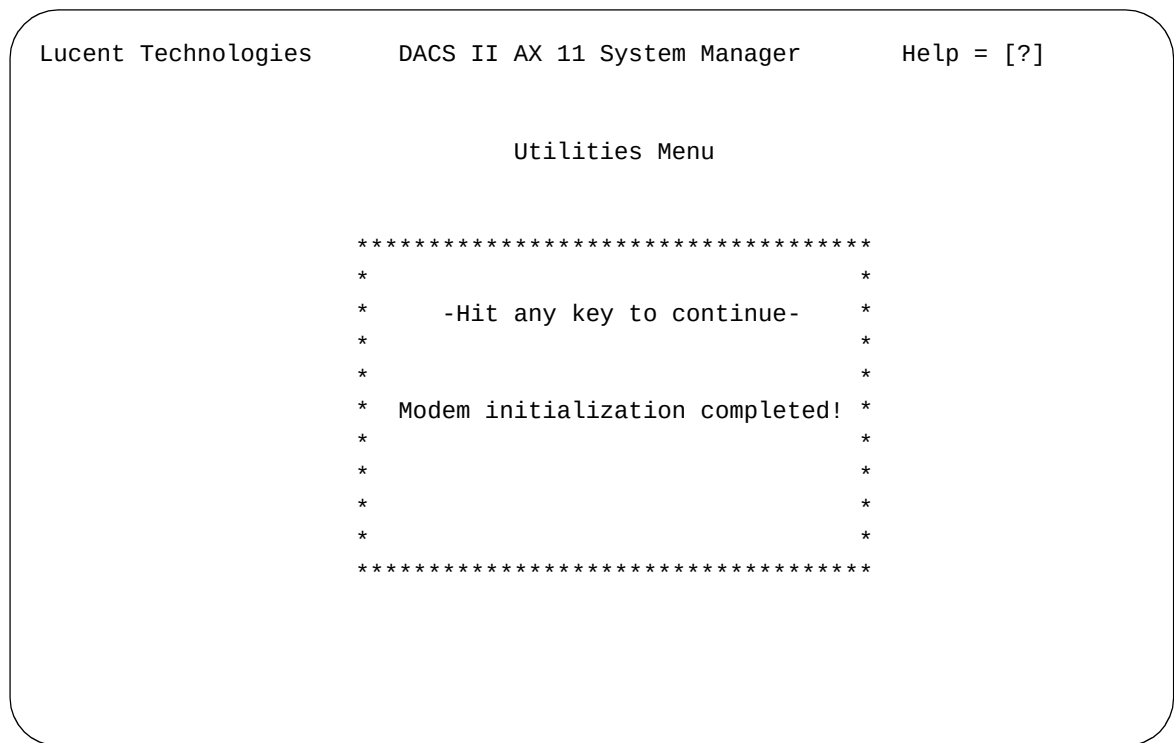


Figure 7-12. Initialize SMC Rear Card Modem

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 Appenidix A, Software Upgrade .

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. See [Return to 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?

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

                          Utilities Menu

                          *****
                          *
                          *           -MESSAGE! -           *
                          *
                          *           Reset all AX channel cards?           *
                          *
                          *           Are you sure (Y/N)?           *
                          *
                          *****
```

Figure 7-13. Reset All Channel Cards

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

Backplane Supervisory Bus Submenu

Description The backplane supervisory bus is the pathway over which the SMC and device cards communicate with each other. From the Backplane Supervisory Bus submenu, you can configure bus speed.

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:

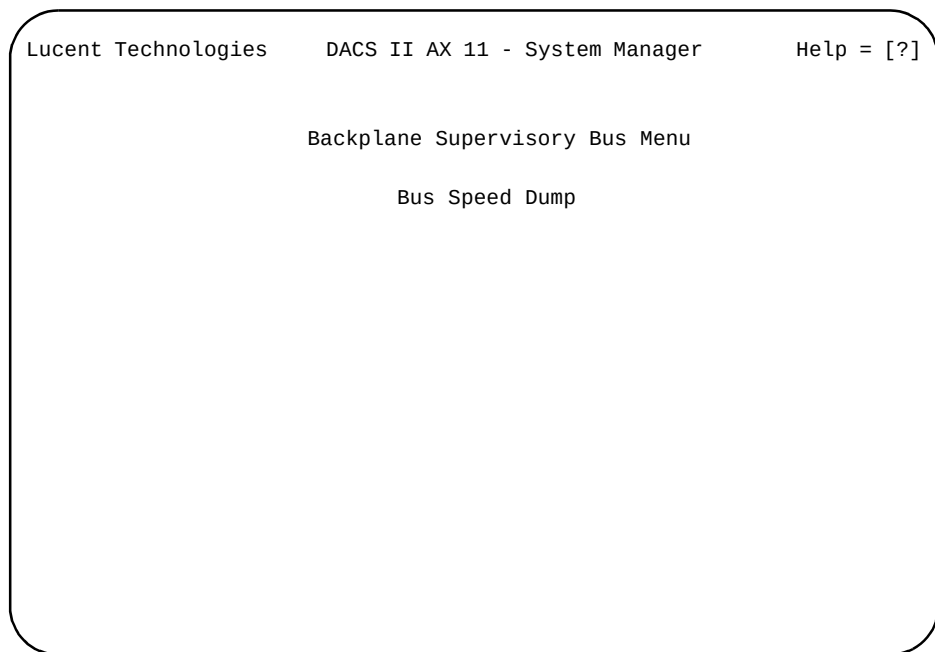


Figure 7-14. Backplane Supervisory Bus - Utilities Menu

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

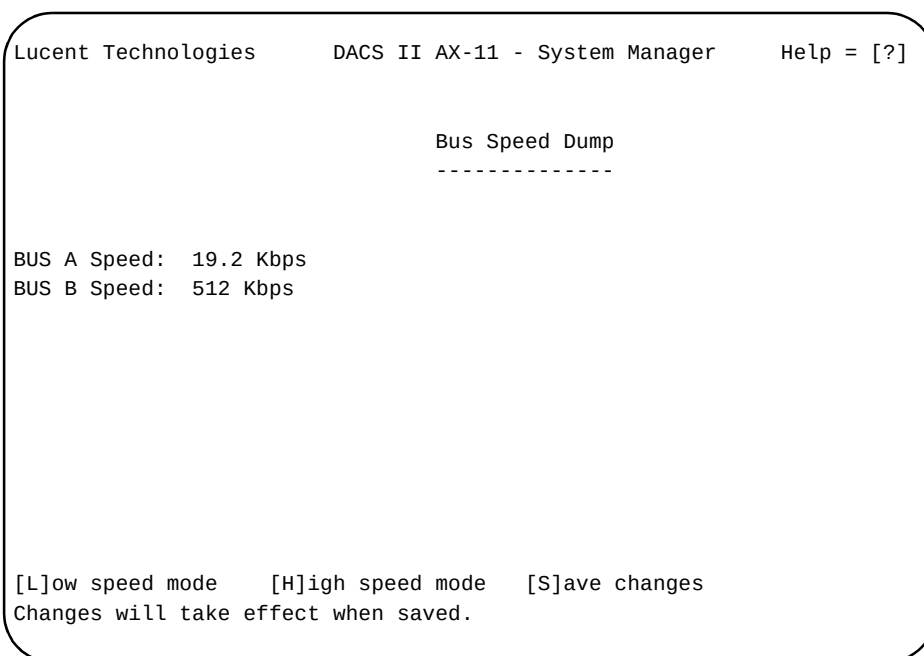


Figure 7-15. Bus Speed Dump Submenu

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.
-

Close All Other Telnet Sessions

Description

The Close All Other Telnet Sessions utility is used as a clear command when one or more Telnet sessions get hung. This command is available only to the Administrator. This utility closes all telnet sessions, except the administrator's Telnet session from which the command is issued.

Procedure

To close all other telnet sessions:

1. From the DACS II AX Main Menu, select *Utilities* then select *Close All Other Telnet Sessions*.

There is no confirmation message.

2. To verify that telnet sessions have been closed:
 - a. Press **X** to exit the *Utilities Menu* and return to the *DACS II AX Main Menu*.
 - b. Select *Events*, then select either *Monitor Events* or *Display Event Log*.

A message appears for each terminated session. See the sample message in the following figure.

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

                        System Events

Seq  Time  Date  Slot  Event
---  ---  ---  ---  -----
0069 14:43 11/13 SMCA LOGIN user - admin (login total: 1)
0068 14:43 11/13 SMCA Telnet: open session# 1
0067 14:27 11/13 SMCA Telnet: terminated session# 1
0066 14:27 11/13 SMCA LOGOUT user - admin (login remains: 0)
0065 10:32 11/13 SMCA LOGIN user - admin (login total: 1)
0064 10:32 11/13 SMCA Telnet: open session# 1
0063 17:56 11/10 SMCA LOGOUT user - admin (login remains: 0)
0062 17:46 11/10 0011 DS3CfgMgr, Nx1 redundancy loaded default
0061 17:46 11/10 0011 Device is in standby state
0060 17:46 11/10 0001 CfgMgr, N+1 redundancy loaded default
0059 17:46 11/10 0001 Device is in standby state
0058 17:46 11/10 0007 Device is in standby state
0057 17:46 11/10 SMCA N+1 Narrowband Redundancy enabled
0056 17:46 11/10 0010 T3 - All tasks are up and running
0055 17:46 11/10 0008 T3 - All tasks are up and running

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

Figure 7-16. Terminated Telnet Session Message

3. To exit this screen and return to the *DACS II AX Main Menu*, press **X** twice.

Contents

■ Background	<u>8-3</u>
■ DACS II AX Clocking Sources	<u>8-4</u>
Clock Source	<u>8-4</u>
Network Synchronized Timing	<u>8-4</u>
DACS II AX Internal Clock	<u>8-6</u>
■ Clocking Example	<u>8-7</u>
Priority Scheme	<u>8-7</u>
■ Configuring the Source Clock	<u>8-9</u>
Procedure	<u>8-9</u>
■ System Clock Source Field Descriptions	<u>8-11</u>
■ Clock Configuration Field Descriptions	<u>8-11</u>

Background

Clocking is an 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 (not recommended)
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.

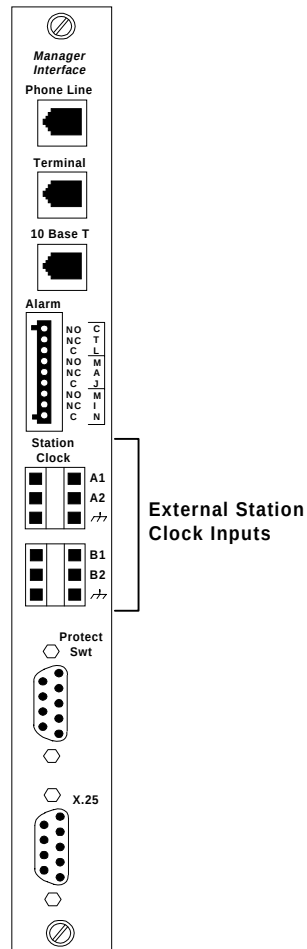


Figure 8-1. External Station Clock Inputs

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.

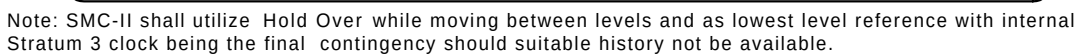


Figure 8-2. Clock Failure and Recovery Process

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.....: Automatic  
  
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.

Contents

■ Overview	9-3
Definition	9-3
■ SMC II Alarm Indicators	9-4
Overview	9-4
SMC II Alarm LEDs	9-5
Alarm Push button	9-5
Alarm Contacts	9-6
■ SMC II Alarm Modes	9-7
Alarm Interface	9-7
Modes	9-7
Alarm Connectors	9-7
Configuring the Alarm Mode	9-7
Standard Mode	9-8
Local Audio Mode	9-9
Toggle Alarm Contacts	9-10
■ Displaying Alarm Detail	9-11
Alarm Column on Node Summary	9-11
■ Displaying Alarm Status for an Application Module	9-12
Procedure	9-12

- Displaying Alarm Status for the N+1 Protection Switch [9-13](#)
 - Procedure [9-13](#)
 - Protection Slot Information Field Descriptions [9-14](#)
- Critical Alarm - Check Node Profile [9-15](#)
- Critical Alarm on SMC [9-16](#)
 - Expose Critical Alarm on SMC [9-16](#)
- Alarm Levels [9-17](#)

Overview

Definition

An *alarm* is an error or problem condition located on a device card, the Protection Switch, or the SMC 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.

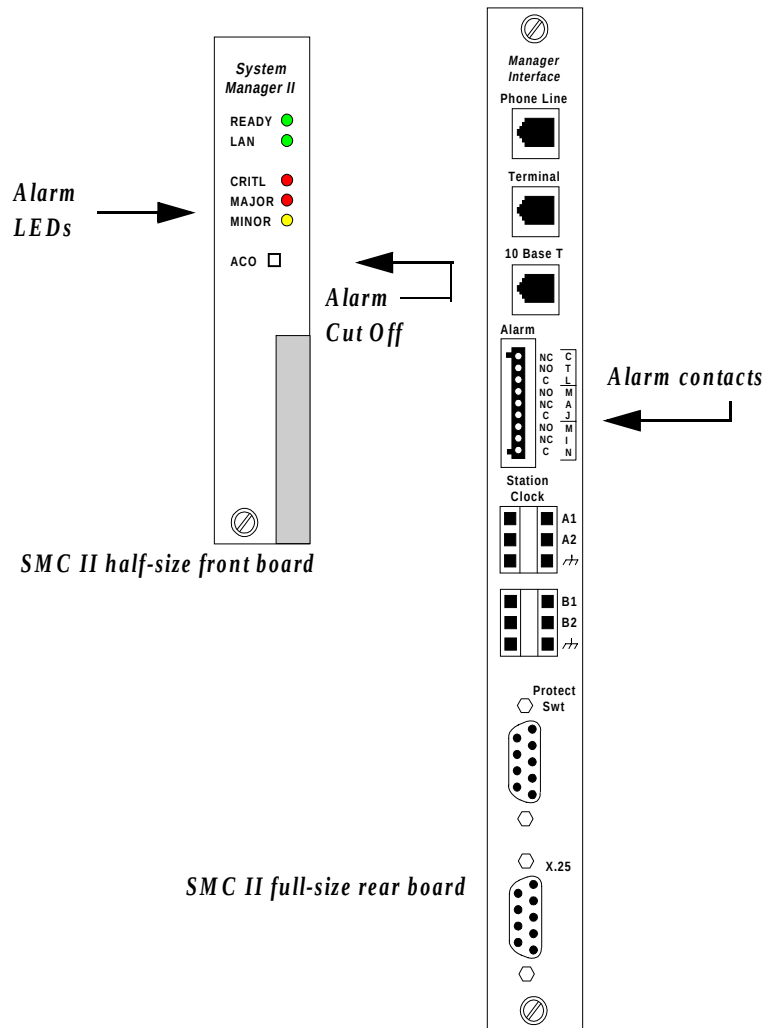


Figure 9-1. SMC II front and rear boards

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 described in the following table.

Alarm Type	Color	Description
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	Reserved for future use.

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.

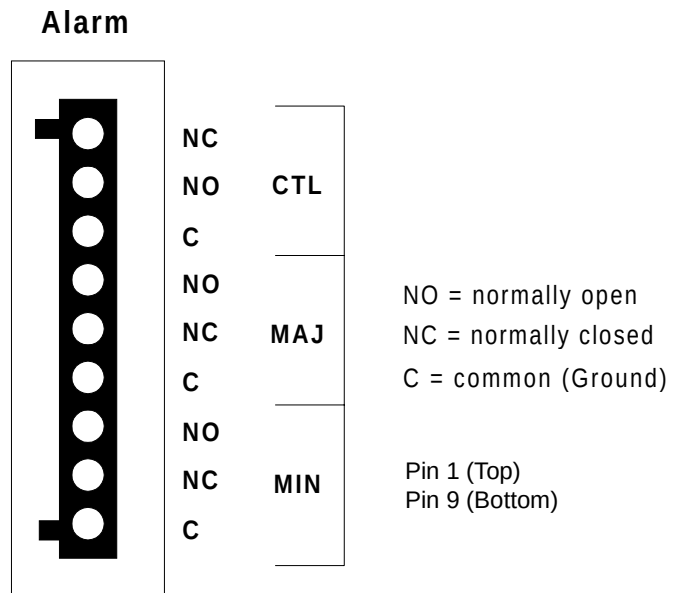


Figure 9-2. SMC II Alarm Contacts

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.

[Table 9-1](#) lists 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)			

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 to drive a Local Audio Alarm module.

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 the alarm condition has been alleviated and then the indicators will clear automatically. [Table 9-2](#) lists the pin assignments for Local Audio Mode.

Table 9-2. 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 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 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**.

Alarm Contacts and Alarm Contact Type shown here.

```

Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
Standby SMC not present      N+1 Redundancy State: Enabled
Alarm Contacts...: Enabled      Alarm Contact Type...: Standard
                                Node Summary Menu

      N+1
Slot#  Group  Configured Type  Device State  Alarm
-----
01     Nb    + Octal T1/E1      Online        None
02     Nb    - Octal T1/E1      Standby       Major
03     Nb    + Octal T1/E1      Online        *None
04     Nb    + Octal T1/E1      Online        None
05     Nb    + Octal T1/E1      Online        None
06     Bb-2  + Hybrid DS3       Online        None
07     Bb-2  + Hybrid DS3       Standby       None
08     Bb-1  + STS-1            Online        None
09     Bb-1  + STS-1            Online        None
10     Bb-1  + STS-1            Online        None
11     Bb-1  + STS-1            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 [P]ort/Link Cfg [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[0]ver [R]estore [E]xpose
  
```

[T]oggle Alarm Contacts allows you to enable or disable the alarm contacts.

Figure 9-3. Node Summary Menu - Alarm Contacts are Enabled

Displaying Alarm Detail

Alarm Column on Node Summary

The Alarm column displayed on the *Node Summary* 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, move the cursor to the slot, SMCA, SMCB or PSX, then press **E**.

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**".

When a failed card switches over to the redundant device, the failed card will have a *Major* alarm, as shown for slot 2 in [Figure 9-3](#).

Displaying Alarm Status for an Application Module

Procedure

To expose an alarm on a device card:

1. From the DACS II AX Main Menu, select *Node Summary*.
2. Place 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: 05 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

In [Figure 9-4](#), there are two critical alarms indicated: the rear interface card is missing and the PSX interface cable is missing. When a device is missing from a slot, then a *Critical* alarm is displayed in the Alarm column on the *Node Summary*. There are no alarms on the port, as shown in the port alarm information at the bottom of the screen.

Displaying Alarm Status for the N+1 Protection Switch

Procedure

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

1. From the DACS II AX Main Menu, select *Node Summary*. Place your cursor on the PSX slot showing a *Critical* and/or *Major* alarm in the Alarm column and press **E**. A screen similar to the one shown in [Figure 9-5](#) appears:

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

                          Protection Slot Information

-----
Device.....: Online
Psx Controller: Rev #1
Chassis.....: Supports Multiple Broadband Groups

-----Major Alarms-----
Power Supply A: Ok
Power Supply B: Fault
Fan 1.....: Ok
Fan 2.....: Ok
Fan 3.....: Ok

                          PSX Interface Card Alarms
01=None      02=None      03=None      04=None      05=None      06=Critical
07=None      08=None      09=None      10=None      11=None
```

Figure 9-5. An Exposed Alarm on the Protection Switch

**Protection Slot
Information
Field Descriptions**

The following fields appear on the Protection Slot Information menu ([Figure 9-5](#)).

Device: Describes the status of the Protection Switch. In [Figure 9-5](#), it is online.

PSX Controller: The Revision number of the PSX Controller card. The Rev 0 controller module or the Rev 1 controller module. The PSX 5300 works with either controller module.

Chassis: The chassis type. This field may display *Undetermined* because a Rev 0 Controller Module cannot determine the chassis type.

Power Supply A, Power Supply B: Describes state of each power supply. A *Major* alarm is generated in the absence of a second Power Supply/

Fan 1, Fan 2, Fan 3: Describes state of each fan in the Protection Switch.

PSX Interface Card Alarms: Displays alarm status of the interface cards in the Protection Switch.

In [Figure 9-5](#), 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 interface card was removed in order to generate the *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 is inaccurate, a Critical alarm will be generated.

See [Node Profile Submenu](#) in Chapter 4, System Configuration for details on entering data on the 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 *DACS II AX Main Menu*, select *Node Summary*.
2. Place the cursor on the *SMCA* or *SMCB* slot showing a *Critical* and/or *Major* alarm in the Alarm column and press **E**.

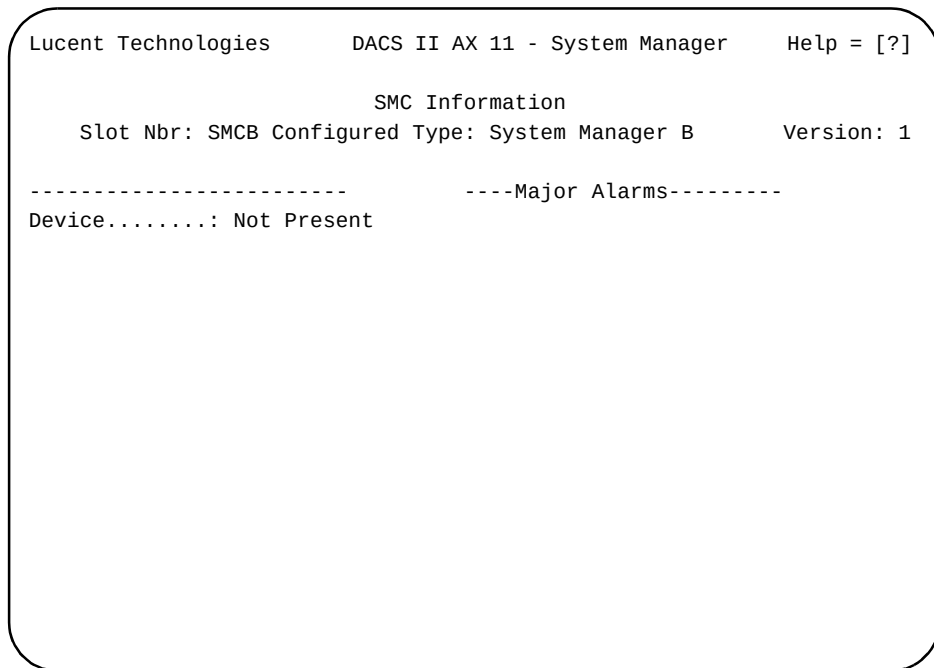


Figure 9-6. An exposed alarm on the SMCB

As shown in [Figure 9-6](#), 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 9-3. 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 9-4. 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 9-5. 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 9-6. DS3 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 9-7. 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 9-8. 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 9-9. 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 9-10. Octal Voice Port Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Configuration error		X		X
Out of service				X

Table 9-11. Router Port Alarms

DESCRIPTION	CRITICAL ALARM	MAJOR ALARM	MINOR ALARM	SNMP TRAP
Configuration error		X		X
Out of service				X

Alarm Levels (Continued)

Table 9-12. 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 9-13. Hybrid DS3 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 9-14. 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 9-15. 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 9-16. 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

Contents

■ Background	<u>10-5</u>
Purpose	<u>10-5</u>
Objectives	<u>10-5</u>
Related Information	<u>10-5</u>
■ Terms Used	<u>10-6</u>
■ Regulatory Information	<u>10-7</u>
North America	<u>10-7</u>
FCC Customer Information	<u>10-7</u>
Industry Canada Statement	<u>10-8</u>
Product Safety	<u>10-8</u>
Europe	<u>10-9</u>
■ Overview	<u>10-10</u>
Definition	<u>10-10</u>
N+1 Protection Switch Models	<u>10-10</u>
Physical Description	<u>10-11</u>
Requirements	<u>10-12</u>
Connectors	<u>10-13</u>
Types of Redundancy	<u>10-14</u>
PSX 5300 - Slot Assignments	<u>10-14</u>

PSX 5200 - Slot Assignments	<u>10-16</u>
■ Sample Configuration	<u>10-17</u>
Sample Layout	<u>10-17</u>
Parts of the N+1 Protection Switch	<u>10-18</u>
Cables from N+1 Protection Switch to DACS II AX	<u>10-19</u>
Parts of the DACS II AX	<u>10-20</u>
■ Setting Up Redundancy - Overview	<u>10-21</u>
Procedural Overview	<u>10-21</u>
■ Verify Node Profile Settings	<u>10-22</u>
Purpose	<u>10-22</u>
Procedure	<u>10-22</u>
Node Profile Field Descriptions	<u>10-23</u>
■ Enable Redundancy for Modules	<u>10-24</u>
Description	<u>10-24</u>
Procedure	<u>10-24</u>
■ Set the Protection Switch Options	<u>10-26</u>
Description	<u>10-26</u>
Procedure	<u>10-26</u>
■ Verifying Slot Information on Node Summary	<u>10-28</u>
Description	<u>10-28</u>
Procedure	<u>10-28</u>
■ Displaying Detailed Redundancy Status Information per Slot	<u>10-30</u>
Description	<u>10-30</u>
Procedure	<u>10-30</u>
N +1 Redundancy Status Menu Field Descriptions	<u>10-32</u>
■ Switchover	<u>10-33</u>
Definition	<u>10-33</u>
Types of Switchover	<u>10-33</u>
Switchover Criteria	<u>10-33</u>
Manual Switchover	<u>10-33</u>
Automatic Switchover	<u>10-34</u>
Conditions for Automatic Switchover	<u>10-34</u>
Automatic Switchover Settings	<u>10-35</u>
■ Restoring after a Switchover	<u>10-36</u>
Definition	<u>10-36</u>
Manual Restore	<u>10-36</u>

■ Protection Switch Main Menu	<u>10-37</u>
Access Protection Switch Main Menu	<u>10-37</u>
Protection Switch Main Menu Options	<u>10-37</u>
■ Protection Switch Status Menu	<u>10-38</u>
Field Descriptions	<u>10-38</u>
■ N+1 Protection Switch Alarms	<u>10-40</u>
Access Menu	<u>10-40</u>
Protection Slot Information Menu Field Descriptions	<u>10-41</u>
■ Protection Switch Utilities Menu	<u>10-42</u>
Purpose	<u>10-42</u>
■ Protection Switch About Menu	<u>10-43</u>
Purpose	<u>10-43</u>
■ Changing the Fan Setting	<u>10-44</u>
Procedure	<u>10-44</u>
■ Cleaning/Changing the Air Filter	<u>10-46</u>
Description	<u>10-46</u>
Required Tools	<u>10-46</u>
Procedure	<u>10-46</u>
■ Changing the Fan Assembly	<u>10-48</u>
Description	<u>10-48</u>
Procedure	<u>10-48</u>

Background

Purpose The chapter explains 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 one or two redundancy groups 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 redundant device manually or automatically
- List the error conditions that will cause an automatic switchover to the redundant 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

Terms Used

Controller Card - provides communications between the SMC II in the DACS II AX 11 and the N+1 Protection Switch.

Primary Device - a device in a 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 5200 - N+1 Protection Switch that supports one narrowband and one broadband group.

PSX 5300 - N+1 Protection Switch that supports one narrowband and two broadband groups.

Redundant Device - one device in a 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 one redundant device.

Restore - an action that the user initiates to return traffic to a primary device that was being protected by a redundant device in the same redundancy group.

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.

Regulatory Information

North America

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.

In order for the DACS II AX and the N+1 Protection Switch to remain compliant with the various emissions regulations, unpopulated slots in the chassis should be covered with blank panels.

For Regulatory Information on individual DACS II AX application modules, refer to the chapter for the module.

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 Lucent Technologies. 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.

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) technical publications UL 1950, Third Edition, CAN/CSA-C22.2 No. 950-95, Third Edition, and EN60950:1992.

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

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.

Overview

Definition

The N+1 Protection Switch is a unit that can be used with the DACS II AX 11 to provide the capability to switch in a redundant application module when a broadband or narrowband application module becomes non-operational or has a critical error. There is one redundant application module for each group of protected modules.

N+1 Protection Switch Models

There are two models of the N+1 Protection Switch:

- **PSX 5200:** Requires DACS II AX Release 9.01 or higher. Supports one narrowband and one broadband redundancy group.
- **PSX 5300:** Requires DACS II AX Release 10.0. Supports up to one narrowband and two broadband redundancy groups. Has a revised controller module (Rev 1).

The Rev 1 and Rev 0 controller modules can be installed in either chassis. If the Rev 0 controller module is installed in the PSX 5300, it can be provisioned to support the additional broadband bus with the PSX 2.0 software. The Rev 1 controller module should automatically detect whether it has been installed in the earlier PSX 5200 chassis or the newer PSX 5300.



NOTE:

To avoid Critical alarms, make sure the **N+1 Chassis Type** is properly identified on the Node Profile menu.

**Physical
Description**

The N+1 Protection Switch is a separate unit from the DACS II AX. Both models, the PSX 5200 and the PSX 5300 have the same appearance. 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. The interface cards are physically connected by primary or standby adapter cables to the DACS II AX.
 - One slot for the **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 is -48 Vdc +/- 10%. Max. 48 W, 1.2 A. 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:

- Software Release 10.0 for PSX 5300. Software Release 9.01 or higher for PSX 5200.
 - SMC II
 - Modules to be protected: Octal T1/E1, T3, hybrid DS-3, or STS-1 modules
-

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*.

Overview (Continued)

Types of Redundancy

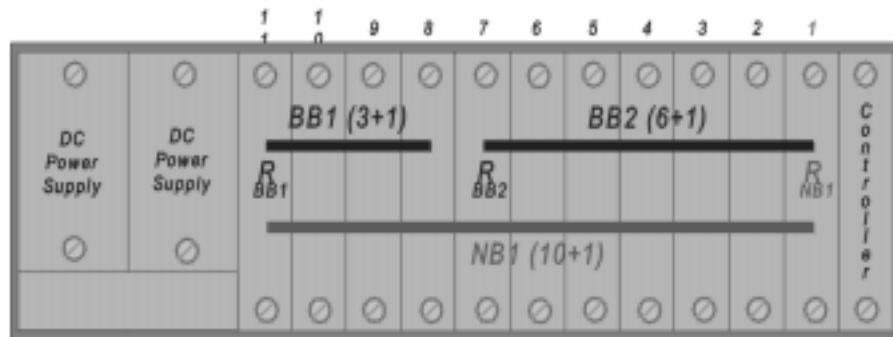
The N+1 Protection Switch can be equipped for narrowband or broadband redundancy groups:

- **Narrowband Redundancy Group** - The Octal T1/E1 module is the narrowband application module. Up to 10 primary Octal T1/E1 modules can be protected.
- **Broadband Redundancy Group** - There are three types of broadband modules: DS3, hybrid DS-3, and STS-1. All modules in a broadband redundancy group must be the same type. For example, for STS-1, the primary and the redundant application modules must be STS-1.

The PSX 5200 can support one broadband redundancy group and the PSX 5300 can support two.

PSX 5300 - Slot Assignments

When the DACS II AX is equipped with the PSX 5300, the DACS II AX can be configured for narrowband redundancy and two groups of broadband redundancy. Refer to the following figure and table for slot assignments.



KEY

BB1 = Broadband Group 1
BB2 = Broadband Group 2
NB1 = Narrowband Group 1
R = Redundant Device

Figure 10-2. PSX 5300 Rear View - Slot Assignments for Redundancy

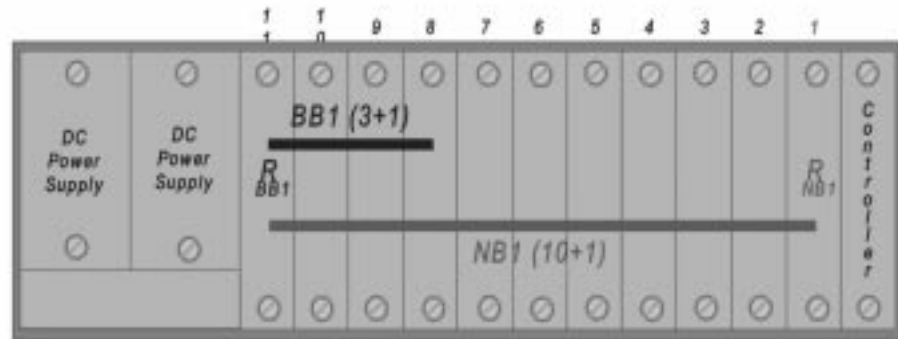
Table 10-1 shows the maximum number of protected modules, given that all the slots available for a broadband group are used.

Table 10-1. PSX 5300 Slot Assignments for Redundancy

Redundancy Groups	Slots Available for Primary Modules	Slot for Redundant Module	Maximum Number of Protected Modules
Narrowband ONLY	2 - 11	1	10
Broadband Group 2 ONLY	1-6	7	6
Broadband Group 1 ONLY	8 - 10	11	3
Narrowband Broadband Group 1	2 - 7 8 -10	1 11	6 3
BOTH BROADBAND ONLY Broadband Group 2 Broadband Group 1	1-6 8-10	7 11	6 3 Total: 9

PSX 5200 - Slot Assignments

When the DACS II AX is equipped with the PSX 5200, the DACS II AX can be configured for one narrowband and one broadband redundancy group. Refer to the following figure and table for slot assignments.



KEY

BB1 = Broadband Group 1
 NB1 = Narrowband Group 1
 R = Redundant Device

Figure 10-3. PSX 5200 Rear View - Slot Assignments for Redundancy

Table 10-2 shows the maximum number of protected modules, given that all the slots available for a broadband group are used.

Table 10-2. PSX 5200 Slot Assignments for Redundancy

Redundancy Groups	Slot for Redundant Module	Slots Available for Primary Modules	Maximum Number of Protected Modules
Narrowband ONLY	1	2 - 11	10
Broadband ONLY	11	8 - 10	3
BOTH			
Narrowband	1	2 - 7	6
Broadband	11	8 - 10	3

Sample Configuration

Sample Layout

[Figure 10-4](#) shows an example of a DACS II AX with an N+1 Protection Switch which has an Octal T1/E1 redundancy group and a hybrid DS-3 redundancy group. This configuration could be implemented with either the PSX 5200 or the PSX 5300.

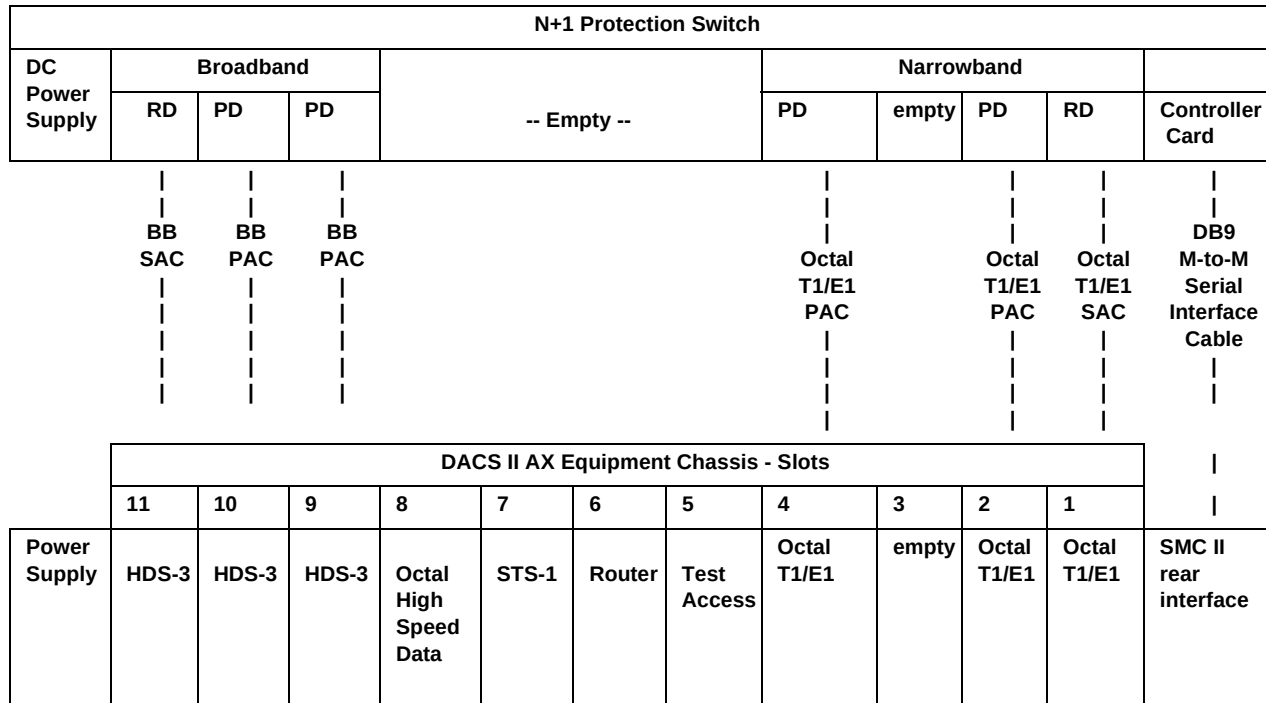


Figure 10-4. Sample Configuration of DACS II AX with Protection Switch (Rear View)

Sample Configuration (Continued)

Parts of the N+1 Protection Switch

The following table list the parts of the Protection Switch shown in [Figure 10-4](#).

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 broadband card. The Redundant Device is connected to the redundant card in Slot 11 of the DACS II AX. *
Broadband - PD	Primary Device. A Primary Device is connected to each of the hybrid DS-3 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 redundant Octal T1/E1 card in Slot 1 of the DACS II AX.
Controller Card	Provides communication between SMC II in the DACS II AX 11 and the protection switch.

* The supported broadband modules are hybrid DS-3, DS-3, and STS-1.

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 10-4](#).

Cable	Description
BB SAC	The Broadband Secondary Adapter Cable connects the redundant device in the Protection Switch to the application module in Slot 11. *
BB PAC	The Broadband Primary Adapter Cable connects the primary device in the Protection Switch to the hybrid DS-3 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.
* The supported broadband modules are hybrid DS-3, DS-3, and STS-1. The broadband modules use the same primary adapter cables and secondary adapter cables.	

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 10-4](#).

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 redundant 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.
HDS-3 modules in slots 9 and 10	The HDS-3 modules in the DACS II AX that are active and online under normal operation. To be protected, these modules must be part of the HDS-3 redundancy group and be located in any slot 8-10.
HDS-3 module in slot 11	The redundant module that can be manually or automatically switched in to take over for a failed HDS-3 module that is part of the HDS-3 redundancy group.
SMC II Rear Interface	Connected to the Protection Switch's Controller Card via a DB9 Serial Interface Cable.

Setting Up Redundancy - Overview

Procedural Overview

To set up redundancy, complete these tasks:

Task	Select	See Procedure on Page
Verify Node Profile Settings	Node Profile from the System Configuration menu	10-22
Enable Redundancy for Modules	Slot Configuration from the System Configuration menu	10-24
Set Protection Switch Options	Slot Configuration from the System Configuration menu	10-26
Verify Slot Information on Node Summary	Node Summary from the DACS II AX Main Menu	10-28
Verify Redundancy Information per Slot	Node Summary, select a slot, select N+1 Redundancy, then select Device Redundancy	10-30

Verify Node Profile Settings

Purpose Use Node Profile to identify the installed hardware and verify N+1 Redundancy settings.

Procedure To verify Node Profile information, follow these steps:

1. Select *System Configuration* from the *DACS II AX Main Menu*.
2. Select *Node Profile*.
3. Specify options. See [Node Profile Field Descriptions](#).
4. Type **X**. To confirm action when prompted, press **Y**. Changes are saved and you are returned to the previous menu.

[Figure 10-5](#) shows a completed Node Profile menu for a node that has two broadband and a narrowband protection group. If the node does not support redundancy or it does not support two broadband groups, some fields will not appear on the Node Profile menu.

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 following configuration details:

```
Node name: default node name

Dual System Mgr.....: Yes
Alarm Contact Type.....: Standard

N+1 Redundancy Node.....: Yes
N+1 Chassis Type.....: 5300
Protection Switch Dual Power.....: No
N+1 Redundancy Narrowband Group.....: Octal T1/E1
N+1 Redundancy Broadband Group 1.....: DS3
Protection Switch Dual Broadband Groups: Yes
N+1 Redundancy Broadband Group 2.....: STS1
```

Figure 10-5. 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.

Dual System Mgr (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**. If you do not have a second SMC, 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.

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**. If you do not have redundancy, set this field to **No** or else a *Critical Alarm* will be triggered. If you select **No**, no other fields appear on this menu.

N+1 Chassis Type (option field) This field appears if Yes is selected in the N+1 Redundancy Node field. Select **5200** or **5300**. If the redundancy chassis is improperly identified, you will receive *Critical* alarms.

Protection Switch Dual Power (option field) Select **Yes** or **No**. Yes confirms that you have two power supplies in the protection switch. The default setting is **Yes**.

If	And, you incorrectly set	Then
You do NOT have a second power supply	Protection Switch Dual Power to Yes	Critical Alarm will result
You DO have a second power supply	Protection Switch Dual Power to No	You will get an SNMP trap, but no alarm.

N+1 Redundancy Narrowband Group (display field) This field automatically displays Octal T1/E1 as the supported narrowband group.

N+1 Redundancy Broadband Group 1 (option field) If you are using broadband group 1(slots 8-10, with 11 for the redundant module), indicate which type of broadband modules will be protected: DS3, HDS-3, or STS1.

Protection Switch Dual Broadband Groups (option field) Select **Yes** or **No**. If you select **No**, no other fields appear on the Node Profile Menu.

N+1 Redundancy Broadband Group 2 (option field) If you are using broadband group 2 (slots 1-6, with 7 for the redundant module), indicate which type of broadband modules will be protected: DS3, HDS-3, or STS1.

Enable Redundancy for Modules

Description

Enable redundancy for each module that is to be included in a redundancy group. This includes all modules to be protected, and the redundant module for each redundancy group



NOTE:

During initial set-up, **N+1 Redundancy** should be set to *Disabled*. Enable redundancy for the modules, then set **N+1 Redundancy** to *Enabled*.

Procedure

To enable redundancy for a module:

1. From the DACS II AX Main Menu, select *System Configuration*, then select *Slot Configuration*. The Slot Configuration Menu displays ([Figure 10-6](#)).

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

Slot Configuration Menu

Slot#	Device Type	Name	Redundancy
-----	-----	-----	-----
1	Octal T1/E1	Redundant1	Enable
2	Octal T1/E1	BERT test	Enable
3	Octal T1/E1	Loop One	Enable
4	Octal T1/E1	Loop Two	Enable
5	Octal T1/E1	Loop Three	Enable
6	Hybrid DS-3	Loop Four	Enable
7	Hybrid DS-3	Redundant7	Enable
8	STS-1	Primary S8	Enable
9	STS-1	Primary S9	Enable
10	STS-1	Primary S10	Enable
11	STS-1	Redundant11	Enable

N+1 Redundancy: Disabled

N+1 Redundancy Switchover: Automatic

N+1 Redundancy Restore: Manual

Change Card = [Enter key]
[D]elete Card
[P]ort/Link Cfg

Figure 10-6. 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: _____
Card type: STS1
Redundancy: Disable

Figure 10-7. Slot Configuration Screen

3. Type in a Slot name.
 4. Select Octal T1/E1, DS3, HDS-3, or STS1 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 8 for each module to be included in a redundancy group.
 10. When a module has been enabled for redundancy, the redundancy group (Nb, Bb-2, or Bb-1) and a plus sign (+) appears for the slot on the Node Summary menu. See [Figure 10-8](#).
-

Set the Protection Switch Options

Description

There are three options which need to be set for the Protection Switch 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 these steps:

1. From the DACS II AX Main Menu, select *System Configuration*, then select *Slot Configuration*.
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 10-7](#)), it corresponds with the **N+1 Redundancy State** on the *Node Summary Menu* ([Figure 10-8](#)). If **N+1 Redundancy** is *Enable* on the *Slot Configuration Menu*, and the **N+1 Redundancy State** 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 Auto** - This setting enables a switchover to automatically occur on just the narrowband devices in a Narrowband Redundancy Group.
 - **Broadband Auto 1** - This setting enables a switchover to automatically occur on just the primary broadband devices located in slots 8-10 in a Broadband 1 Redundancy Group.
 - **Broadband Auto 2** - This setting enables a switchover to automatically occur on just the primary broadband devices located in slots 1-6 in a Broadband 2 Redundancy Group.
 - **Automatic** - This setting enables a switchover to automatically occur on an established Redundancy Group.

- **Manual** - A switchover will not occur until the operator does so manually.

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 Slot Information on Node Summary

Description Verify the redundancy information that appears on the Node Summary Menu for each of the application modules in the DACS II AX.

Procedure To verify the redundancy information in the DACS II AX, complete these steps:

1. From the *DACS II AX Main Menu*, select *Node Summary*. The Node Summary Menu displays ([Figure 10-8](#)).

```

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

                                Node Summary Menu

      N+1
Slot#  Group  Configured Type  Device State  Alarm
-----
01     Nb    + Octal T1/E1     Online        None        Clock Src
02     Nb    - Octal T1/E1     Standby       *Major
03     Nb    + Octal T1/E1     Online        *None
04     Nb    + Octal T1/E1     Online        None
05     Nb    + Octal T1/E1     Online        None
06     Bb-2  + Hybrid DS3      Online        None
07     Bb-2  + Hybrid DS3      Standby       None
08     Bb-1  + STS-1           Online        None
09     Bb-1  + STS-1           Online        None
10     Bb-1  + STS-1           Online        None
11     Bb-1  + STS-1           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 [P]ort/Link Cfg [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver [R]estore [E]xpose

```

Figure 10-8. 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. Verify the information in the N+1 Group column.

The **N+1 Group** column displays the redundancy group that the module is in:

NB = Narrowband

Bb-2 = Broadband Group 2

Bb-1 = Broadband Group 1

4. 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 field on 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. In [Figure 10-8](#), the card in Slot 2 has a minus (-) sign. The **Device State** column shows that the redundant device in Slot 1 is On-line and actively protecting the failed device in Slot 2 of the Octal T1/E1 Redundancy Group.

5. 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 a module in a redundancy group:

1. From the Node Summary Menu, select a module that is in the redundancy group and press **<Enter>**. The module's Main Menu displays ([Figure 10-9](#)):

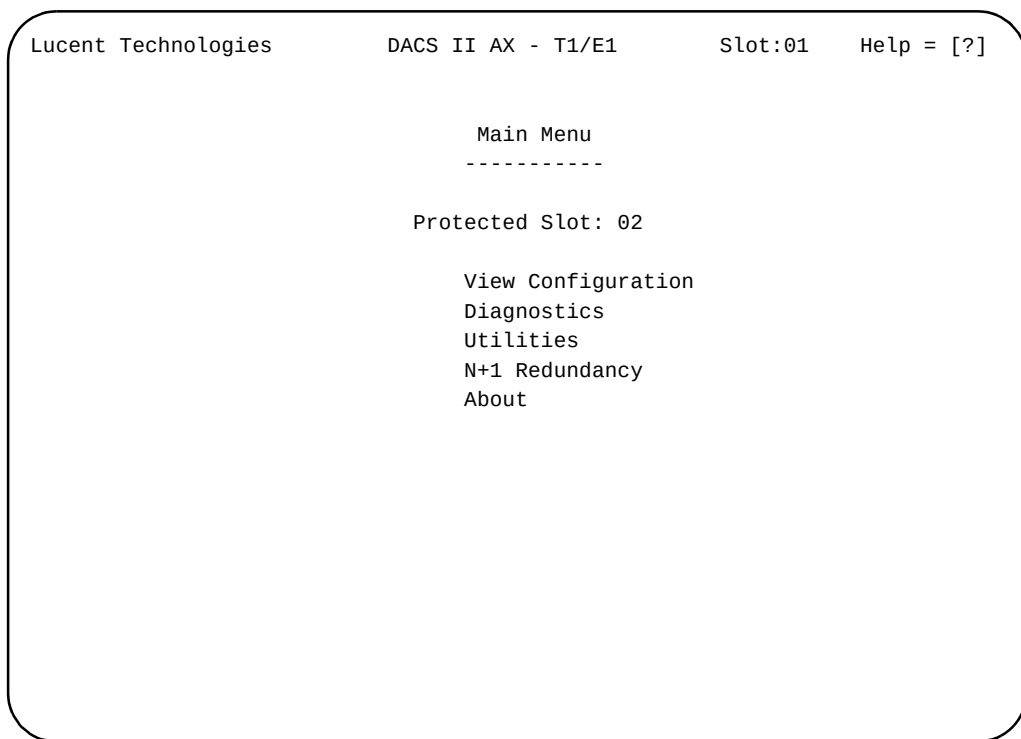


Figure 10-9. Octal T1/E1 Main Menu

The Main Menu shows the following:

- **Protected Slot:** This field appears only for a redundant device. If a switchover has occurred, the Protected Slot field lists the device that is being protected. If a switchover had not occurred, the Protected Slot field would read *none*.
- **Menu Options:** The *Configuration*, *Diagnostics*, *Utilities*, and the *About* submenus are described in the application module's chapter in this module.



NOTE:

Do not change the configuration information for a redundant module. Configuration information is gotten from the slot that is being protected when a switchover occurs.

2. To view redundancy details for aL slot, from the module's Main Menu, select N+1 Redundancy. The N+1 Redundancy Menu displays [\(Figure 10-10\)](#). Note that the Protected Slot field is displayed only for a redundant module.

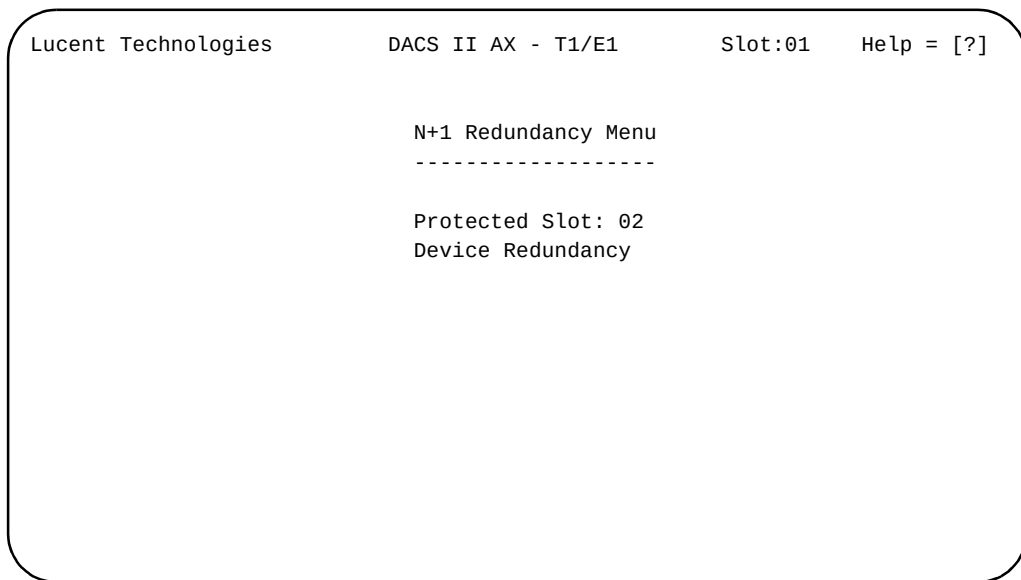


Figure 10-10. N+1 Device Redundancy Menu

3. Select *Device Redundancy*. The N+1 Redundancy Status Menu displays ([Figure 10-11](#)). Refer to the field descriptions in the following section.

```

Lucent Technologies          DACS II AX - T1/E1          Slot:01    Help = [?]

                                N+1 Redundancy Status Menu

Member of Redundancy Group...: Yes
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 10-11. N+1 Redundancy Status Menu

In [Figure 10-11](#) the redundant Octal T1/E1 module in slot 1 is Online. The protected slot is Slot 2 ([Figure 10-10](#)).

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 redundant card that is available should a primary card fail.

Device State: Online or Offline. Online means the card is passing traffic. In [Figure 10-11](#), the secondary card is *Online*. 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. The system may not respond properly.

Types of Switchover

A switchover can be done manually or automatically.

Switchover Criteria

The Protection Switch can detect a hardware failure and automatically switch in a redundant 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.
-

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 (Continued)

Automatic Switchover

The protection switch can be set to switch automatically from a failed primary device to the secondary device in a redundancy 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 a 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 Auto** - This setting enables a switchover to automatically occur on just the narrowband devices in a Narrowband Redundancy Group.
 - **Broadband Auto 1** - This setting enables a switchover to automatically occur on just the primary broadband devices located in slots 8-10 in a Broadband 1 Redundancy Group.
 - **Broadband Auto 2** - This setting enables a switchover to automatically occur on just the primary broadband devices located in slots 1-6 in a Broadband 2 Redundancy Group.
 - **Automatic** - This setting enables a switchover to automatically occur on an established Redundancy Group.
-

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

Access Protection Switch Main Menu

On the Node Summary, 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 [\(Figure 10-12\)](#).

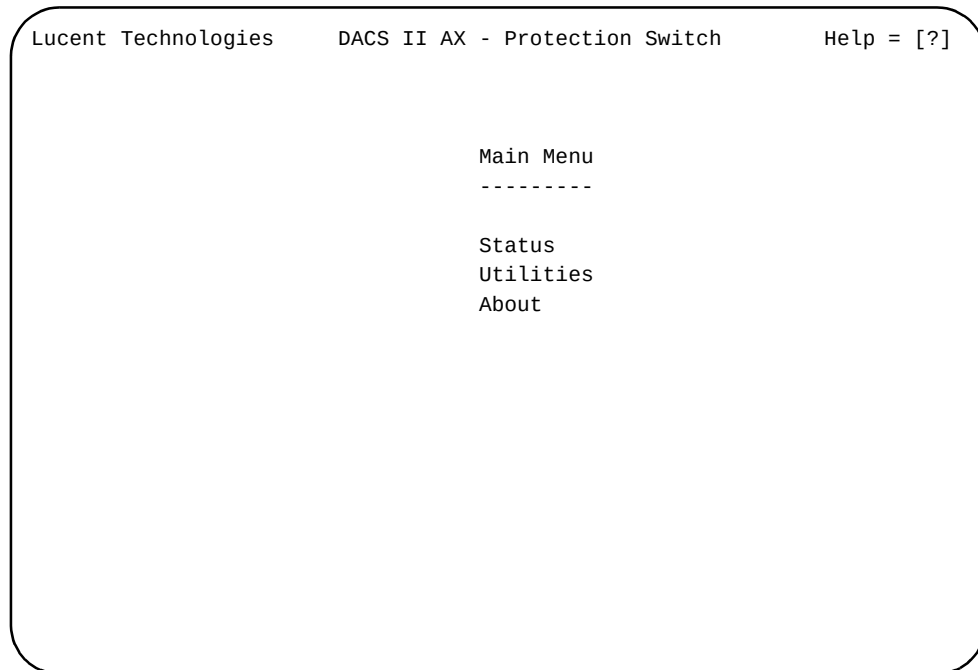


Figure 10-12. Protection Switch Main Menu

Protection Switch Main Menu Options

There are three options on the Protection Switch Main Menu:

- From the **Status** menu, you can view the status of the Protection Switch, whether a device has been switched, which slot a redundant device is protecting, and if a 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.

Protection Switch Status Menu

The Protection Switch Status menu ([Figure 10-13](#)) displays the status of the cards in the Protection Switch.

```

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

                                Status Menu
                                -----

Slot#   Card Type             Card Status   Switch State   Switch Status
-----
01      Narrowband Redundant   Ok            Switched       protect slot 02 Ok
02      Narrowband Primary     Ok            Switched       Ok
03      Narrowband Primary     Ok            Normal         Ok
04      Narrowband Primary     Ok            Normal         Ok
05      Narrowband Primary     Ok            Normal         Ok
06      Broadband '2' Primary  Ok            Normal         Ok
07      Broadband '2' Redundant Ok            Normal         Ok
08      Broadband '1' Primary  Ok            Normal         Ok
09      Broadband '1' Primary  Ok            Normal         Ok
10      Broadband '1' Primary  Ok            Normal         Ok
11      Broadband '1' Redundant Ok            Normal         Ok

Power Supply A Status.: Fault      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 10-13. Protection Switch Status Menu

Field Descriptions The following fields appear on the Protection Switch Status Menu.

Slot#: The Slot Number in the Protection Switch.

Card Type: The type of interface card that is in the slot: Narrowband Redundant, Narrowband Primary, Broadband 2 Primary, Broadband 2 Redundant, Broadband 1 Primary, Broadband 1 Redundant, or Card Not Present.

Card Status: The status will either be *Ok*, *Cable Missing* or *Not Present*.

Switch State: Displays the status of the relay switch. The status will either be *Normal* or *Switched*.

Switch Status: This field notes 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.*

Power Supply A Status: Displays the status of the power supply in the N+1 Protection Switch. It will either register *OK* or *Fault*.

Power Supply B Status: Displays the status of the power supply in the N+1 Protection Switch. It will either be *OK* or *Fault*.

Chassis Temperature: Detects and controls the ambient temperature of the N+1 Protection Switch and DACS II AX 11.

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 affect the air flow through the DACS II AX, which will increase the temperature.

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 room ambient 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°C (86°F)
- **Medium** - 30°C (86° F) to 40°C (104°F)
- **High** - above 40°C (104°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:

It is recommended to set **Fan Maintenance** to *Auto*.

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*.

N+1 Protection Switch Alarms

Access Menu

To display a summary of the state of the Protection Switch hardware, from the *Node Summary*, move the cursor to PSX and press **E**. The following menu displays.

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

                        Protection Slot Information

-----
Device.....: Online
Psx Controller: Rev #1
Chassis.....: Supports Multiple Broadband Groups

                        ----Major Alarms---
Power Supply A: Ok
Power Supply B: Fault
Fan 1.....: Ok
Fan 2.....: Ok
Fan 3.....: Ok

                        PSX Interface Card Alarms
01=None      02=None      03=None      04=None      05=None      06=None
07=None      08=None      09=None      10=None      11=None
```

Figure 10-14. An Exposed Alarm on the Protection Switch

**Protection Slot
Information Menu
Field Descriptions**

The following fields appear on the Protection Slot Information menu ([Figure 10-14](#)).

Device: Describes the status of the Protection Switch. In [Figure 10-14](#), it is online.

PSX Controller: The Revision number of the PSX Controller card. The Rev 0 controller module or the Rev 1 controller module. The PSX 5300 works with either controller module.

Chassis: The chassis type. The chassis may be *Undetermined* because a Rev 0 Controller Module cannot determine the chassis type.

Power Supply A, Power Supply B: Describes state of each power supply. A *Major* alarm is generated in the absence of a second Power Supply.

Fan 1, Fan 2, Fan 3: Describes state of each fan in the Protection Switch.

PSX Interface Card Alarms: Displays alarm status of the interface cards in the Protection Switch.

Protection Switch Utilities Menu

Purpose

Use the Reset Board option to reset the Protection Switch Controller Card. 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.



WARNING:

Resetting the Protection Switch Controller Card causes ALL service to be interrupted.

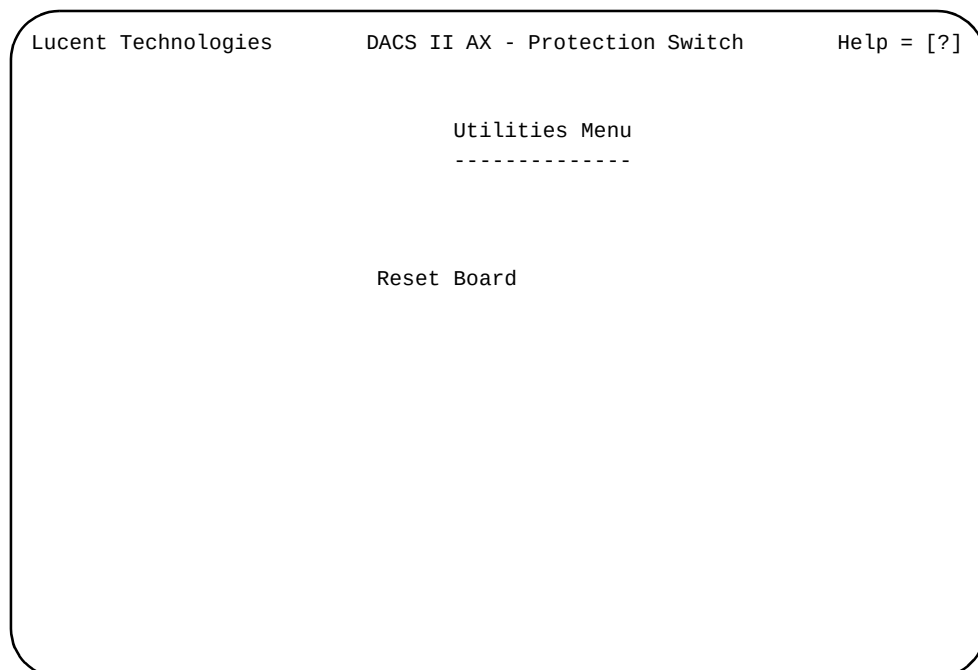


Figure 10-15. Protection Switch Utilities Menu

Protection Switch About Menu

Purpose

Use the About Menu to display information about the rear card hardware revision and the software revision level of the Protection Switch Controller Card. From the About Menu, you can also determine if a rear card is present or if two broadband groups have been enabled.

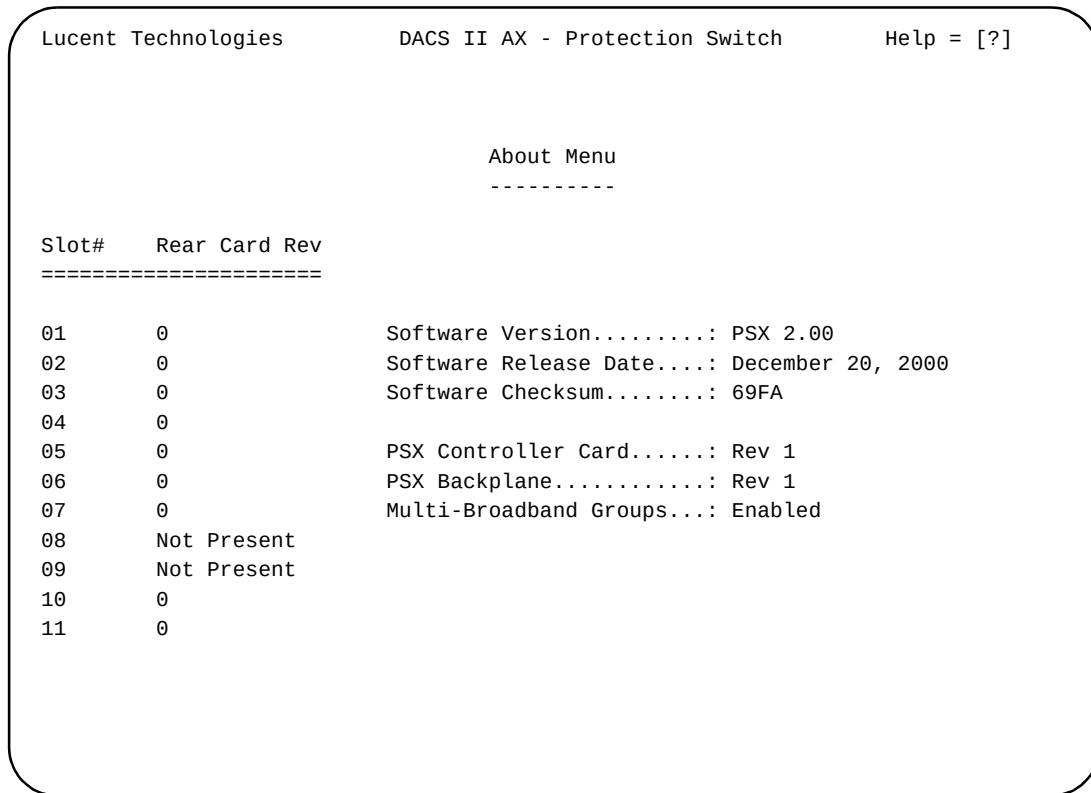


Figure 10-16. Protection Switch About Menu

Changing the Fan Setting

Procedure

To change the fan setting:

1. From the DACS II AX Node Summary Menu, select *PSX*.

From the N+1 Protection Switch Main Menu, select *Status*. The following menu appears:

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

```

                                Status Menu
                                -----

```

Slot#	Card Type	Card Status	Switch State	Switch Status
01	Narrowband Redundant	Ok	Switched	protect slot 02 Ok
02	Narrowband Primary	Ok	Switched	Ok
03	Narrowband Primary	Ok	Normal	Ok
04	Narrowband Primary	Ok	Normal	Ok
05	Narrowband Primary	Ok	Normal	Ok
06	Broadband '2' Primary	Ok	Normal	Ok
07	Broadband '2' Redundant	Ok	Normal	Ok
08	Broadband '1' Primary	Ok	Normal	Ok
09	Broadband '1' Primary	Ok	Normal	Ok
10	Broadband '1' Primary	Ok	Normal	Ok
11	Broadband '1' Redundant	Ok	Normal	Ok

```

Power Supply A Status.: Fault      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 10-17. N+1 Protection Switch Status Menu

2. 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.

Cleaning/Changing the Air Filter

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/change 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](#).
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 10-18. Front of N+1 Protection Switch with 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](#).
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.

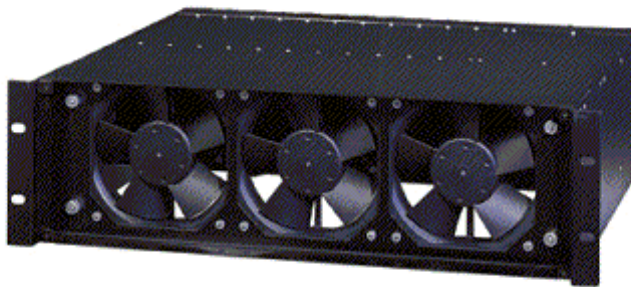


Figure 10-19. Front View of Fan Assembly

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*.
-

Contents

■ Physical Description	<u>11-5</u>
■ Regulatory Information	<u>11-6</u>
North America	<u>11-6</u>
FCC Customer Information	<u>11-6</u>
Industry Canada Statement	<u>11-7</u>
■ Product Safety	<u>11-9</u>
Underwriters' Laboratories	<u>11-9</u>
Europe	<u>11-9</u>
■ Before You Begin	<u>11-10</u>
Notes about the DS-1 Module	<u>11-10</u>
■ Configure Slot for Quad DS-1	<u>11-11</u>
Configure Slot	<u>11-11</u>
■ Configure DS-1 Ports	<u>11-12</u>
Description	<u>11-12</u>
Before You Begin	<u>11-12</u>
Procedure - Configure Ports	<u>11-12</u>
LEDS Display	<u>11-14</u>
Configuration Menu Field Descriptions	<u>11-14</u>
■ Quad DS-1 Main Menu	<u>11-16</u>

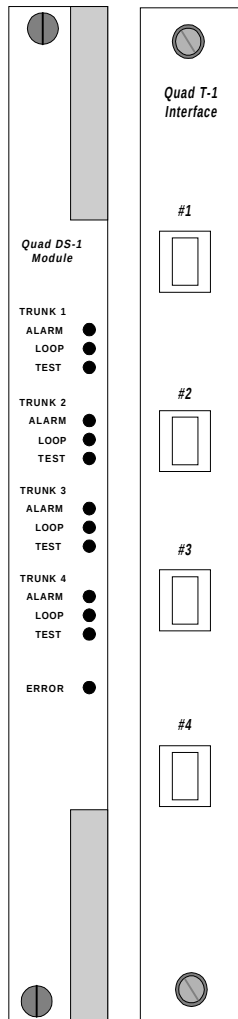
Access DS-1 Main Menu	<u>11-16</u>
■ View Configuration	<u>11-17</u>
Purpose	<u>11-17</u>
Related Task	<u>11-17</u>
Procedure	<u>11-17</u>
■ Statistics Menu	<u>11-18</u>
Procedure - Display ESF Statistics	<u>11-18</u>
ESF Statistics Field Descriptions	<u>11-19</u>
Display ESF Registers	<u>11-21</u>
ESF Registers Field Descriptions	<u>11-22</u>
■ Diagnostics Menu	<u>11-24</u>
View Diagnostics	<u>11-24</u>
Configure Loop Type	<u>11-25</u>
Configure NI BERT	<u>11-26</u>
Stop BERT	<u>11-26</u>
■ DS1 Diagnostic Loops	<u>11-27</u>
Diagnostics Menu Field Descriptions	<u>11-28</u>
■ Utilities Menu	<u>11-30</u>
Access Utilities	<u>11-30</u>
■ Set Board Status to Out of Service	<u>11-31</u>
■ Set Board Status to In Service	<u>11-32</u>
■ Reset Board	<u>11-33</u>
Purpose	<u>11-33</u>
Before You Begin	<u>11-33</u>
Procedure	<u>11-33</u>
■ Monitor System Manager Clock	<u>11-34</u>
Purpose	<u>11-34</u>
Procedure	<u>11-34</u>
Monitor Backplane Integrity Field Descriptions	<u>11-35</u>
■ Display Voice Control Signals	<u>11-36</u>
Voice Control Signal Field Descriptions	<u>11-37</u>
■ Dump Connection Statistics	<u>11-38</u>
Purpose	<u>11-38</u>
Procedure	<u>11-38</u>
■ View Trunk Conditioning	<u>11-40</u>

- Reload and Refresh Connection Map [11-41](#)
- About Menu [11-42](#)
 - Procedure - Display Identification Information [11-42](#)
- About Menu Field Descriptions [11-42](#)

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

Notes about the DS-1 Module

- A slot must be configured for the DS-1 module.
 - The DS-1 application module and rear interface must be physically present in the DACS II AX chassis.
 - For cabling and interface requirements, refer to Appendix B.
-

Configure Slot for Quad DS-1

Configure Slot Configure a slot for the Quad DS-1 module. Refer to [Configuring a Slot: page 4-8](#).

Configure DS-1 Ports

Description Before creating cross-connects to a Quad DS-1 module, specify values for the communications parameters used for each Quad DS-1 port.

Before You Begin Make sure that the slot has been configured for Quad DS-1.

Procedure - Configure Ports To configure the ports for a Quad DS-1 module:

1. From the *DACS II AX Main Menu*, you can do one of the following:
 - Select *Slot Configuration*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

The following menu appears:

Lucent Technologies . DACS II AX 11 - System Manager 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 11-2. 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.



NOTE:

Configuration parameters are determined by your local carrier.

3. Press **X** to save changes.

The following message appears:

Update configuration?Are you sure (Y/N)?

4. Press **Y(es)** to save your changes or press **N(o)** to cancel changes and return to previous menu.
-

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 11-2](#)):

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.

Quad DS-1 Main Menu

Access DS-1 Main Menu

To access the DS-1 Main Menu:

1. From the DACS II AX Main Menu, select *Node Summary*.
2. 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.

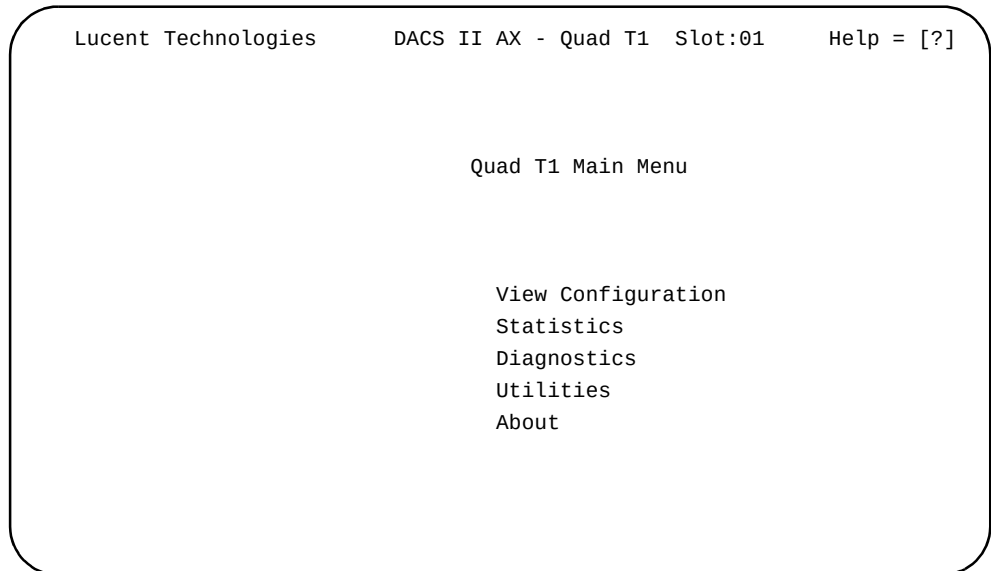


Figure 11-3. Quad DS-1 Main Menu

From the *Main Menu* you can display the module's port configuration, run diagnostic tests, access utilities, and display module identification (software and hardware revision levels).

View Configuration

Purpose The View Configuration option provides access to a display of the DS-1 port configuration.

Related Task To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**. For details, refer to [Configure DS-1 Ports: page 11-12](#).

Procedure To display the DS-1 module configuration:

1. From the DS-1 *Main Menu*, select *View Configuration*.
The Quad T-1 Port Configuration displays. The fields are described in [Configuration Menu Field Descriptions: page 11-14](#).
2. Press **X** to return to the previous menu.

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:

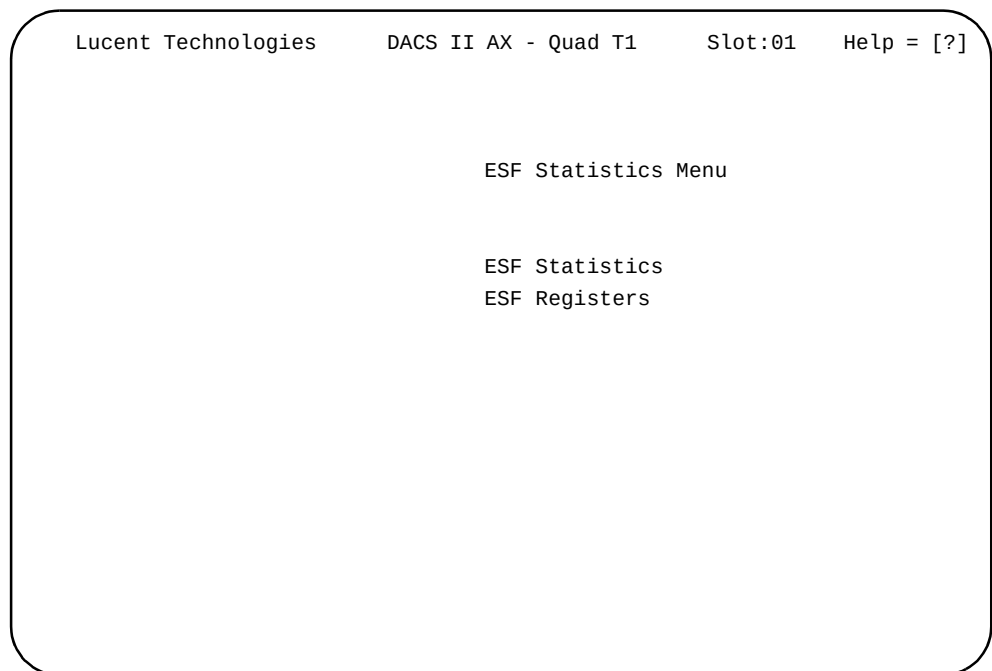


Figure 11-4. ESF Statistics Menu

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 11-5. 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 11-5](#)).

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:

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.

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:

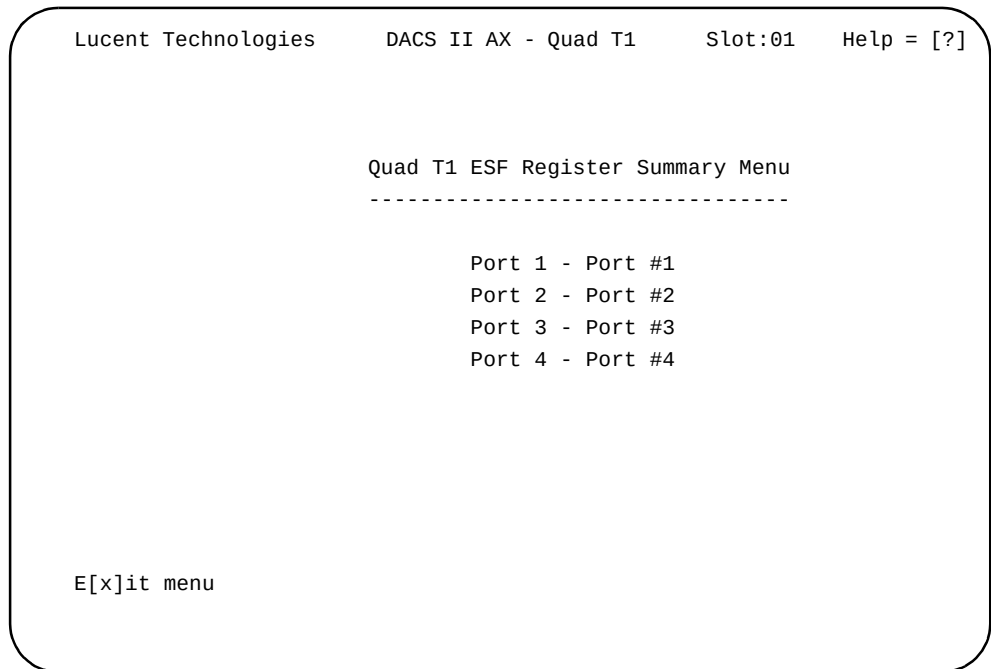


Figure 11-6. ESF Registers Summary Menu

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 11-7. 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 11-7](#)):

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.

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 11-8. 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**.

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 11-9. 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*.
-

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:

```
Lucent Technologies      DACS II AX - Quad T1  Slot:01  Help = [?]  
  
Quad T-1 Bert Manager  
  
Bert: Off
```

Figure 11-10. 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*.
-

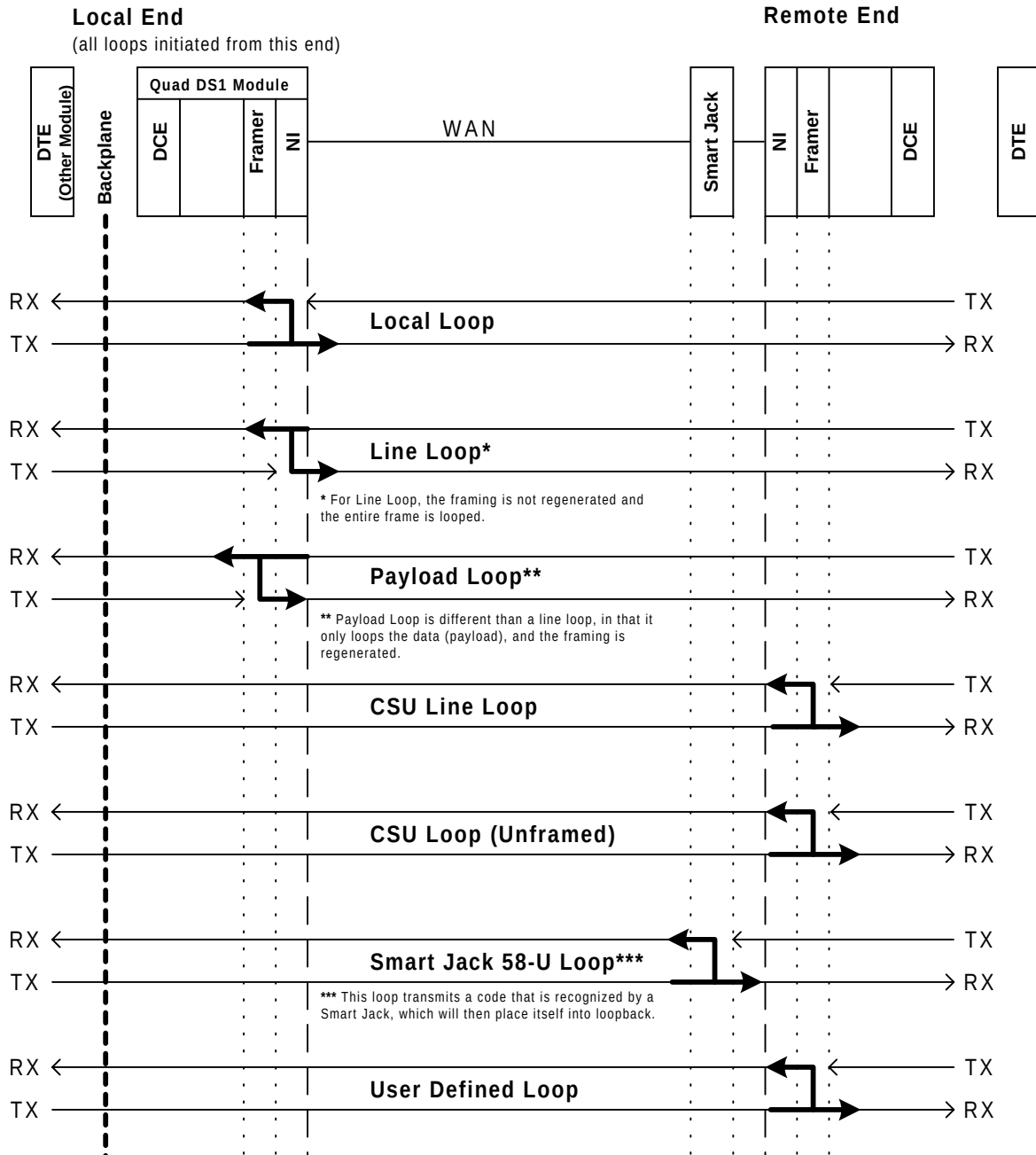
Stop BERT

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.

DS1 Diagnostic Loops

This diagram illustrates the available DS1 loops. The Local End is the DACS II AX.



Diagnostics Menu Field Descriptions

These fields appear on the Quad DS1 Diagnostics Manager Menu ([Figure 11-8](#)):

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 insync 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:

Only knowledgeable users should access Utilities, since they are service-affecting.

Access Utilities

To access the Utilities:

1. From the Quad DS-1 *Main Menu*, select *Utilities*. The following menu appears:

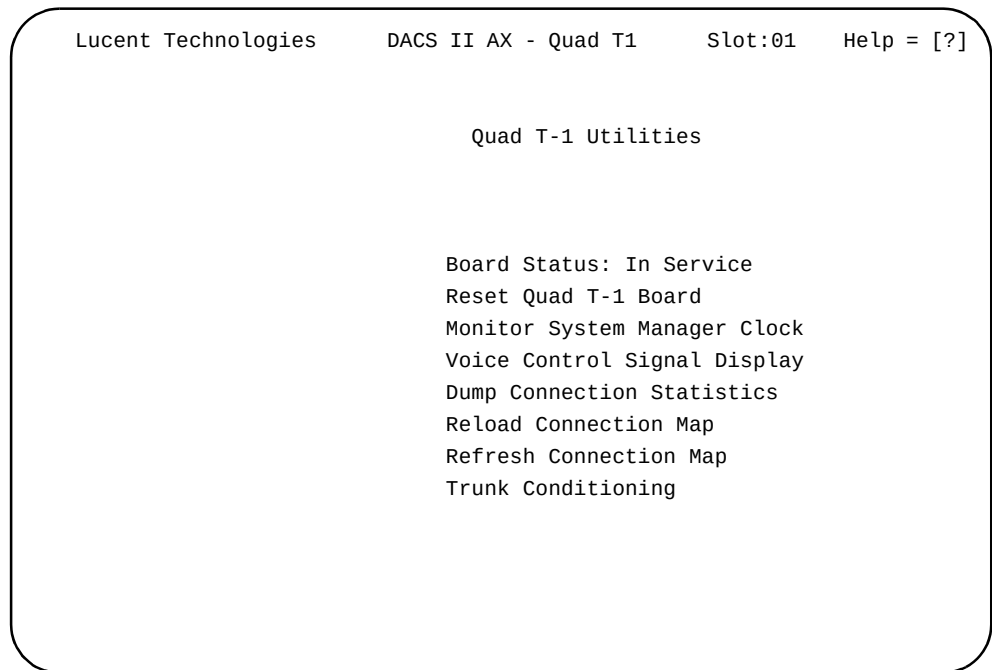


Figure 11-11. Utilities Menu

Set Board Status to Out of Service

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:

```
Lucent Technologies      DACS II AX - Quad T1  Slot:01  Help = [?]  
  
                          Quad T-1 Utilities  
  
*****  
*                               *  
*          -MESSAGE! -          *  
*                               *  
*                               *  
*   Force QT1 To Out Of Service?   *  
*                               *  
*                               *  
*   Are you sure (Y/N)?            *  
*                               *  
*****
```

Figure 11-12. 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.

Set Board Status to In Service

To change the board status to in service:

1. From the Quad DS-1 *Utilities Menu*, select *Board Status - Out of Service*.
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 11-13. 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.

Reset Board

- Purpose** 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.
- Before You Begin** **CAUTION:** Resetting the module will cause data to be momentarily corrupted.
- Procedure** To reset the board:
1. From the Quad DS-1 *Utilities Menu*, select *Reset Quad DS-1 Board* .
The following message appears: *Reset This Quad T-1 Board? Are you sure (Y/N)?*
 2. Do one of the following:
 - Press **N** to cancel reset.
 - Press **Y** to reset device. This message appears: *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.
-

Monitor System Manager Clock

Purpose 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.

Procedure To access the monitor system manager clock:

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 11-14. 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 11-14](#)).

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.

Display Voice Control Signals

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).

To access the Voice Control Signal Display:

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		From		To			
		Framer		Framer		Framer		Framer			
Write		-----			Read		Write		-----		
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 11-15. 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 11-15](#)).

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: Voice control signals. 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.

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.

Dump Connection Statistics

Purpose The *Dump Connection Statistics* is a view-only screen that displays the number of connections being used by the Quad DS-1 module.

Procedure To access the Dump Connection Statistics:

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 11-16. 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 11-16](#)).

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.

View Trunk Conditioning

To view 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:

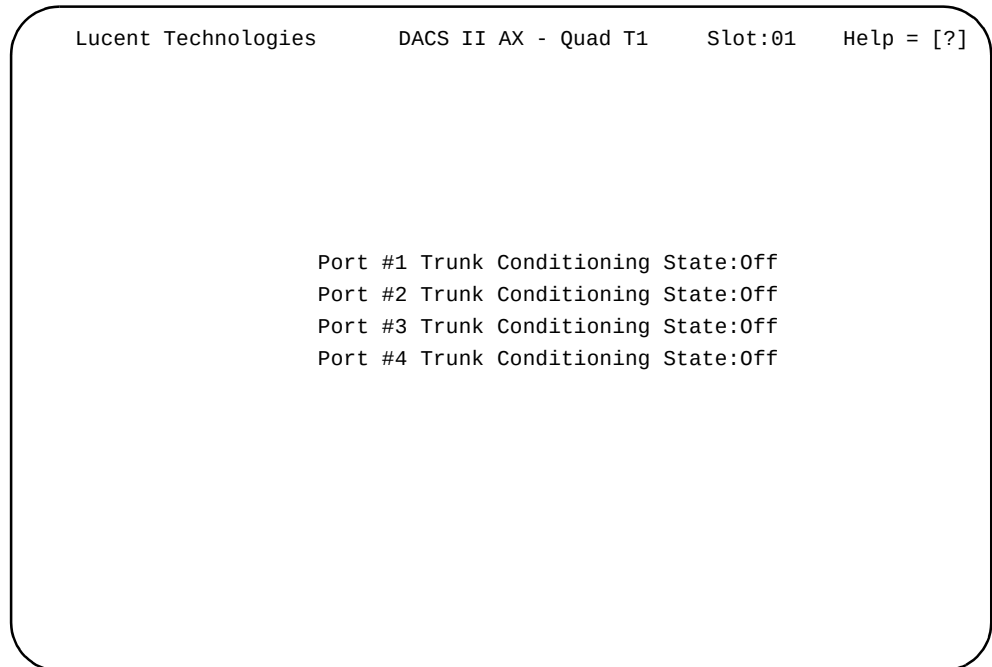


Figure 11-17. Trunk Conditioning

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.

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 11-18](#), 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.

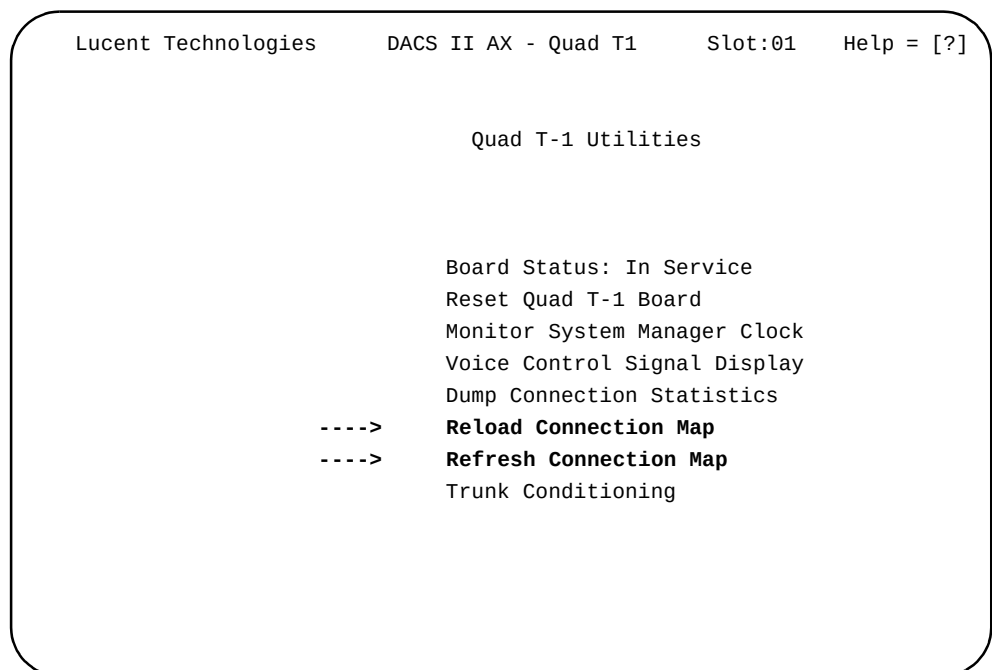


Figure 11-18. Reload and Refresh Connection Map Fields

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 for the Quad DS-1 module:

1. From the DS-1 *Main Menu*, select *About*. The following screen appears:

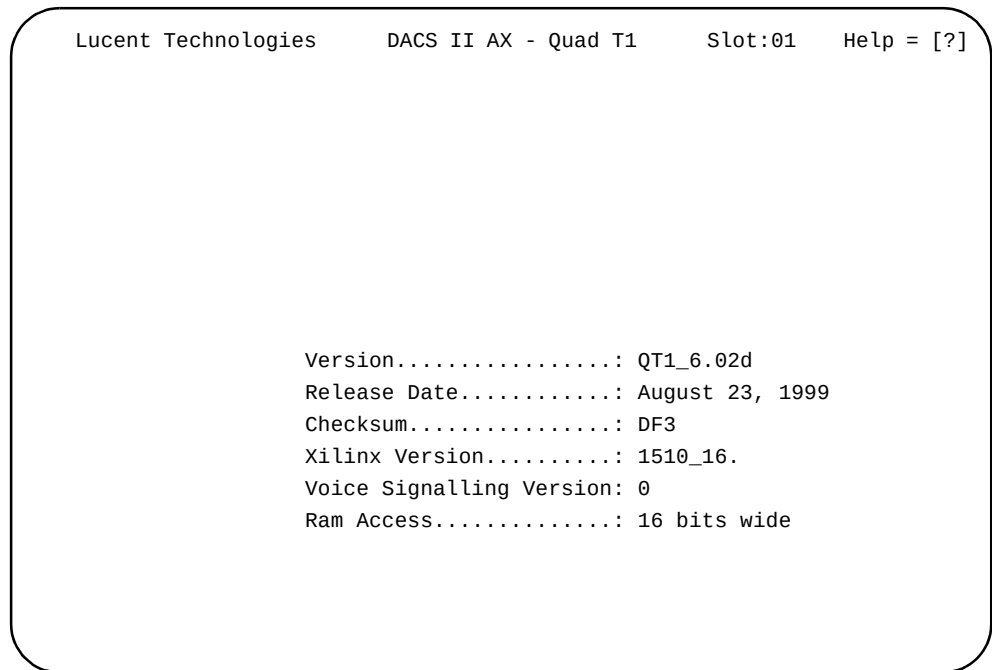


Figure 11-19. Quad DS-1 About Screen

2. Type **X** to return to the previous menu.
-

About Menu Field Descriptions

These fields appear on the Quad DS-1 About Screen ([Figure 11-19](#)).

Version: Displays the software version currently residing in the Quad DS1 Module's flash memory.

Release Date: Displays the date of software release.

Checksum: Displays the sum of all bytes in the Quad DS1 Module'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.

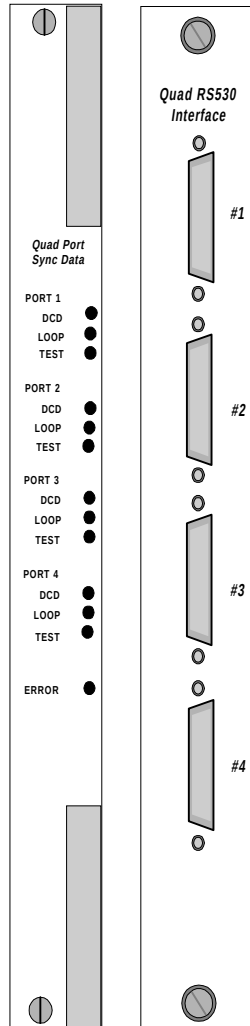
Ram Access: Displays the size of the memory bus.

Contents

■ Physical Description	<u>12-3</u>
■ Regulatory Information	<u>12-4</u>
FCC Information	<u>12-4</u>
FCC User Requirements	<u>12-5</u>
Industry Canada	<u>12-6</u>
■ Before You Begin	<u>12-7</u>
Notes about this Module	<u>12-7</u>
■ Configure Slot for Quad High Speed Module	<u>12-8</u>
Configure Slot	<u>12-8</u>
■ Configure QHS Ports	<u>12-9</u>
Before You Begin	<u>12-9</u>
Configure Ports	<u>12-9</u>
Cascade LEDs	<u>12-10</u>
Configuration Field Descriptions	<u>12-10</u>
■ Quad High Speed Main Menu	<u>12-14</u>
■ View Configuration	<u>12-15</u>
Purpose	<u>12-15</u>
Related Task	<u>12-15</u>
Procedure	<u>12-15</u>

■ Diagnostics Menu	<u>12-16</u>
Display Diagnostics	<u>12-16</u>
Local Loop	<u>12-17</u>
Remote Loop	<u>12-18</u>
Perform BERT Test	<u>12-19</u>
Stop BERT Test	<u>12-20</u>
■ Diagnostics Field Descriptions	<u>12-21</u>
■ Utilities Menu	<u>12-23</u>
Access Utilities	<u>12-23</u>
Set Board Status	<u>12-24</u>
Change Board Status In Service	<u>12-25</u>
Rest Quad High Speed Board	<u>12-26</u>
Monitor System Manager Clock	<u>12-27</u>
■ About Menu	<u>12-28</u>
Display Identification Information	<u>12-28</u>
About Field Descriptions	<u>12-29</u>

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

Notes about this Module

- A slot must be configured for the Quad High Speed module.
 - The Quad High Speed application module and rear interface must be physically present in the DACS II AX chassis.
 - For cabling and interface requirements, refer to Appendix B.
-

Configure Slot for Quad High Speed Module

Configure Slot Configure a slot for the Quad High Speed module. Refer to [Configuring a Slot: page 4-8](#).

Configure QHS Ports

Before You Begin Make sure that the slot has been configured for a Quad High Speed module.

Configure Ports To configure the ports on the Quad High Speed module:

1. From the *DACS II AX Main Menu*, you can do one of the following:
 - Select *Slot Configuration*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.**
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.**
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.**

The following menu appears:

Lucent Technologies
DACS II AX - System Manager
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 12-2. Quad High Speed Configuration Menu

2. To change the configuration for a port, move your cursor to the field to be configured and press **<Enter>** to toggle between the field's options. The fields are described in [Configuration Field Descriptions: page 12-10](#).
3. Press **X** to save changes.
The following message appears:
Update configuration? Are you sure (Y/N)?
4. Press **Y(es)** to save your changes or press **N(o)** to cancel changes and return to previous 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.

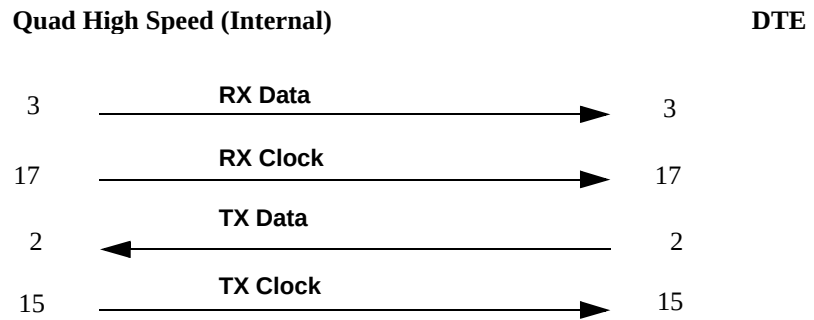
Speed: The Quad High Speed module operates at speeds from 48 Kbps to 2.048 Mbps (Nx56/64 Kbps).

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.

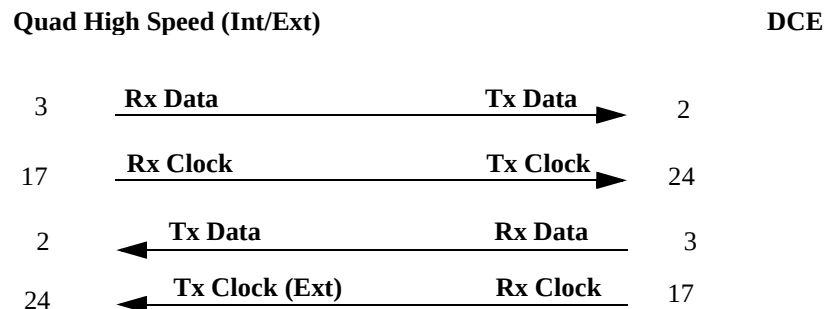
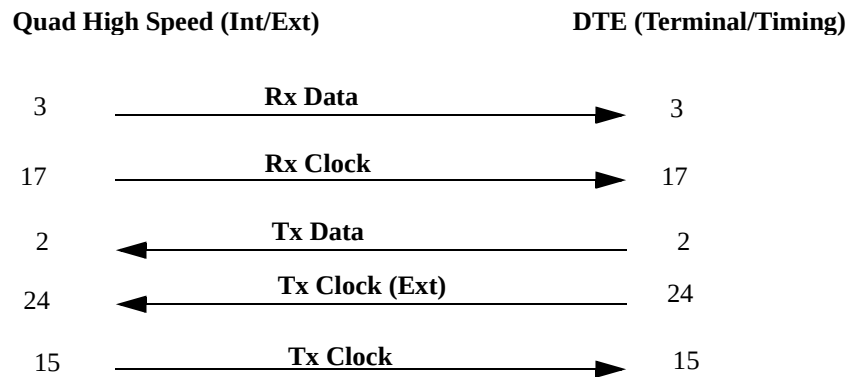


NOTE:

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.

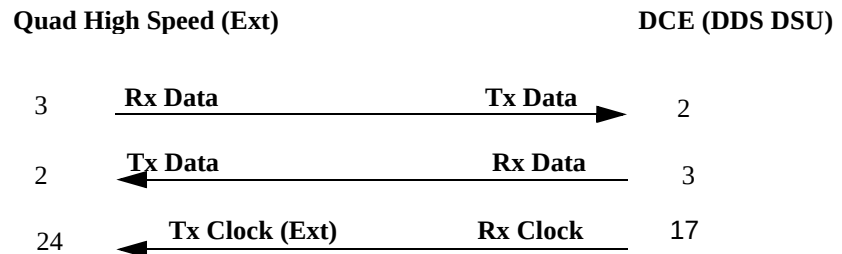


Int/Ext should be used if the attached equipment is DCE. The remote DCE must be loop timed to achieve the required timing lock with the DACS II AX system clock.

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.

Quad High Speed Main Menu

From the Quad High Speed *Main Menu*, you can display the module configuration, run diagnostic tests, access utilities, and display module identification.



Figure 12-3. Quad High Speed Main Menu

View Configuration

Purpose The View Configuration option provides access to a display of the Quad High Speed port configuration.

Related Task To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**. For details, refer to [Configure QHS Ports: page 12-9](#).

Procedure To display the module configuration:

1. From the *Main Menu*, select *View Configuration*.
The Quad High Speed Port Configuration displays. The fields are described in [Configuration Field Descriptions: page 12-10](#).
2. Press **X** to return to the previous menu.

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 12-4. 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:

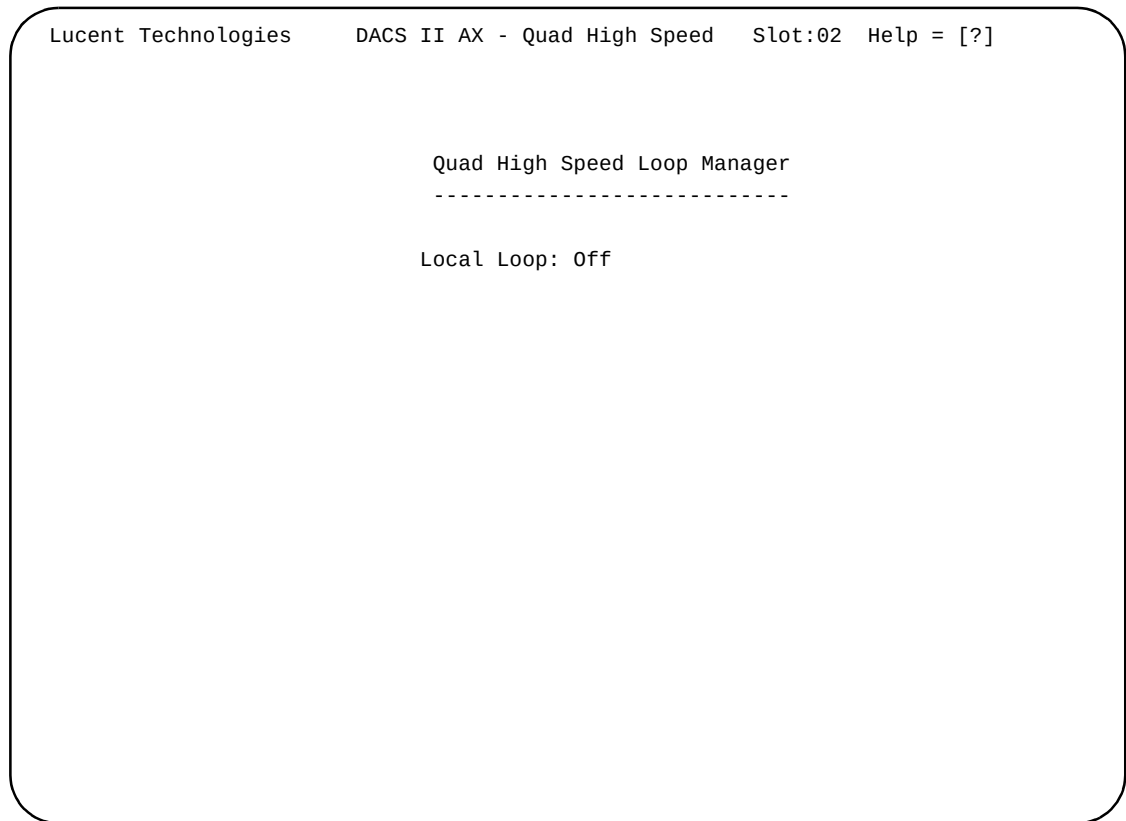


Figure 12-5. Quad High Speed Loop Manager

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:

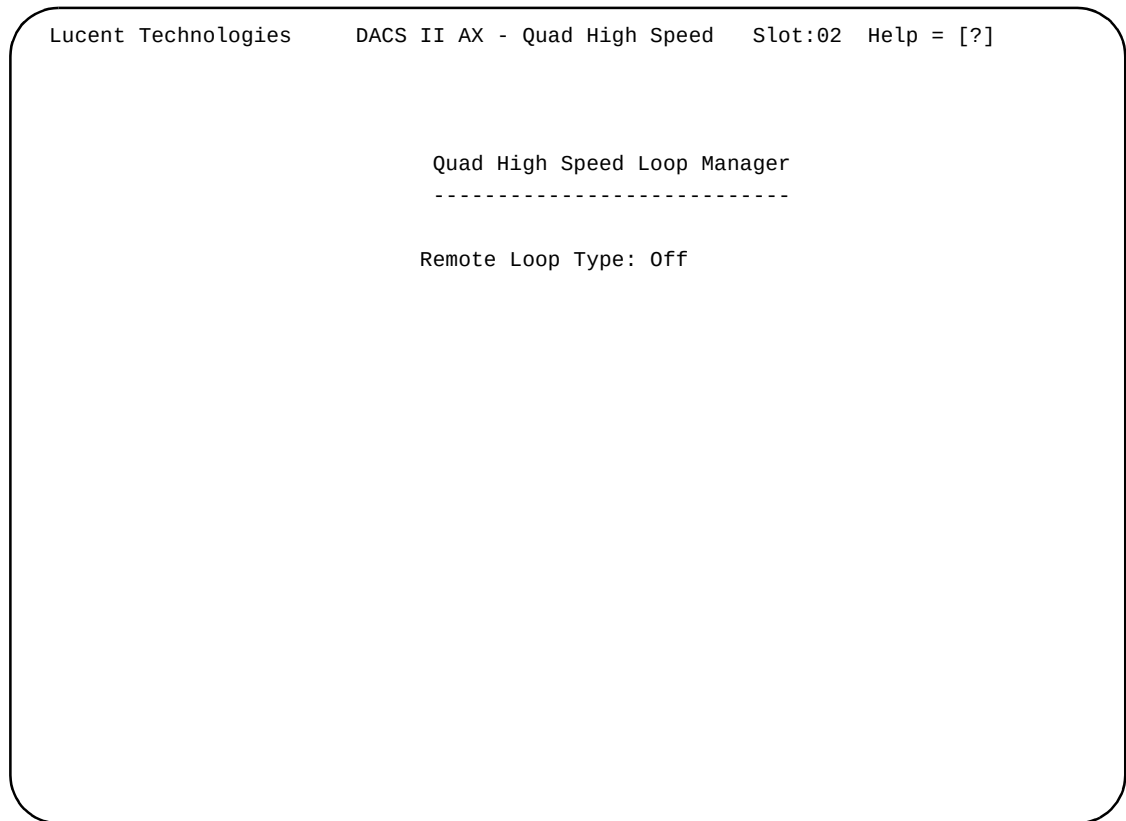


Figure 12-6. Quad High Speed Loop Manager

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:

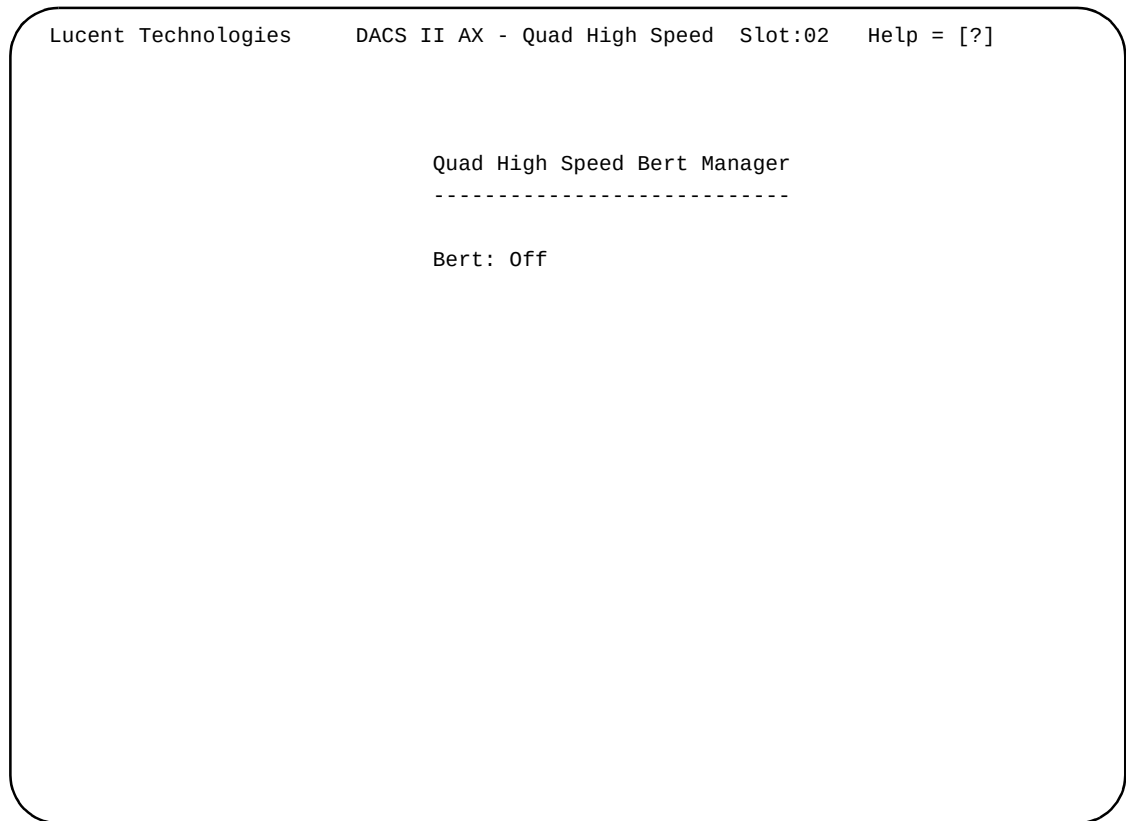


Figure 12-7. Quad High Speed Bert Manager

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

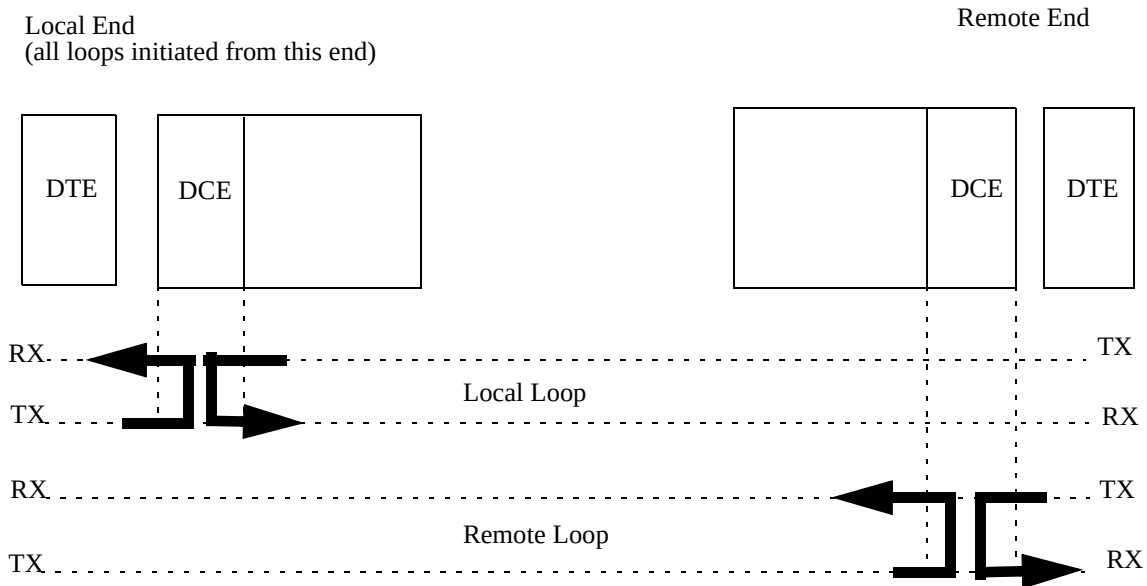
Name: This read-only field displays the name of each port on the Quad High Speed.

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 12-8. 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:

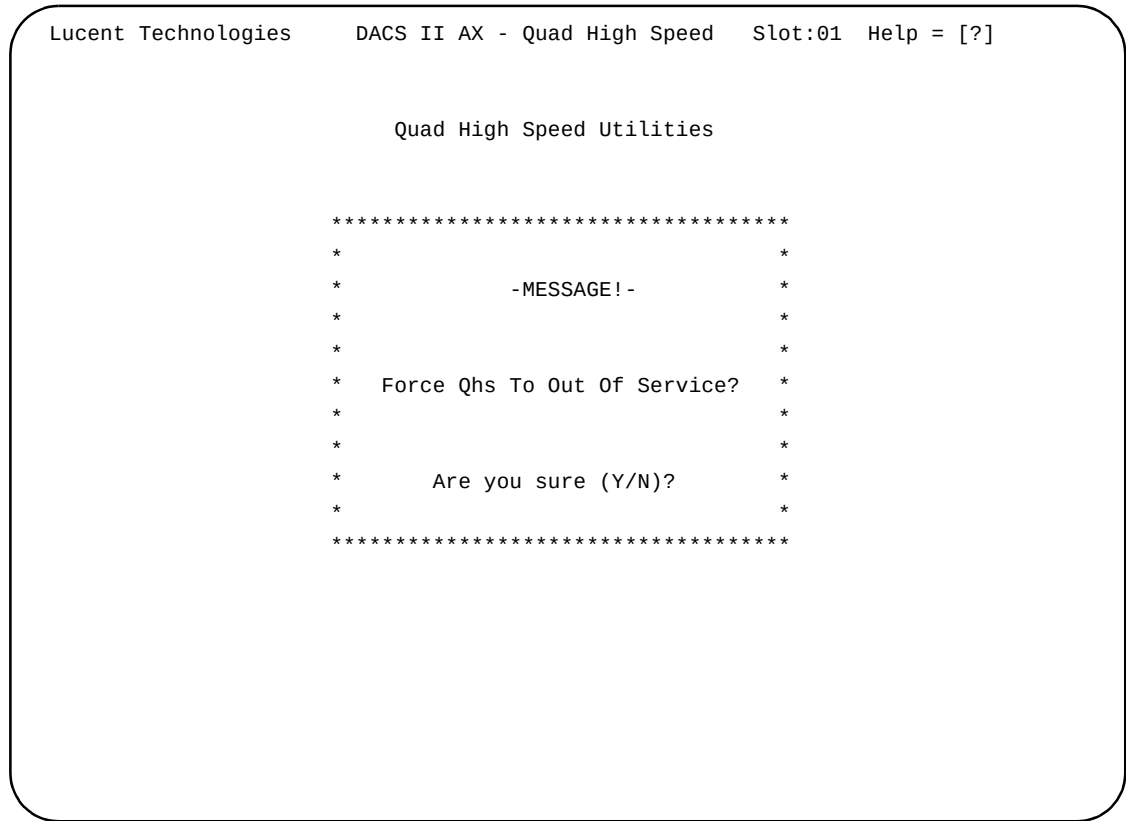


Figure 12-9. Out of Service Board Status Screen

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:

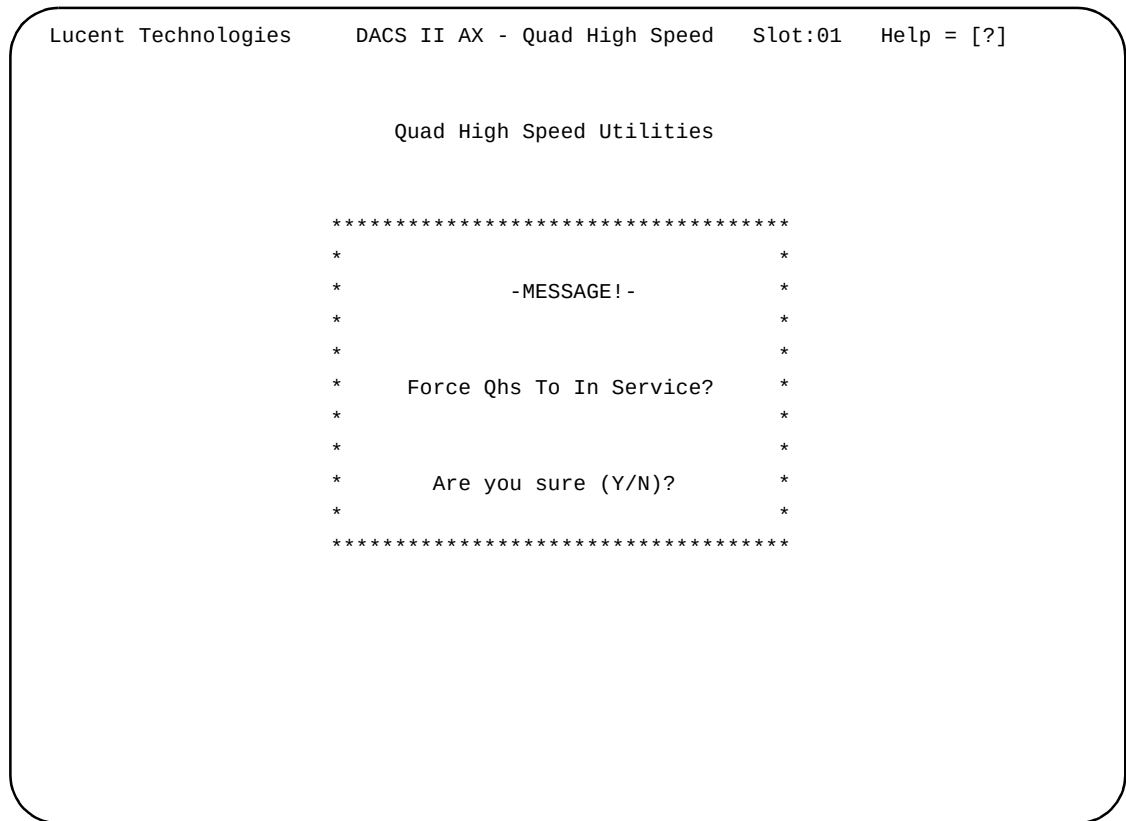


Figure 12-10. Change Board Status Screen

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:

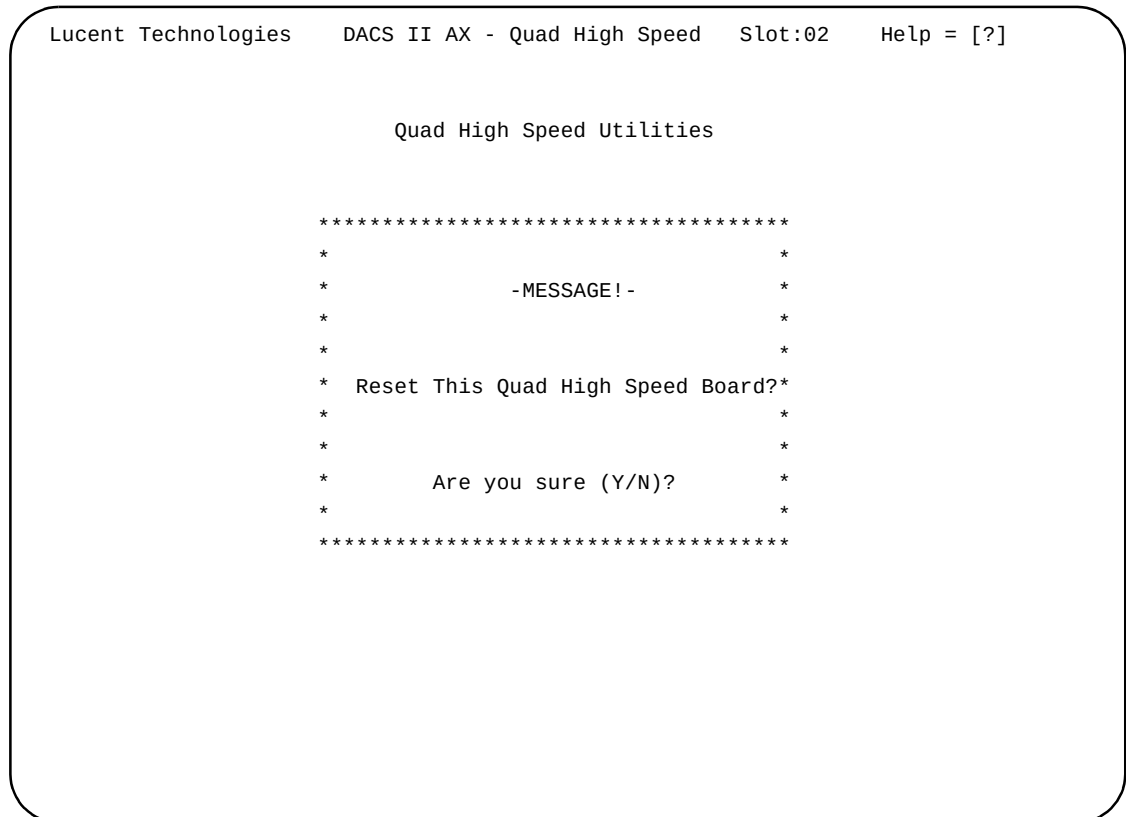


Figure 12-11. Reset Quad High Speed Board Screen

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 12-12. 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:

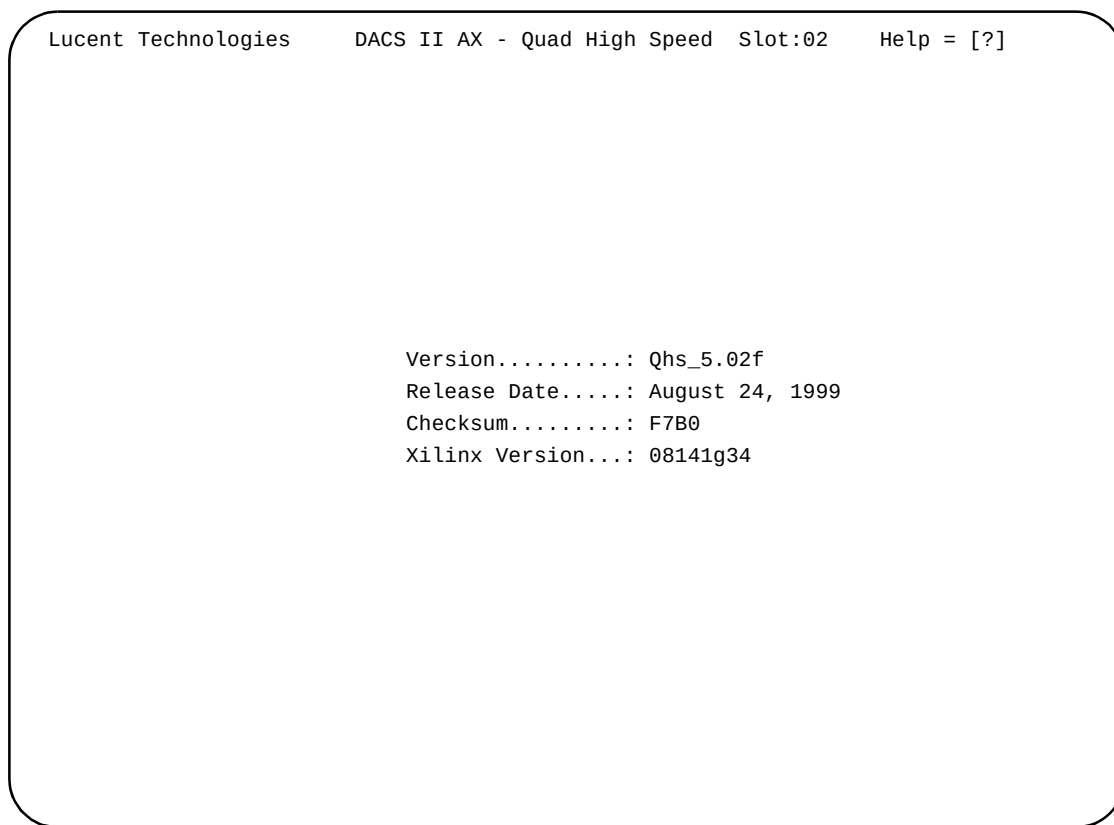


Figure 12-13. Quad High Speed About Screen

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.

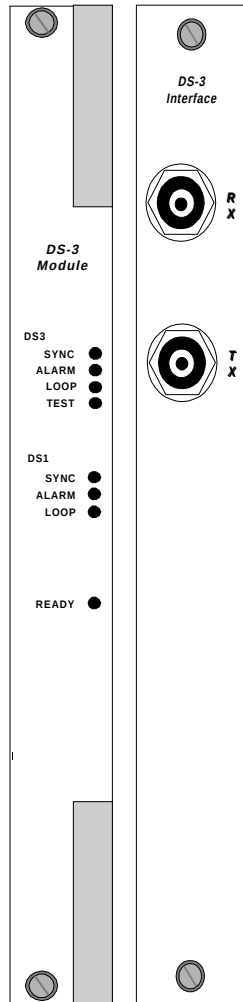
Contents

■ Physical Description	<u>13-5</u>
■ Regulatory Information	<u>13-6</u>
North America	<u>13-6</u>
Product Safety	<u>13-6</u>
Europe	<u>13-6</u>
■ Before You Begin	<u>13-7</u>
Notes about the DS-3 Module	<u>13-7</u>
■ Configure Slot for DS-3 Module	<u>13-8</u>
Configure Slot	<u>13-8</u>
■ DS-3 Port Configuration	<u>13-9</u>
Purpose	<u>13-9</u>
Before You Begin	<u>13-9</u>
Configure DS-3 Port	<u>13-9</u>
DS3 Port Configuration Field Descriptions	<u>13-11</u>
■ T1 Link Configuration	<u>13-13</u>
Configure T1 Links	<u>13-13</u>
T1 Configuration Manager Field Descriptions	<u>13-15</u>
■ Main Menu	<u>13-17</u>
Access DS-3 Main Menu	<u>13-17</u>

■ View Configuration	<u>13-18</u>
Purpose	<u>13-18</u>
Related Task	<u>13-18</u>
Procedure	<u>13-18</u>
■ Diagnostics Menu	<u>13-19</u>
Overview	<u>13-19</u>
Before You Begin	<u>13-19</u>
Access Diagnostics Menu	<u>13-19</u>
■ DS-3 Module Loops	<u>13-21</u>
Loop Types	<u>13-21</u>
■ Line Diagnostics	<u>13-22</u>
Perform Line Diagnostics	<u>13-22</u>
Clear Counters	<u>13-23</u>
Line Diagnostics Manager Field Descriptions:	<u>13-23</u>
Select T3/LIU Loop	<u>13-25</u>
Select T1 Loop	<u>13-26</u>
T1 Loop Select Field Descriptions	<u>13-27</u>
T1 BERT with 2047 Test Pattern	<u>13-27</u>
Display Frammer Status for T1 Channel	<u>13-28</u>
T1 Frammer Channel Status Field Descriptions	<u>13-29</u>
View ESF Statistics	<u>13-30</u>
ESF Statistics Field Descriptions	<u>13-31</u>
Display 15-min Performance Registers	<u>13-33</u>
15-min Performance Registers Field Descriptions	<u>13-34</u>
Display In-Service T1 links	<u>13-34</u>
■ DS3 Line Interface Unit Monitor Submenu	<u>13-35</u>
Display DS-3 Line Status	<u>13-35</u>
Line Interface Unit Monitor Field Descriptions	<u>13-36</u>
■ Utilities Menu	<u>13-37</u>
Access Utilities	<u>13-37</u>
Reset DS-3 Module	<u>13-38</u>
Set Board Status	<u>13-39</u>

■ N+1 Redundancy Menu	<u>13-42</u>
Display Redundancy Information	<u>13-42</u>
N+1 Redundancy Status Field Descriptions	<u>13-43</u>
■ About Menu	<u>13-45</u>
Display Identification Information	<u>13-45</u>
About Menu Field Descriptions	<u>13-46</u>

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

Notes about the DS-3 Module

- A slot must be configured for DS-3.
 - The DS-3 application module and rear interface must be physically present in the DACS II AX chassis.
 - For cabling and interface requirements, refer to Appendix B.
-

Configure Slot for DS-3 Module

Configure Slot Configure a slot for the DS-3 module. Refer to [Configuring a Slot: page 4-8](#).

DS-3 Port Configuration

Purpose

There are two parts to configuring a DS-3 module:

1. Configure the DS-3 port.
 2. Configure the T1/E1 links.
-

Before You Begin

Make sure the slot has been configured for the DS-3 module.

Configure DS-3 Port

To configure the DS-3 module:

1. From the *DACS II AX Main Menu* you can do one of the following:
 - Select *System Configuration*, then select *Slot Configuration*. Move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

The Module Configuration Menu displays ([Figure 13-2](#).)



NOTE:

You must use press **P** to configure the module. If you go through the module's Main Menu, you will access view-only configuration screens.

The **P** key will not work for slots 1 and 11 if they are set up for redundancy.

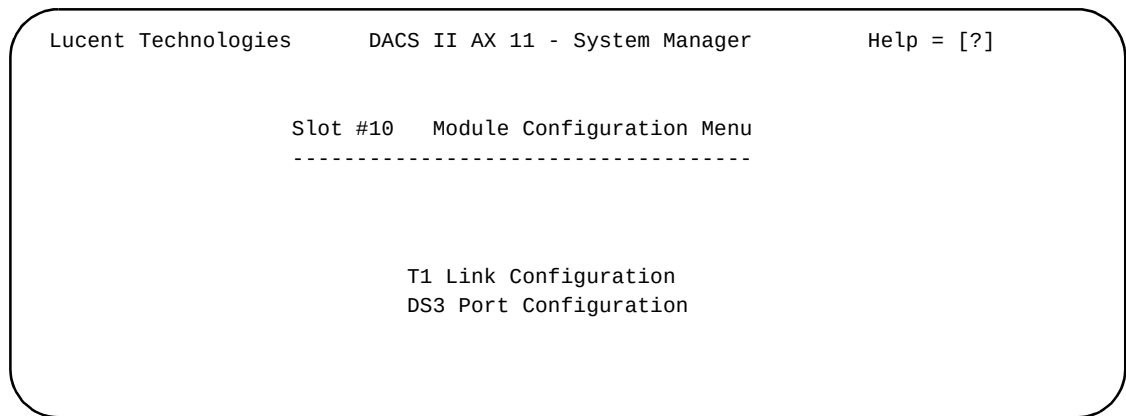


Figure 13-2. Module Configuration Menu

2. Select *DS3 Port Configuration*. The following submenu appears:

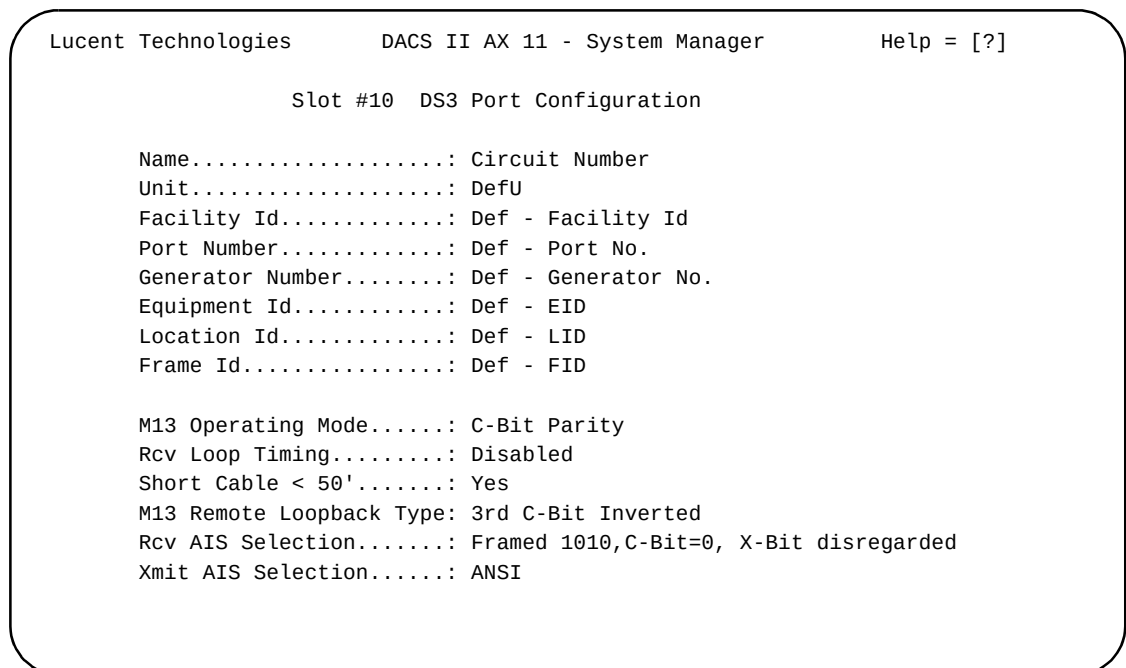


Figure 13-3. DS3 Port Configuration Submenu

Refer to [DS3 Port Configuration Field Descriptions: page 13-11](#).

3. Press **X** to save changes. When prompted: *Update Configuration? Are you sure (Y/N)?* Press **Y**.

DS3 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. This entry will appear in the *DS3* 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 DS3 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 DS3 to DS3 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 DS3 transmit timing. When *Enabled*, transmit timing is provided by a DS3 receive clock. When *Disabled*, DS3 transmit timing is provided by a free running on board oscillator.

Short Cable < 50': *(option field)* Controls the line build out of the DS3 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 DS3 remote line loopback requests. This setting is provided by the carrier. These codes cause a DS3 loopback in remote DS3 equipment or respond to codes from remote DS3 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 types are:

- 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 DS3 AIS may be detected in one of six ways. This setting is used to select the DS3 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 DS3 AIS may be generated in 1 of 4 ways. This setting is used to select the DS3 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

T1 Link Configuration

Configure T1 Links

To configure the T1 links:

1. From the *DACS II AX Main Menu*, select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.**

The Module Configuration Menu displays ([Figure 13-2.](#))

2. Select *T1 Link Configuration*. The T1 Configuration Manager Menu displays.

Lucent Technologies

DACS II AX - System Manager

Help = [?]

Slot #10 T1 Configuration Manager

Lnk	Name	Status	Frm	Density	NetLp	Yalarm	Format	ICode
01	Link 01	In Service	ESF	Clear	Yes	Yes	54016	Busy
02	Link 02	In Service	ESF	Clear	Yes	Yes	54016	Busy
03	Link 03	In Service	ESF	Clear	Yes	Yes	54016	Busy
04	Link 04	In Service	ESF	Clear	Yes	Yes	54016	Busy
05	Link 05	In Service	ESF	Clear	Yes	Yes	54016	Busy
06	Link 06	In Service	ESF	Clear	Yes	Yes	54016	Busy
07	Link 07	In Service	ESF	Clear	Yes	Yes	54016	Busy
08	Link 08	In Service	ESF	Clear	Yes	Yes	54016	Busy
09	Link 09	In Service	ESF	Clear	Yes	Yes	54016	Busy
10	Link 10	In Service	ESF	Clear	Yes	Yes	54016	Busy
11	Link 11	In Service	ESF	Clear	Yes	Yes	54016	Busy
12	Link 12	In Service	ESF	Clear	Yes	Yes	54016	Busy
13	Link 13	In Service	ESF	Clear	Yes	Yes	54016	Busy
14	Link 14	In Service	ESF	Clear	Yes	Yes	54016	Busy

[N]ext page

3. From this screen, you can:
 - Change parameters for an individual link, move the cursor to the link to be changed and press **<Enter>**.
 - Copy an existing configuration for a link to all other links, move the cursor to the row to be copied and press **C**.
 - Display the next page of T1 links. Press **N** to display links 15-28.
4. If you display an individual link, the T1 Link Configuration Menu displays. Modify the entries. Refer to [T1 Configuration Manager Field Descriptions: page 13-15](#).

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

Slot #10 T1 Link Configuration

Link #.....: 10
Name.....: Link 10
Framing.....: ESF
Status.....: In Service
Recover Time.: 3 seconds
Density.....: Clear
Network Loops: Yes
Yellow Alarm.: Yes
ESF Format...: 54016
Unused DSO's.: Busy

5. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.
-

T1 Configuration Manager Field Descriptions

Link #: Select any of the 28 links 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 link on the DS3 module. You may find it beneficial to use circuit numbers to name the links.

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 DS3 module's ability to respond to diagnostic commands received from the network supplier. Select *Yes* unless the commands are to be passed to another DS3 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 DS3 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).

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).

Main Menu

The DS-3 Main Menu is accessed from the Node Summary Menu. From the Main Menu you can display the module configuration, 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 DS-3 Main Menu

To access the Main Menu:

1. From the DACS II AX *Main Menu*, select *Node Summary*.
2. Place the cursor on the slot number where the DS-3 is located and press **<Enter>**. The DS-3 *Main Menu* displays.



NOTE:

On the Node Summary Menu, the Configured Type must display "DS-3" and the Device State must display "Online" or "Standby" in order to access the DS-3 Module Main Menu. If the Device State is "Off-line", an alert message is generated.

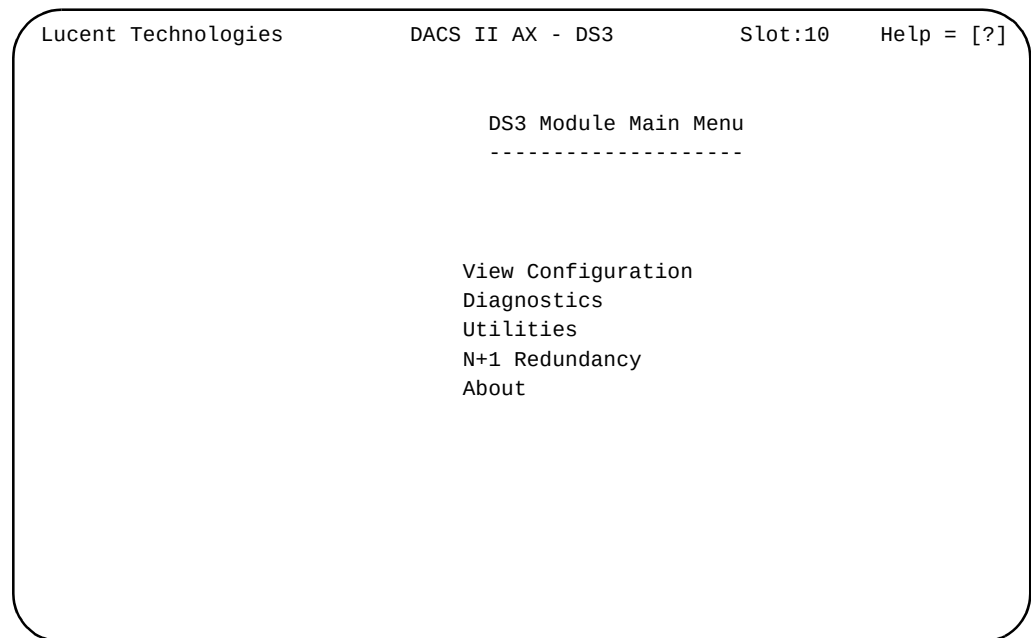


Figure 13-4. DS3 Module Main Menu

View Configuration

Purpose The View Configuration option provides access to submenus from which the DS-3 Port and T1 link configurations can be displayed.

Related Task To change the link configuration, refer to [DS-3 Port Configuration: page 13-9](#).

Procedure To display the DS-3 module configuration:

1. From the DS-3 *Main Menu*, select *View Configuration*.
2. Select an option.
 - Select *DS3 Port Configuration* to display the DS-3 port settings. Fields are described in [DS3 Port Configuration Field Descriptions: page 13-11](#).
 - Select *T1 Link Configuration* to display the T1links. Press **N** to view more links. Move the cursor to a link and press **<Enter>** to display status information for that link. The fields are described in [T1 Configuration Manager Field Descriptions: page 13-15](#).
3. Press **X** to return to the Configuration Menu.

Diagnostics Menu

Overview The Diagnostics Menu provides access to several diagnostics, 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 13-6](#).

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.

Before You Begin A module must be In Service to access the Diagnostics Menu. For further information, see [Set Board Status: page 13-39](#).

Access Diagnostics Menu 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:

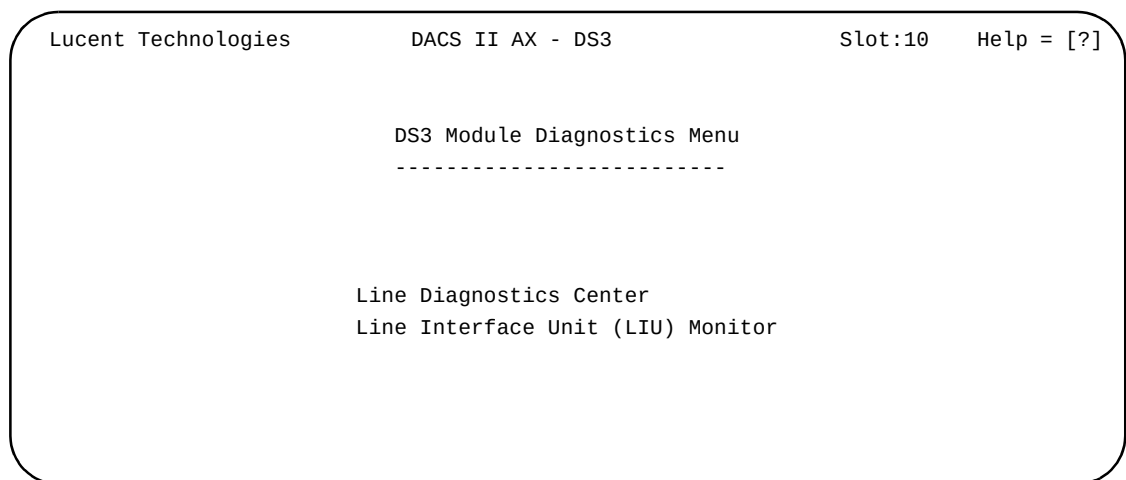


Figure 13-5. DS3 Module Diagnostics Menu

The Diagnostics Menu has two options ([Figure 13-5](#)).

- **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 *DS3 Line Interface Unit Monitor* display. This display is a read-only screen, allowing you to view the status of loopbacks and errors.
-

DS-3 Module Loops

Loop Types [Figure 13-6](#) shows the loops that the DS-3 module supports.

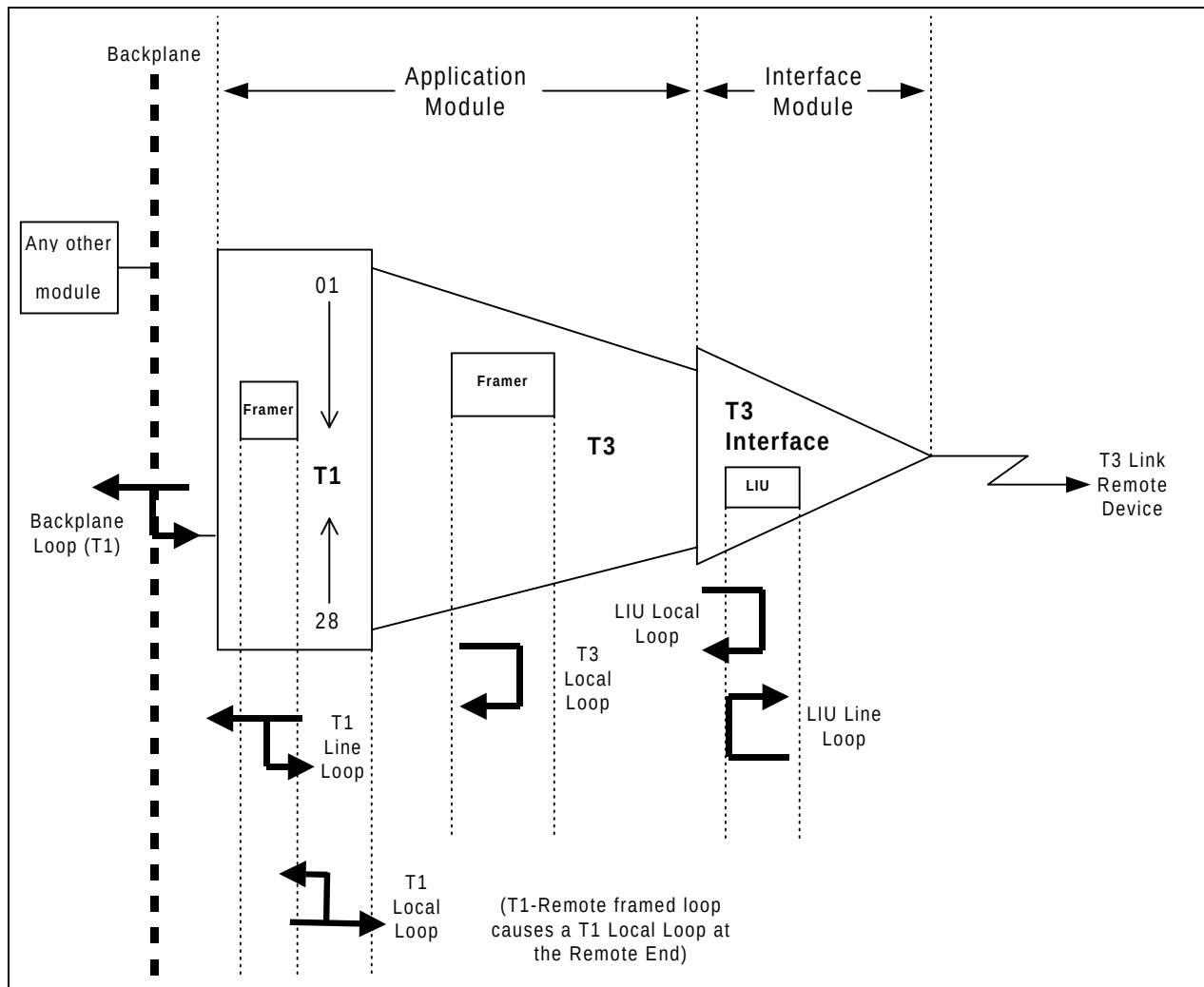


Figure 13-6. DS-3 Module Loops

Line Diagnostics

The Line Diagnostics Center is used to set up line diagnostics for the DS-3 Module.

Perform Line Diagnostics

To perform Line Diagnostics:

1. From the *Diagnostics Menu*, select *Line Diagnostics Center*. The following submenu appears:

Lucent Technologies
DACS II AX - DS3
Slot:10
Help = [?]

Diagnostics Manager

T1	Name	Loop	Back Plane	Status	Red	Yel	Crc	Err Sec
1	Link 01	Off	Off	OK	0	0	0	0
2	Link 02	Off	Off	OK	0	0	0	0
3	Link 03	Off	Off	OK	0	0	0	0
4	Link 04	Off	Off	OK	0	0	0	0
5	Link 05	Off	Off	OK	0	0	0	0
6	Link 06	Off	Off	OK	0	0	0	0
7	Link 07	Off	Off	OK	0	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)
15-min Performance [R]egisters
[C]lear counters
[N]ext
[I]n service (toggle view)

Figure 13-7. Diagnostics Manager Submenu

The *Diagnostics Manager* displays the status for all of the T1links in the DS-3. The first seven links are displayed, to view an additional 7 links (up to 28 total), press **N**.

Clear Counters

To clear counters for the DS3 framer and all 28 links (including those not shown on the current screen), press **C**. To clear counters for just the DS3 framer or a single link, put the cursor on the link, press **E** to expose the link, then press **C**.

Line Diagnostics Manager Field Descriptions:

T1 Channel Fields

T1: Displays the T1 link number.

Name: Displays the name assigned to the T1 link.

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 current status of the T1 link 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

DS3: Displays the DS-3 port name that has been configured via the *DS3 Port Configuration* submenu.

Loop: Displays the type of diagnostic loop that has been enabled. *DS3-Local* or *LIU-Loop* will be indicated, or *Off* is displayed if no loop has been enabled.

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 *DS3 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*, select *Line Diagnostics Center*.

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 - DS3      Slot:10  Help = [?]  
  
T3/LIU Loop Select Screen  
-----  
  
Loop Type: DS3-Local
```

Figure 13-8. T3/LIU Loop Select Submenu

2. The *DS3/LIU Loop Select* submenu is used to select DS3/LIU Loops for diagnostic purposes. The following can be selected by pressing **<Enter>** to cycle through the choices:
 - **Off** - No loop will be enabled.
 - **DS3-Local** - A T3 Local Loop will be enabled.
 - **LIU-Loop** - An LIU Loop will be enabled.
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 link (#1 - 28), and press **<Enter>**. The following submenu appears:

```
Lucent Technologies      DACS II AX - DS3      Slot:10      Help = [?]  
  
Link: 1  
T1 Loop Select Screen  
-----  
  
Loop Type.....: Off  
Backplane Loop: Off
```

Figure 13-9. 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 13-9](#)).

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 link (#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 link 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 link 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 Framers Status for T1 Channel

To view Framer Status for a T1 link:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable T1 link (#1 - 28) and press **E**. The following display appears:

```

Lucent Technologies          DACS II AX - DS3          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 13-10. 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 interrupted.

**T1 Framer Channel
Status Field
Descriptions**

These fields appear on the T1 Framer Channel Status menu ([Figure 13-10](#)).

Framer #: Displays the framer number for the selected link.

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 link (#1 - 28), and press **S**. The *ESF Statistics* display for the selected T1 link appears.



NOTE:

The selected T1 link must be configured as ESF, otherwise an error message will appear.

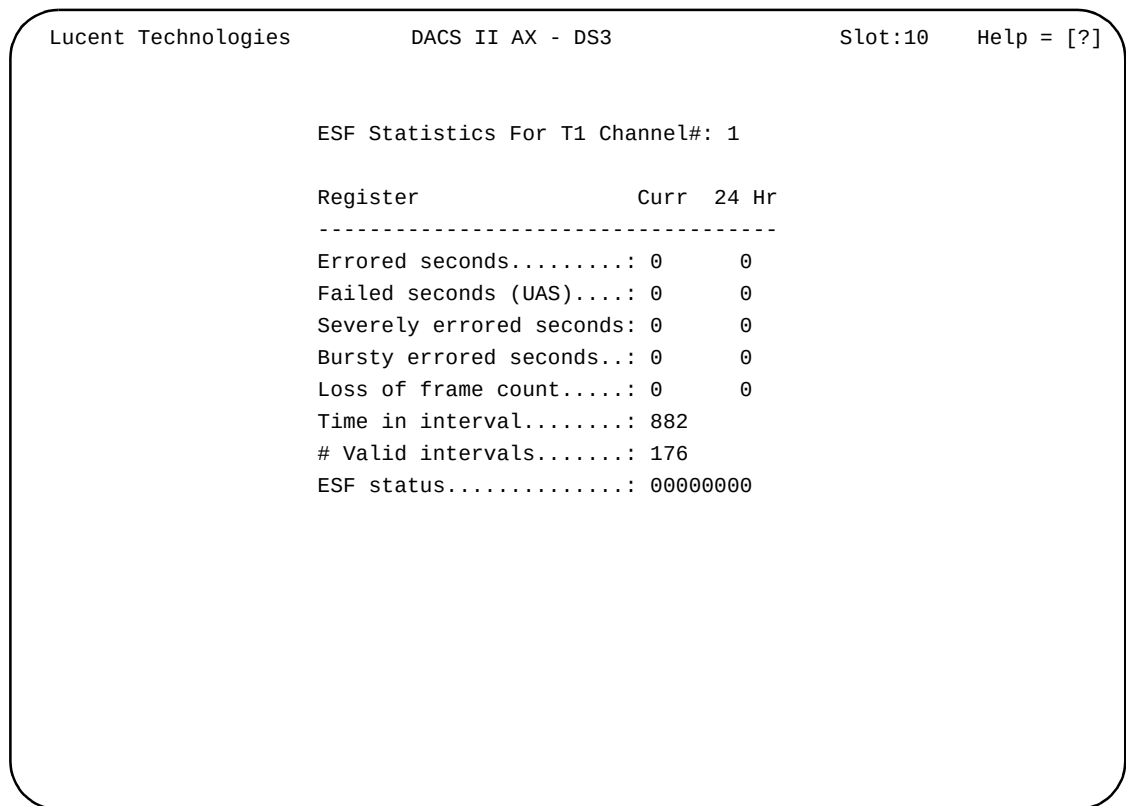


Figure 13-11. ESF Statistics Display

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 13-11](#)).

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 and 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 15-min Performance Registers

To view 15-min Performance Registers:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable T1 link (#1 - 28) and press **R**. The *15-min Performance Registers* display for the selected T1 link appears.

The selected T1 link must be configured as ESF, otherwise an error message will appear.

Lucent Technologies

DACS II AX - DS3

Slot:10

Help = [?]

15-min Performance 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 13-12. 15-min Performance Registers Display

2. The *15-min Performance Registers* display is a read-only screen. Press **N** to view the next 48 intervals.

**15-min
Performance
Registers Field
Descriptions**

These fields appear on the 15-min Performance Registers display ([Figure 13-12](#)).

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 links**

To view the T1 links currently in service:

From the *Diagnostics Manager* submenu, press **I**. The display will refresh, and only those T1 links which are currently in service will appear. Press the **I** key again, and all 28 links are displayed.

DS3 Line Interface Unit Monitor Submenu

The DS3 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 - DS3 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 13-13. Line Interface Unit Monitor Display

2. The *DS3 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 13-13](#)).

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 DS3 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:

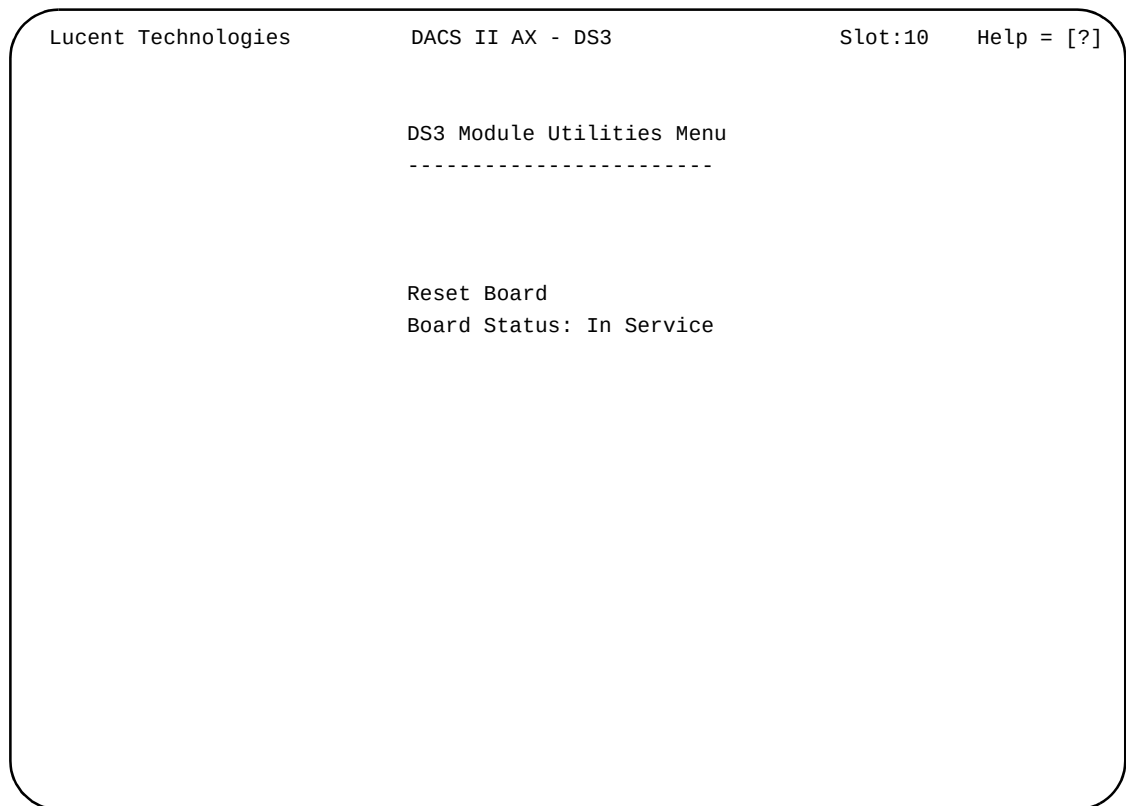


Figure 13-14. Utilities Menu

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 interrupted.

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:

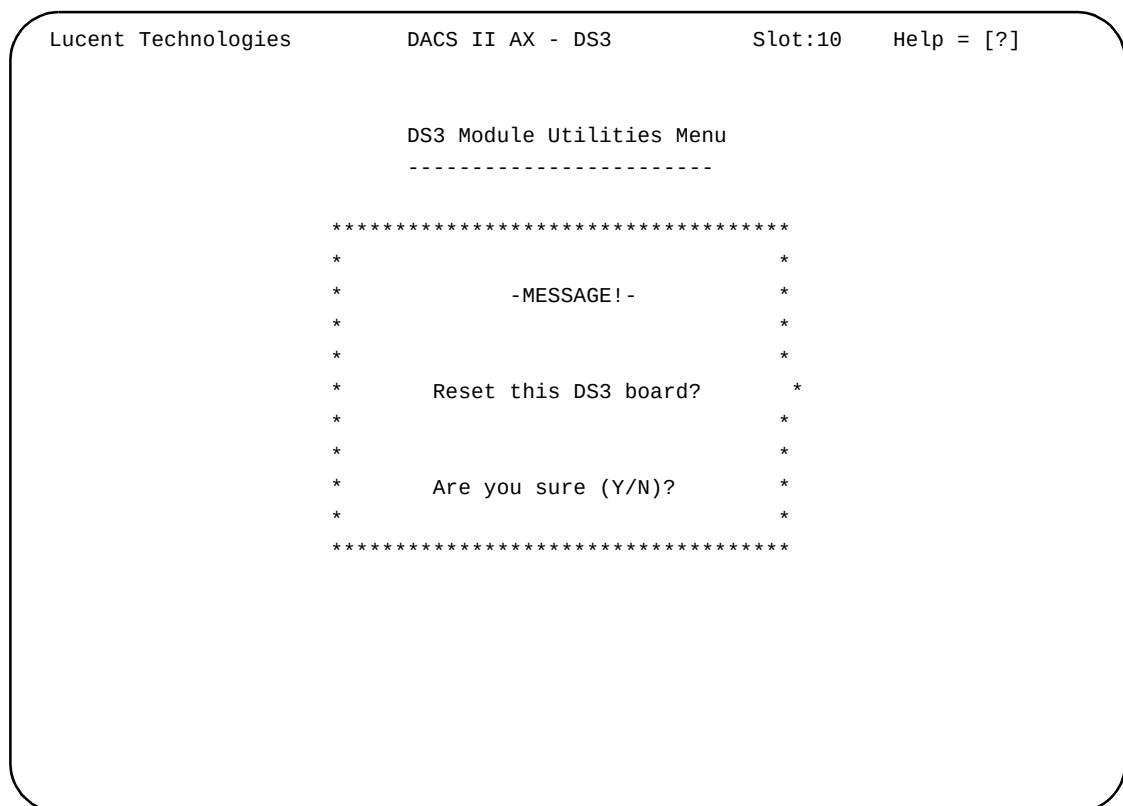


Figure 13-15. Reset Board Screen

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:

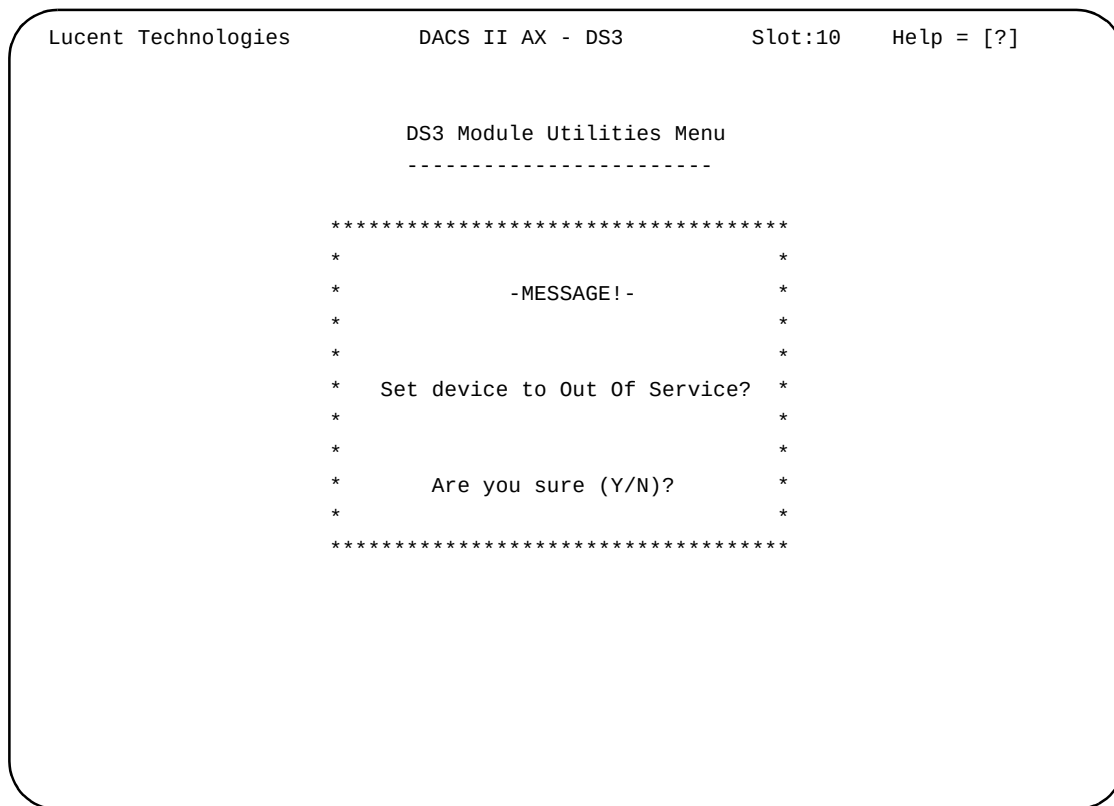


Figure 13-16. Board Status Screen

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 13-17. 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 *DS3 Main Menu*, move your cursor to the *N+1 Redundancy* field and press **<Enter>**. The following menu appears:

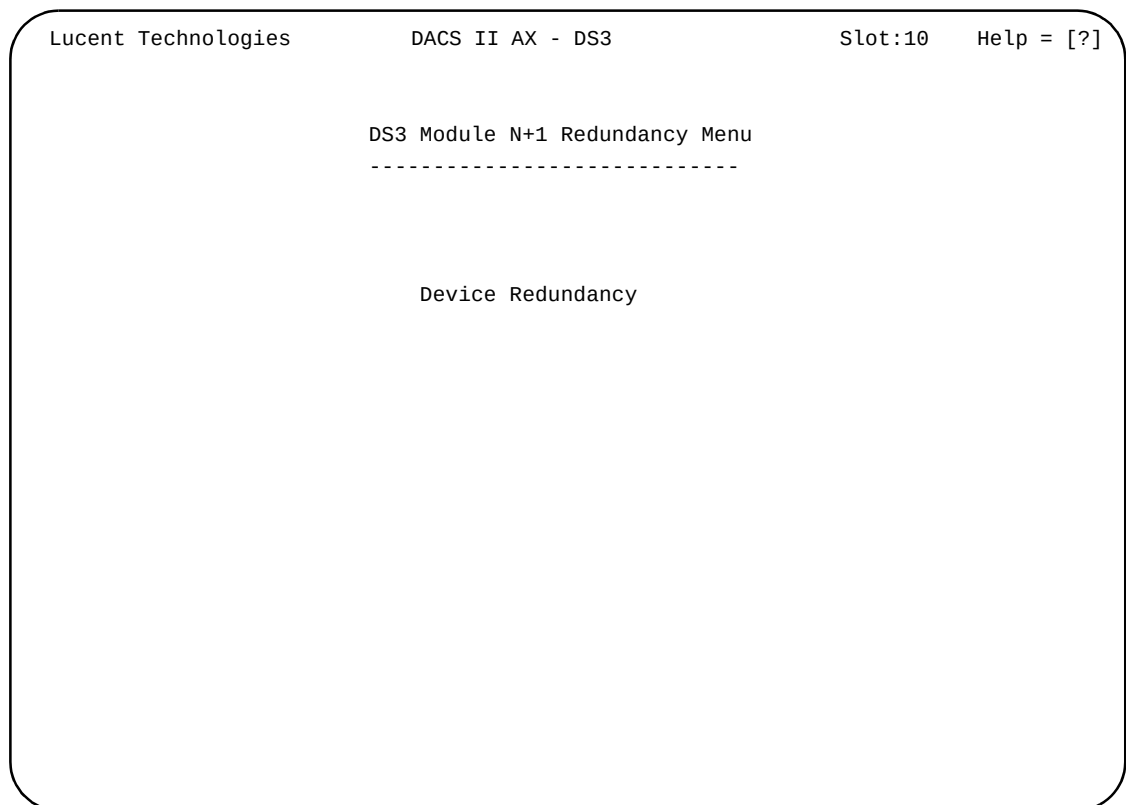


Figure 13-18. DS3 Module N+1 Redundancy Menu

2. Then place your cursor on the *Device Redundancy* field and press **<Enter>**. The following display appears:

Lucent Technologies
DACS II AX - DS3
Slot:10
Help = [?]

N+1 Redundancy Status Menu

Member of Redundancy Group: Yes
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 13-19. 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 13-19](#)).

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:

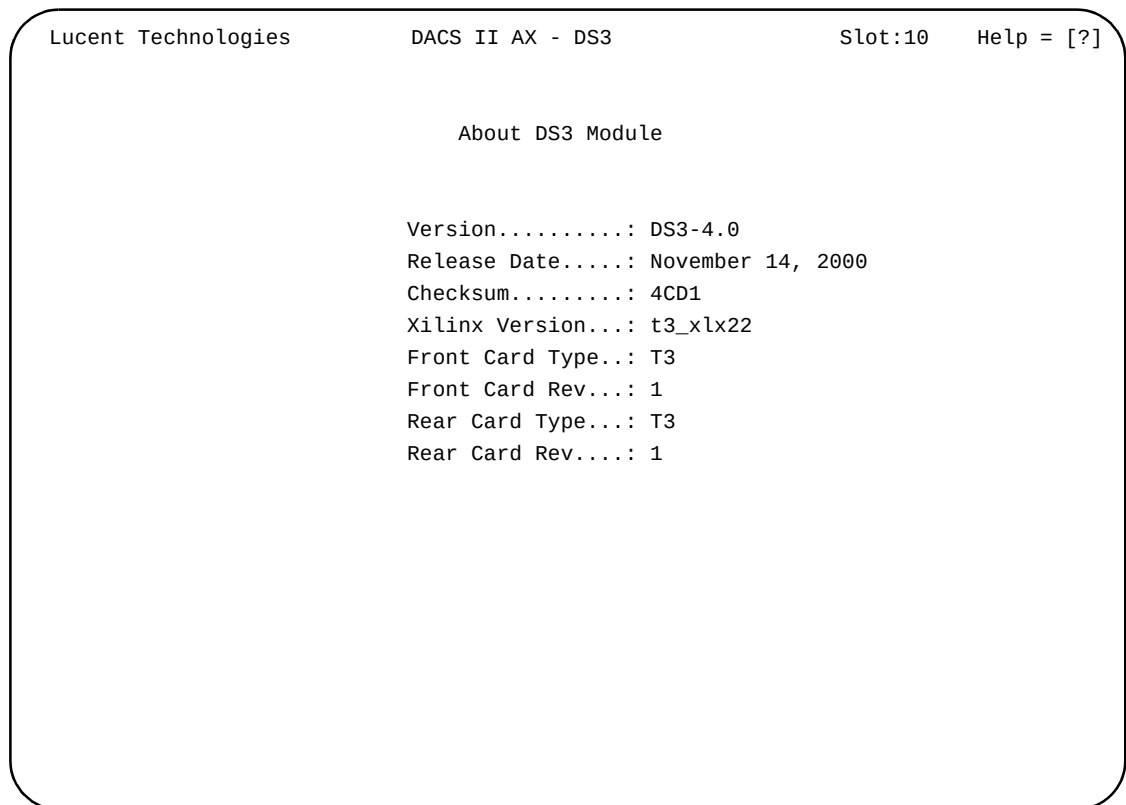


Figure 13-20. About DS3 Module Display

2. The *About DS3 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 DS3 Module menu ([Figure 13-20](#)).

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.

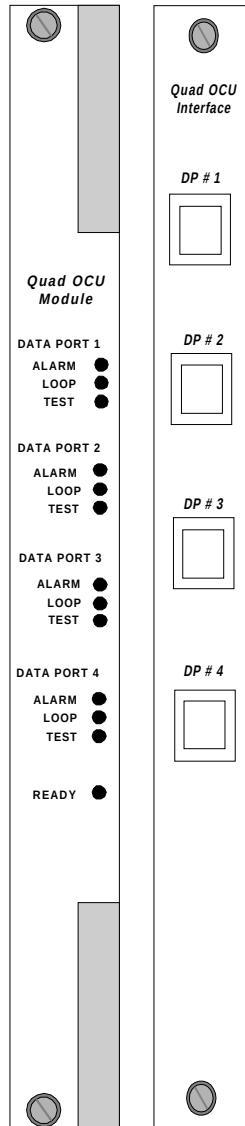
Rear Card Rev: Displays the Interface Module's hardware revision level.

Contents

■ Physical Description	14-3
DDS Loops	14-5
■ Regulatory Information	14-6
North America	14-6
Product Safety	14-6
Europe	14-6
■ Before You Begin	14-7
Notes about the Quad OCU Module	14-7
■ Configure Slot for Quad OCU Module	14-8
Configure Slot	14-8
■ Configure Quad OCU Ports	14-9
Before You Begin	14-9
Procedure	14-9
Configuration Menu Field Descriptions	14-11
■ Quad OCU Main Menu	14-12
Access Main Menu	14-12
■ View Configuration	14-13
Purpose	14-13
Related Task	14-13

Procedure	<u>14-13</u>
■ Diagnostics Menu	<u>14-14</u>
View Diagnostics and Configure Loop Type	<u>14-14</u>
Configure BERT	<u>14-16</u>
Diagnostics Monitor Field Descriptions	<u>14-16</u>
■ Utilities Menu	<u>14-20</u>
Access Utilities	<u>14-20</u>
Set Board Status to In Service	<u>14-21</u>
Change Board Status to In Service	<u>14-22</u>
View System Clocks	<u>14-23</u>
View Backplane Integrity	<u>14-24</u>
Monitor Backplane Integrity Field Descriptions	<u>14-24</u>
Reset Device	<u>14-26</u>
■ About Menu	<u>14-28</u>
Display Identification Information	<u>14-28</u>
About Menu Field Descriptions	<u>14-29</u>

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.

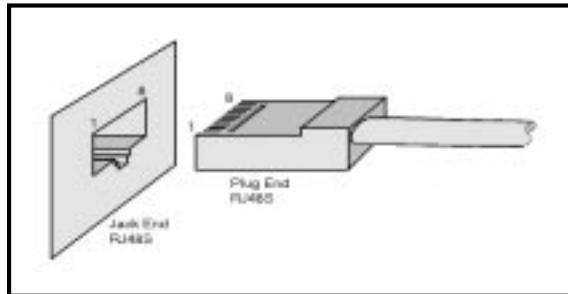


Figure 14-2. RJ48S Jack and Plug End

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

Notes about the Quad OCU Module

- A slot must be configured for Quad OCU.
 - The Quad OCU application module and rear interface must be physically present in the DACS II AX chassis.
 - For cabling and interface requirements, refer to Appendix B.
-

Configure Slot for Quad OCU Module

Configure Slot Configure a slot for the Quad OCU module. Refer to [Configuring a Slot: page 4-8](#).

Configure Quad OCU Ports

Before You Begin Make sure the slot has been configured for the Quad OCU module.

Procedure To configure the Quad OCU module:

1. From the *DACS II AX Main Menu* you can do one of the following:
 - Select *System Configuration*, then select *Slot Configuration*. Move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

The Configuration Manager menu displays.

Lucent Technologies		DACS II AX - System Manager		Slot:08	Help = [?]
Configuration Manager					
			Clear Channel Capability	Customer Control Loopback	Status
Port	Name	Data Rate			

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 14-3. 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 on a port number and press **<Enter>**. The Configuration menu displays.

The screenshot shows a terminal window titled 'Lucent Technologies DACS II AX System Manager Slot: 08 Help = [?]'. The main heading is 'Configuration'. Below it, the following parameters are listed:

```
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 14-4. Configuration Submenu

3. Configure all parameters for each port number.
 4. Press **X** to save changes.
 5. When prompted: "Update Configuration? Are you sure (Y/N)?" Type **Y**.
 6. Type **X** to return to the previous menu.
-

**Configuration
Menu Field
Descriptions**

These fields appear on the Quad OCU Configuration submenu ([Figure 14-4](#)).

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.

Quad OCU Main Menu

Access Main Menu To access the Main Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*.
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.

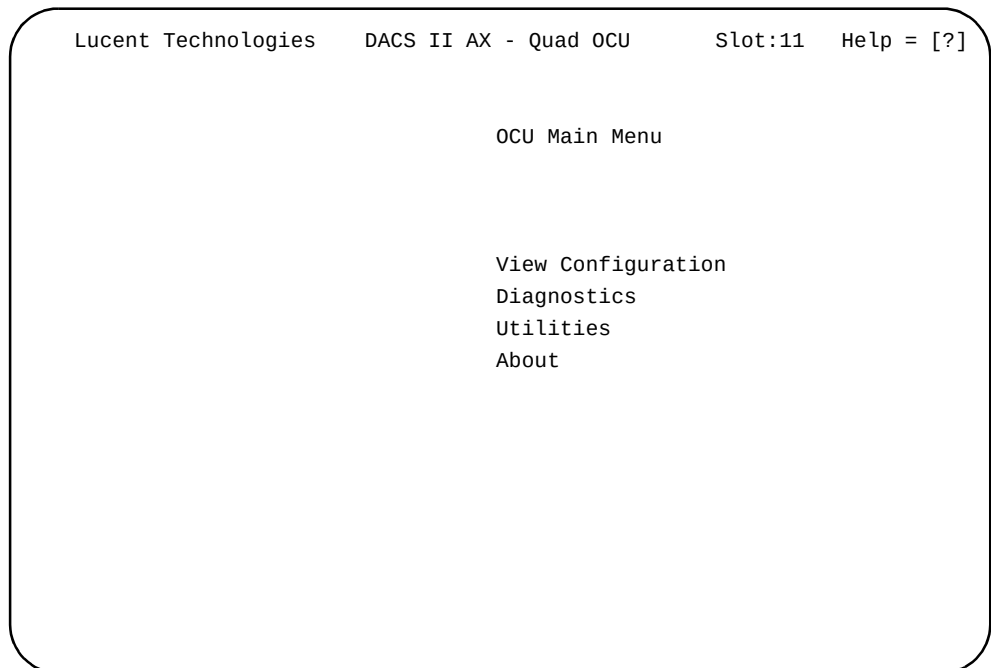


Figure 14-5. Quad OCU Main Menu

From the Quad OCU Main Menu you can display the module configuration, run diagnostic tests, access utilities, and display module identification (software revision levels). These procedures are detailed on the following pages.

View Configuration

Purpose The View Configuration option provides access to a display of the Quad OCU port configuration.

Related Task To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**. For details, refer to [Configure Quad OCU Ports: page 14-9](#).

Procedure To display the module configuration:

1. From the *Main Menu*, select *View Configuration*.
The Quad High Speed Port Configuration displays. The fields are described in [Configuration Menu Field Descriptions: page 14-11](#).
2. Press **X** to return to the previous menu.

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:

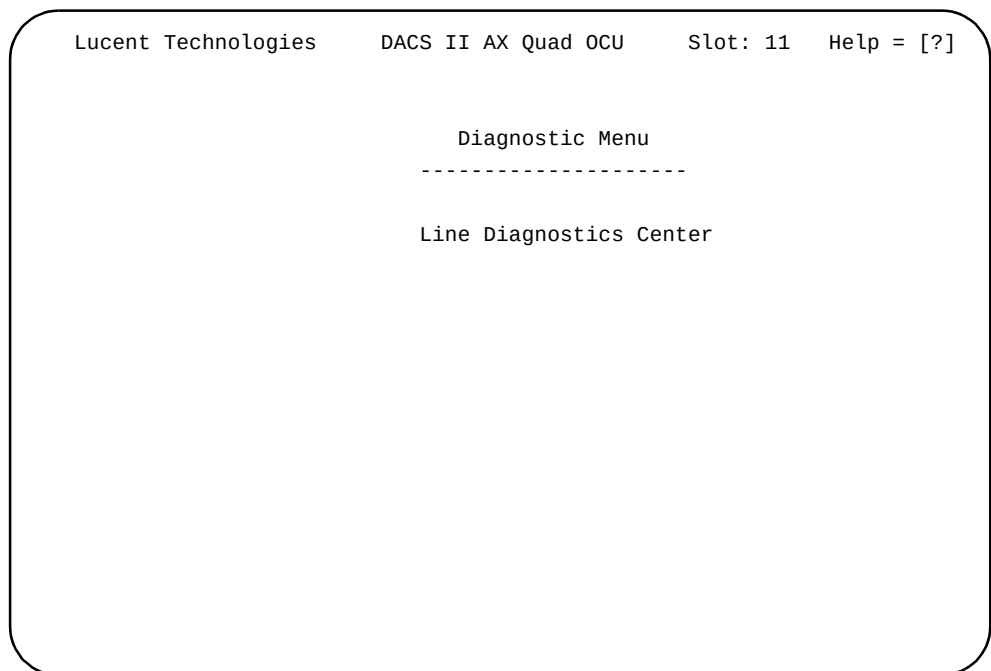


Figure 14-6. Diagnostic Menu

2. With the cursor on the *Line Diagnostics Center* field, press **<Enter>**. The following menu appears:

Lucent Technologies
DACS II AX Quad OCU
Slot: 08
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
Loop [O]ff	[C]lear Counters	Insert [E]rror	[B]ackplane
BERT: [2]047	[5]11	[6]3	All [1]'s
			All [0]'s
			Of[f]

Figure 14-7. Diagnostic Monitor Menu

- Place your cursor on the port number to be configured by using the **<BackSpace>/<SpaceBar>** to toggle between ports.
- 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.
- 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 14-7](#)).

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 14-8](#) 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.

Table 14-1. Loopback Test Descriptions

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.

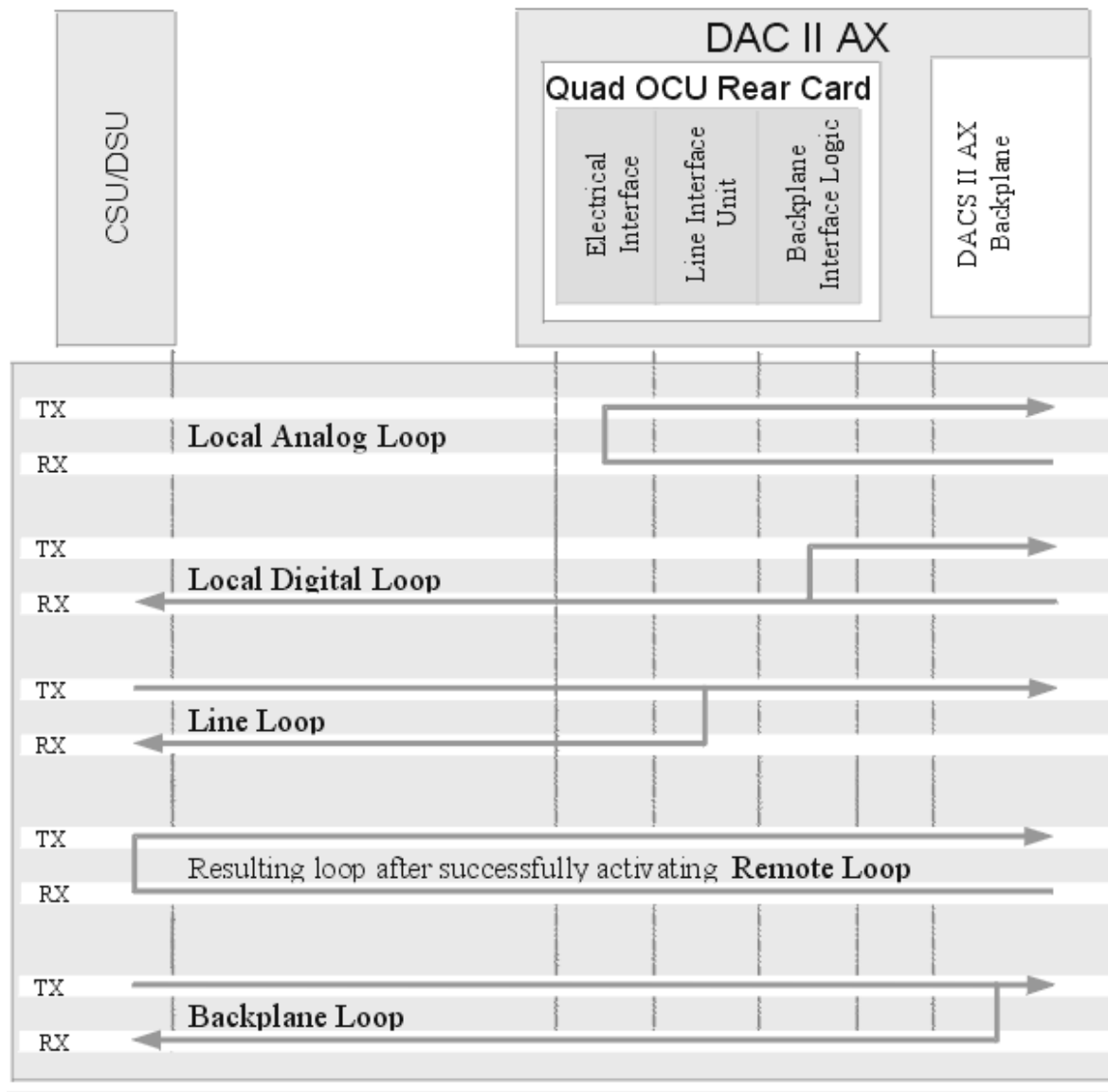


Figure 14-8. Quad OCU Loops

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 QOCU 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:

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:

```
Lucent Technologies    DACS II AX - Quad OCU    Slot: 08    Help = [?]  
  
OCU Utilities  
  
Board Status: In Service  
Monitor System Clocks  
Backplane Integrity  
Reset OCU Board
```

Figure 14-9. 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:

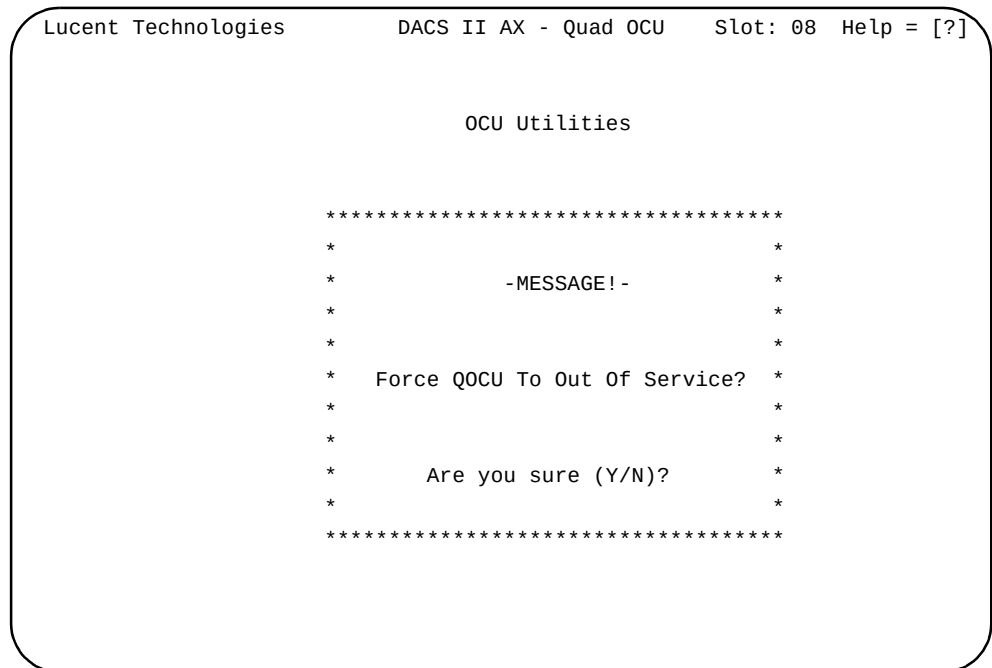


Figure 14-10. Board Status Screen

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:

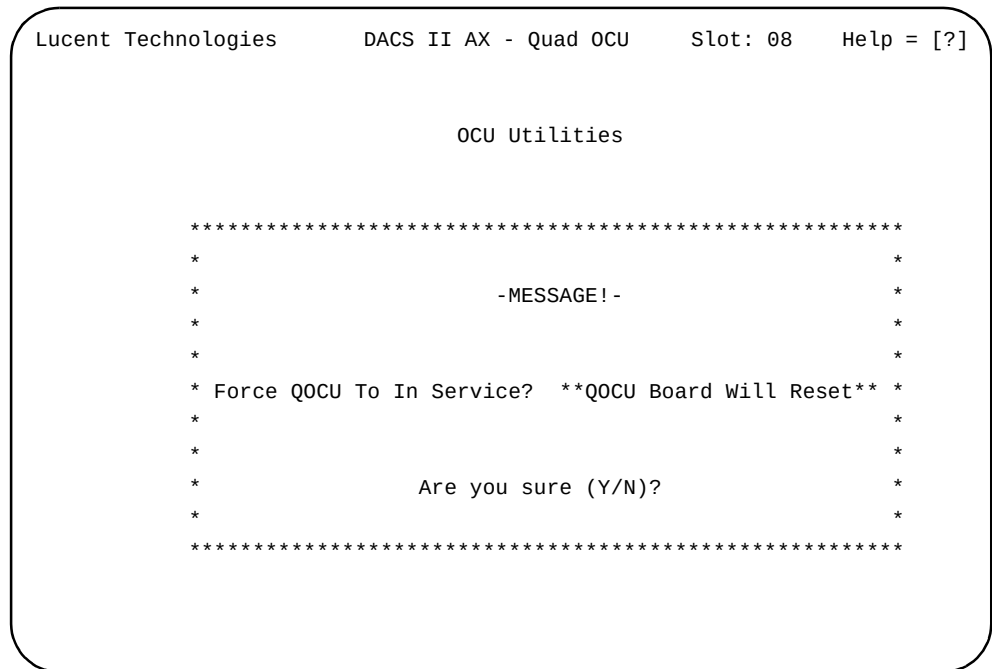


Figure 14-11. Out of Service Board Status Screen

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:

```
Lucent Technologies      DACS II AX - Quad OCU      Slot: 08  Help = [?]  
  
Monitor System Clocks  
  
Backplane Status.....: On the Bus  
Lost System Clock Count.: 0  
Lost Frame Sync Count...: 1  
  
[R]eset Counters
```

Figure 14-12. 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: 08 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 14-13. 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 14-13](#)).

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:

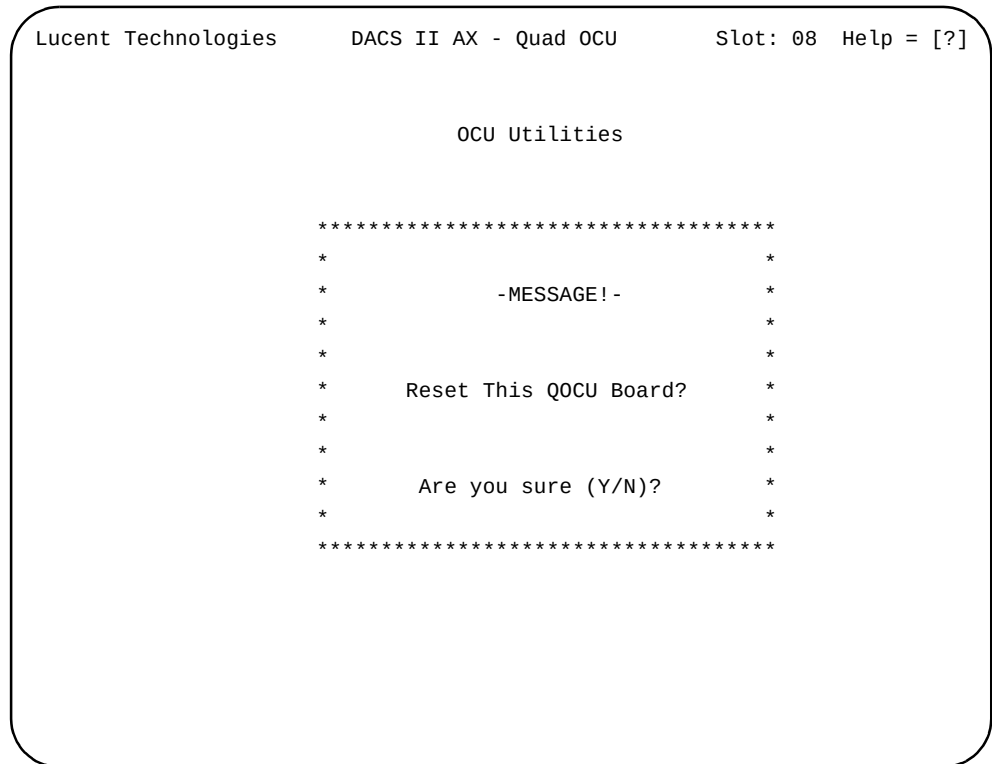


Figure 14-14. Reset QOCU Board

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.

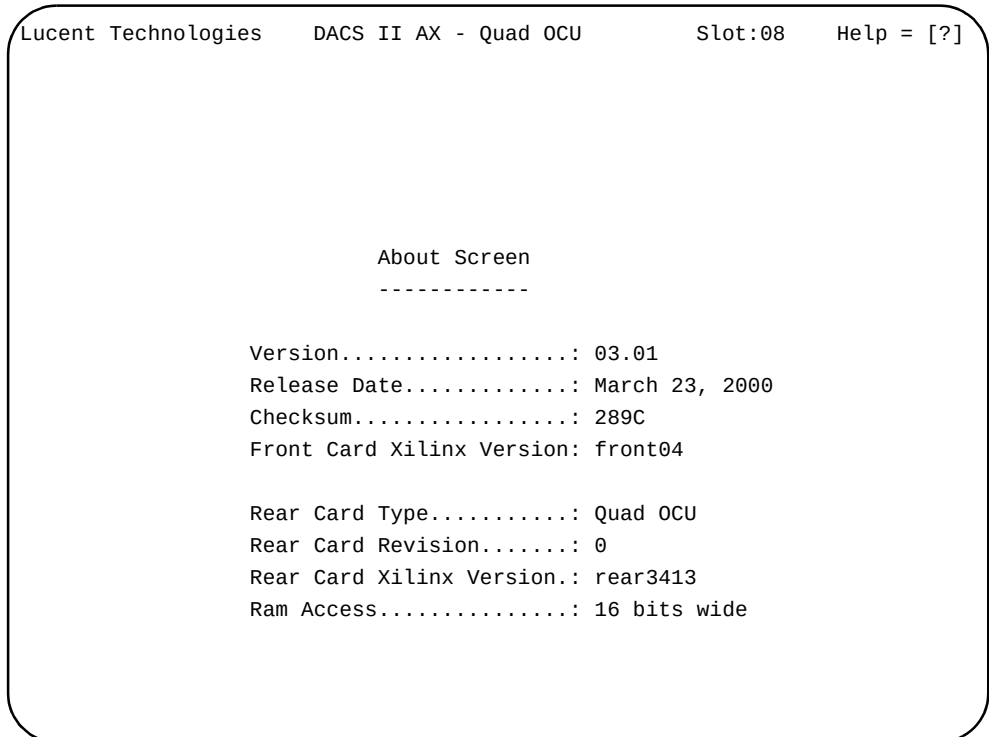
About Menu

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:



```
Lucent Technologies   DACS II AX - Quad OCU   Slot:08   Help = [?]  
  
About Screen  
-----  
  
Version.....: 03.01  
Release Date.....: March 23, 2000  
Checksum.....: 289C  
Front Card Xilinx Version: front04  
  
Rear Card Type.....: Quad OCU  
Rear Card Revision.....: 0  
Rear Card Xilinx Version.: rear3413  
Ram Access.....: 16 bits wide
```

Figure 14-15. Quad OCU About Screen

About Menu Field Descriptions

These fields appear on the Quad OCU About screen ([Figure 14-15](#)).

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.

Contents

■ Physical Description	<u>15-5</u>
■ Regulatory Information	<u>15-6</u>
North America	<u>15-6</u>
Product Safety	<u>15-6</u>
■ Before You Begin	<u>15-7</u>
■ Configure Slot for Quad DS-1	<u>15-8</u>
Configure Slot	<u>15-8</u>
■ Configure DS-1 Ports	<u>15-9</u>
Description	<u>15-9</u>
Before You Begin	<u>15-9</u>
Procedure - Configure Ports	<u>15-9</u>
LEDS Display	<u>15-11</u>
Configuration Menu Field Descriptions	<u>15-11</u>
■ Main Menu	<u>15-13</u>
Procedure	<u>15-13</u>
■ View Configuration	<u>15-14</u>
Purpose	<u>15-14</u>
Related Task	<u>15-14</u>
Procedure	<u>15-14</u>

■ Statistics Menu	<u>15-15</u>
Display ESF Statistics	<u>15-15</u>
■ ESF Statistics Field Descriptions	<u>15-17</u>
■ Display ESF Registers	<u>15-18</u>
■ ESF Registers Field Descriptions	<u>15-21</u>
■ Diagnostics Menu	<u>15-22</u>
Procedure	<u>15-22</u>
■ Diagnostics Menu Field Descriptions	<u>15-26</u>
■ DSL Port Management Menu	<u>15-27</u>
Procedure	<u>15-27</u>
■ Command Keys	<u>15-29</u>
■ View Span Status Screen	<u>15-30</u>
■ Span Status Field Descriptions	<u>15-31</u>
■ Set Clock Menu	<u>15-33</u>
■ System Settings Menu	<u>15-34</u>
■ System Settings Field Descriptions	<u>15-35</u>
■ Loopback Menu	<u>15-38</u>
■ View Performance Data Menu	<u>15-41</u>
■ Performance History Menu	<u>15-43</u>
■ Alarm History Menu	<u>15-44</u>
■ Alarm History Field Descriptions	<u>15-45</u>
■ Circuit ID# Menu	<u>15-46</u>
■ Utilities Menu	<u>15-47</u>
Procedure	<u>15-47</u>
■ Monitor Backplane Integrity Field Descriptions	<u>15-53</u>
Access Voice Control Signal Display	<u>15-53</u>
■ Voice Control Signal Field Descriptions	<u>15-55</u>
Dump Connection Statistics	<u>15-56</u>
■ Dump Connection Statistics Field Descriptions	<u>15-57</u>
Access Trunk Conditioning	<u>15-57</u>
■ Reload and Refresh the Connection Map Menu	<u>15-59</u>
■ About Menu	<u>15-60</u>
Procedure	<u>15-60</u>
■ About Menu Field Descriptions	<u>15-61</u>
■ Specifications	<u>15-62</u>
HDSL Module	<u>15-63</u>

HDSL Interface	<u>15-65</u>
Locally-Powered HDSL Configuration	<u>15-65</u>
Line Grounding	<u>15-66</u>
PCB Rev. 0 Resistor Jumper	<u>15-66</u>
Indicators	<u>15-66</u>
■ DIP Switch Settings	<u>15-67</u>

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.

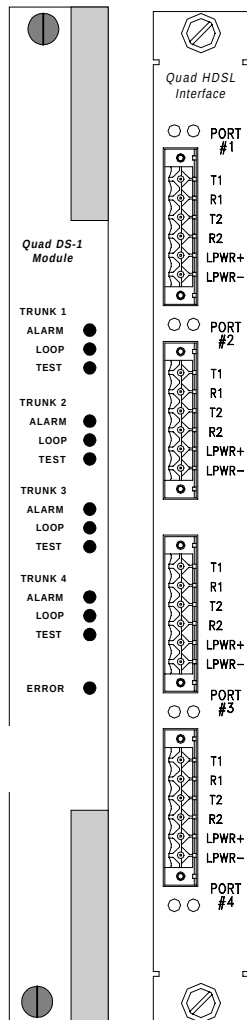


Figure 15-1. Quad DS-1 Application with xDSL Interface Module Set

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

- 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.
-

Configure Slot for Quad DS-1

Configure Slot Configure a slot for the Quad DS-1 module. Refer to [Configuring a Slot: page 4-8](#).

Configure DS-1 Ports

Description Before creating cross-connects to a Quad DS-1 module, specify values for the communications parameters used for each Quad DS-1 port.

Before You Begin Make sure that the slot has been configured for Quad DS-1.

Procedure - Configure Ports To configure the ports for a Quad DS-1 module:

1. From the *DACS II AX Main Menu*, you can do one of the following:
 - Select *Slot Configuration*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

The following menu appears:

Lucent Technologies . DACS II AX 11 - System Manager 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 15-2. 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.



NOTE:

Configuration parameters are determined by your local carrier.

3. Press **X** to save changes.

The following message appears:

Update configuration?Are you sure (Y/N)?

4. Press **Y(es)** to save your changes or press **N(o)** to cancel changes and return to previous menu.
-

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 15-2):

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.

Main Menu

Procedure

To access the Main Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*.
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.

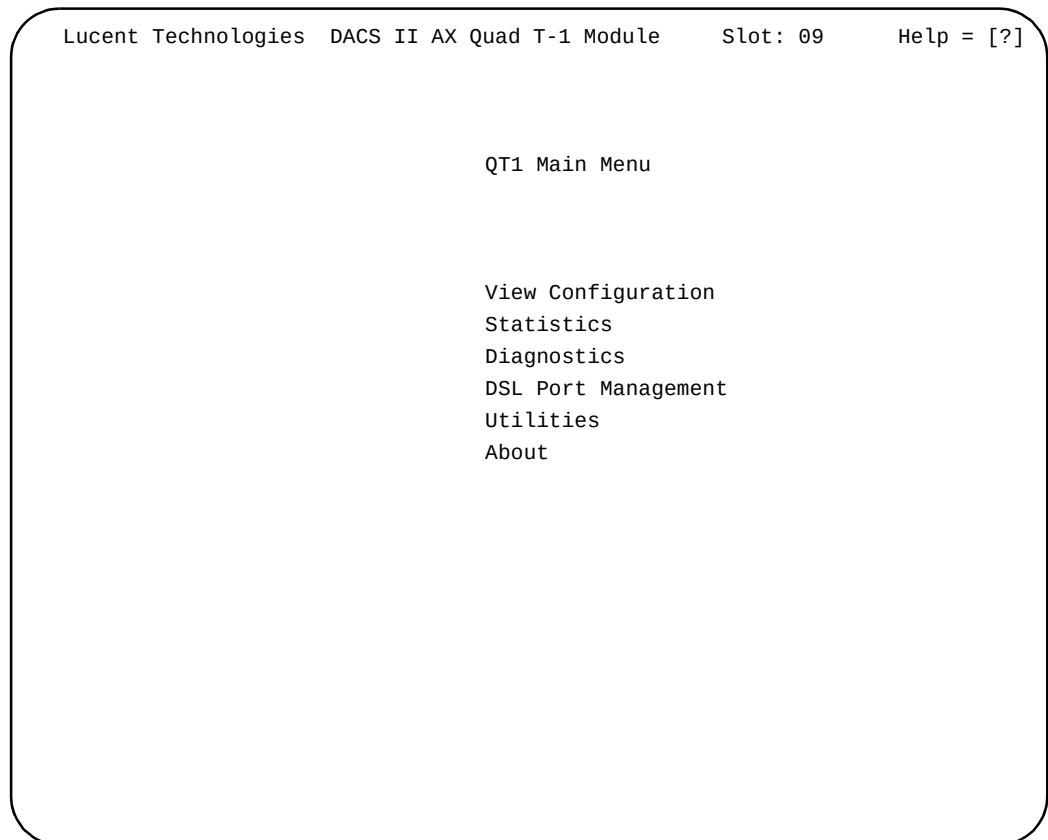


Figure 15-3. Quad DS-1 Main Menu with DSL Port Management

From the Quad DS-1 Main Menu you can display the module configuration, display statistics, run diagnostic tests, manage ports, access utilities, and display module identification (software revision levels). These procedures are detailed on the following pages.

View Configuration

Purpose The View Configuration option provides access to a display of the DS-1 port configuration.

Related Task To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**. For details, refer to [Configure DS-1 Ports: page 15-9](#).

Procedure To display the DS-1 module configuration:

1. From the DS-1 *Main Menu*, select *View Configuration*.
The Quad T-1 Port Configuration displays. The fields are described in [Configuration Menu Field Descriptions: page 15-11](#).
2. Press **X** to return to the previous menu.

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:

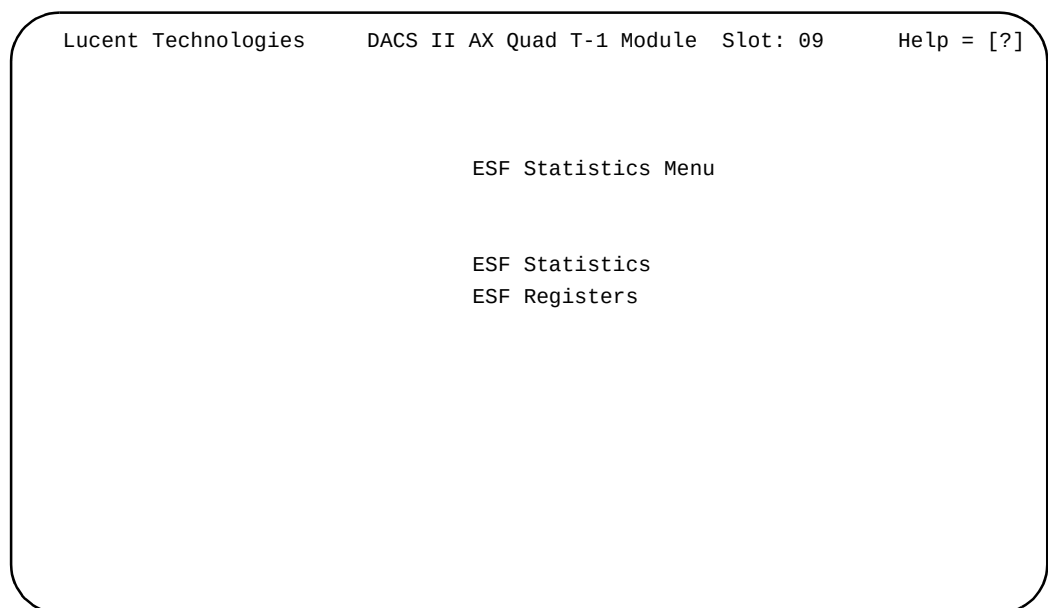


Figure 15-4. ESF Statistics Menu

- 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 15-5. ESF Statistics Screen

- 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:

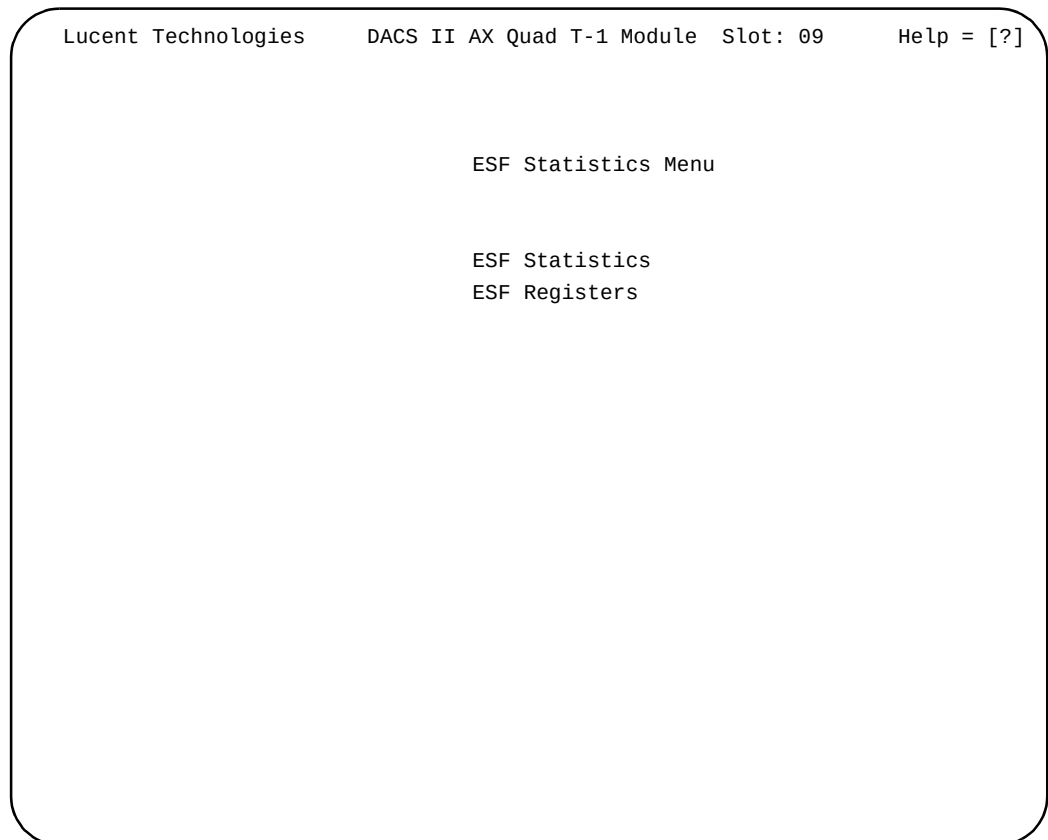


Figure 15-6. ESF Statistics Menu

2. Place the cursor on the *ESF registers* field and press **<Enter>**. The following submenu appears:

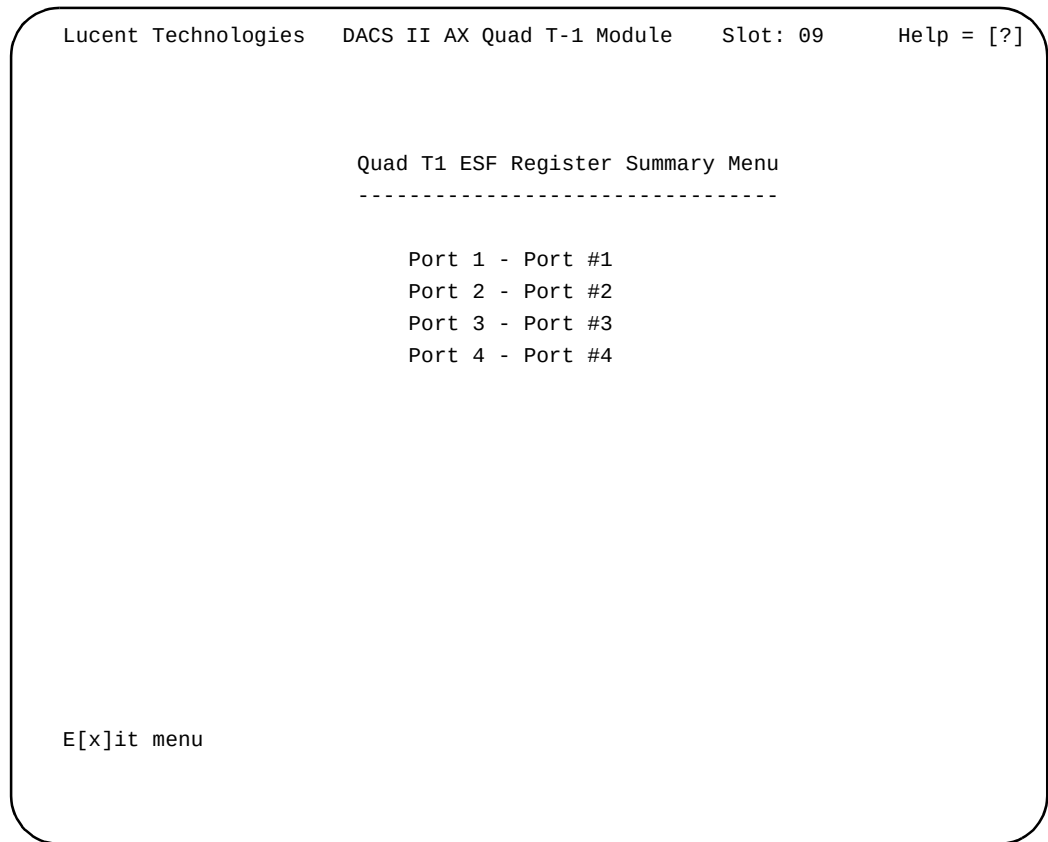


Figure 15-7. ESF Registers Summary Submenu

- 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 15-8. 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 15-9. 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:

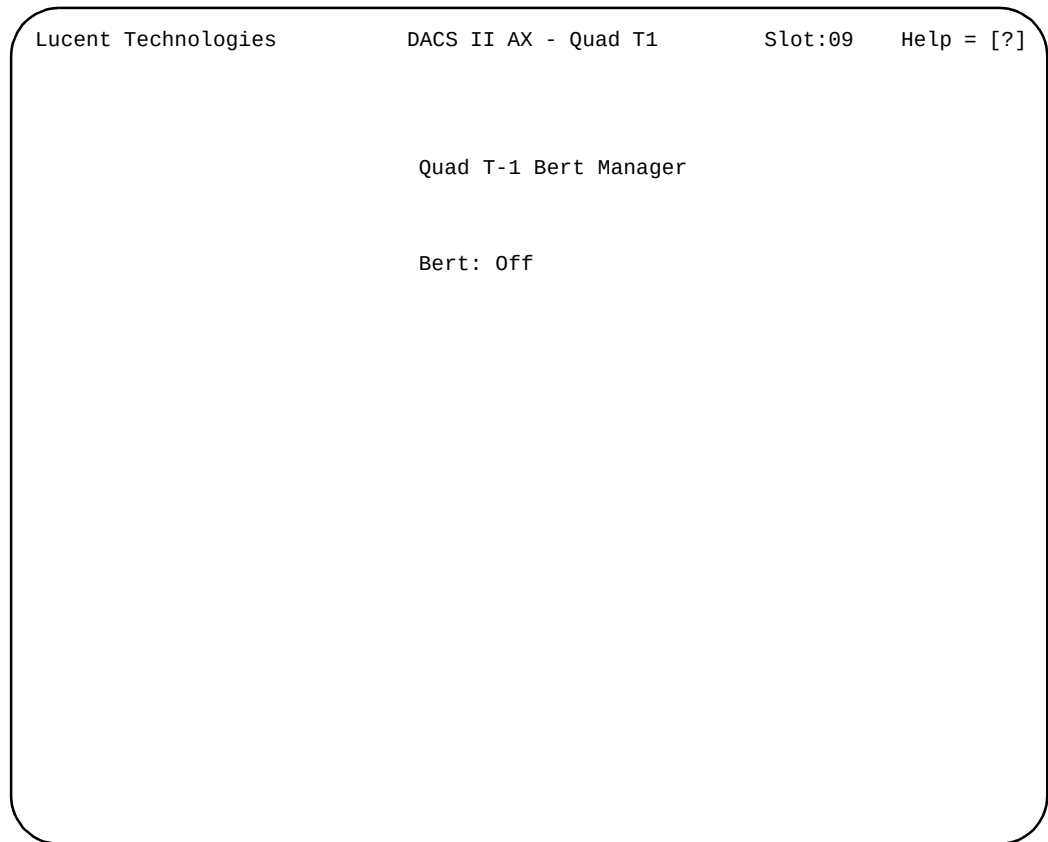


Figure 15-10. Quad DS-1 BERT Manager Menu

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:

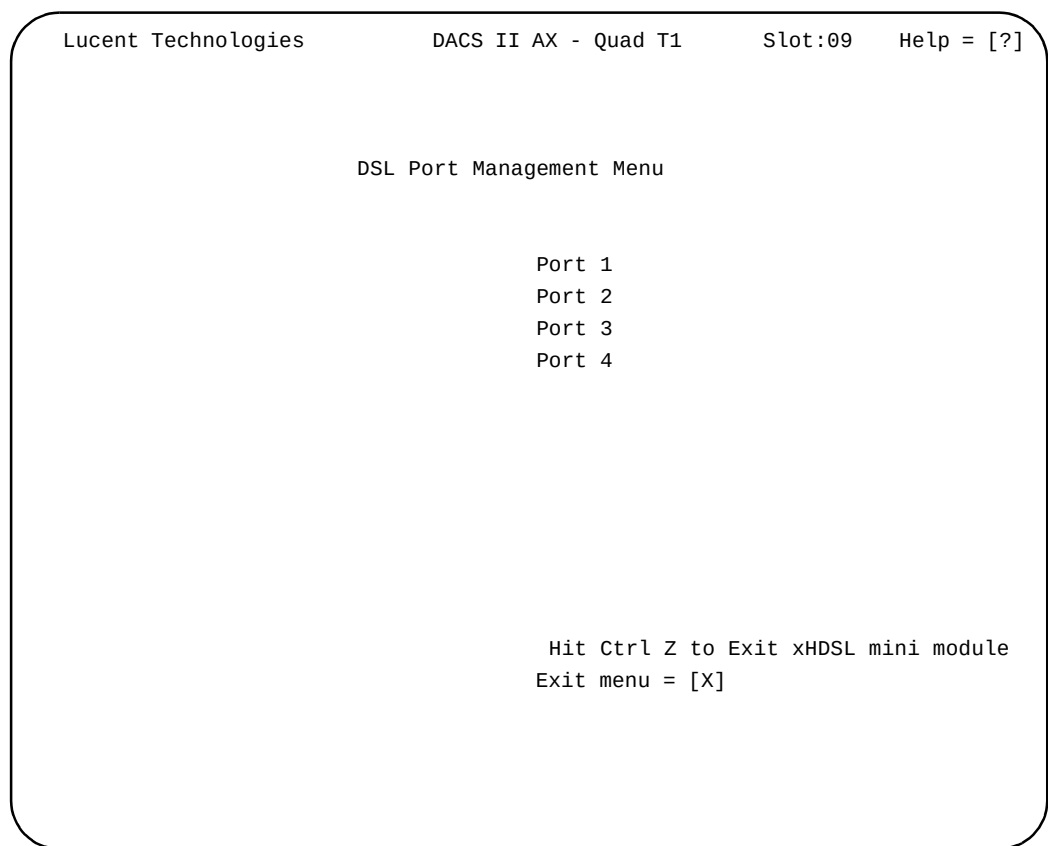


Figure 15-11. DSL Port Management Menu

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.

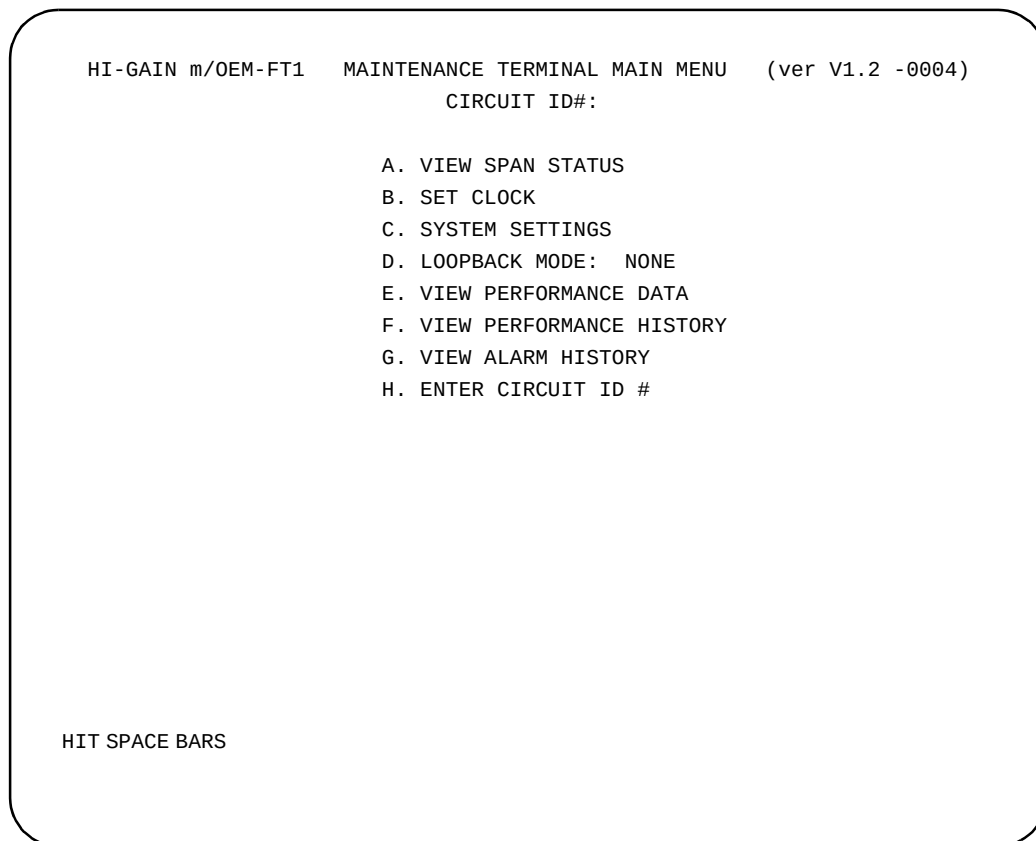


Figure 15-12. Maintenance Terminal Main Menu

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 15-13. 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 15-14. 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 15-15. 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)BTSI:

- *On* - ESF frame operates in the ZBTSI mode.
- *Off* - ESF frame operates in the normal (non-ZBTSI) 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 15-16. 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.

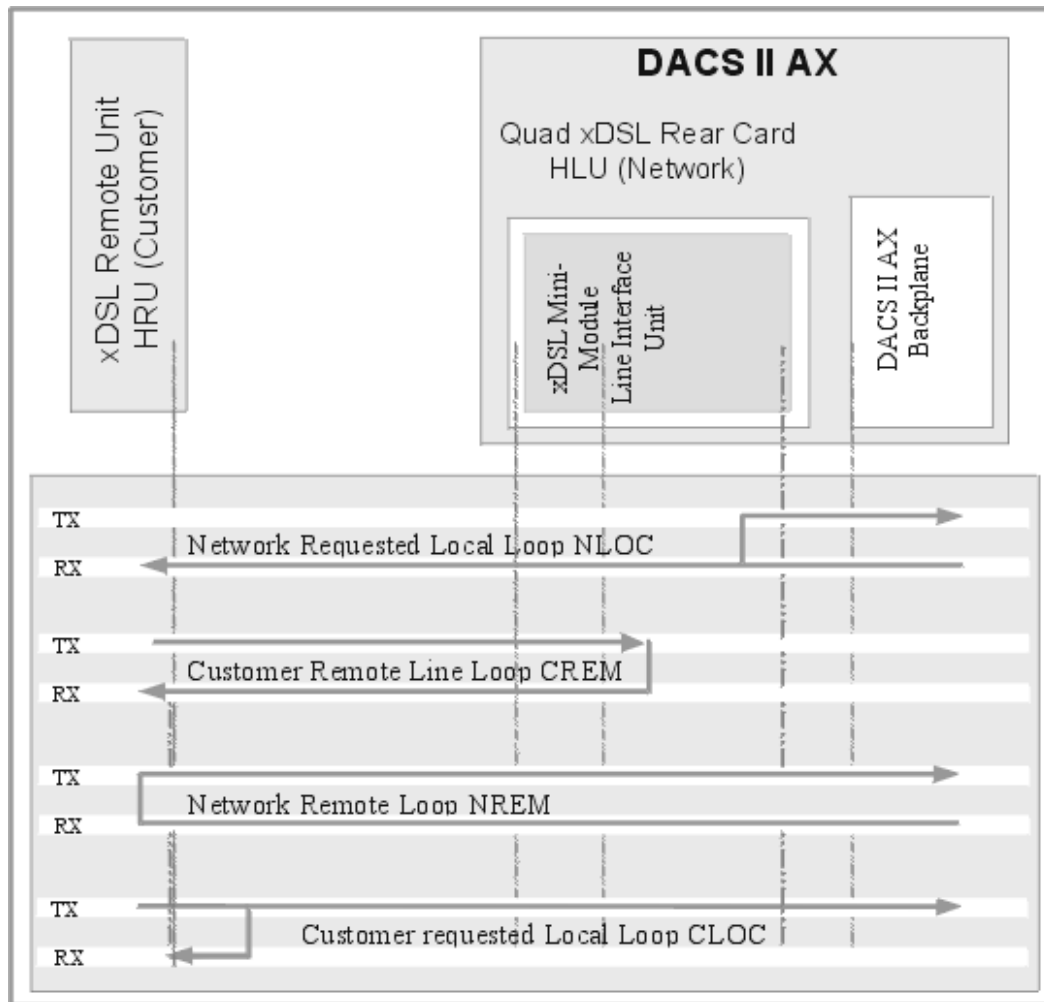


Figure 15-17. Quad DS-1 with xDSL Loops

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 15-18. 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).

- ```

Time: 19:23:49
CIRCUIT ID#:

7 DAY HISTORY

ERRORED SECONDS/UNAVAILABLE SECONDS

DS1
HLU HRU
09/30 00000/00000 00000/00000
10/01 00000/00000 00000/00000
10/02 00000/00000 00000/00000
10/03 00000/00000 00000/00000
10/04 00000/00000 00000/00000
10/05 00000/00000 00000/00000
10/06 00000/00000 00000/00000
current 00000/00000 00000/00000

HDSL
HLU HRU
09/30 00000/00000 00000/00000
10/01 00000/00000 00000/00000
10/02 00000/00000 00000/00000
10/03 00000/00000 00000/00000
10/04 00000/00000 00000/00000
10/05 00000/00000 00000/00000
10/06 00000/00000 00000/86398
current 00000/00000 00000/70200

(E)xit

```

2. Press **E** to exit. The *Maintenance Terminal Main Menu* appears.



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, HDL    | 07/13/97-01:11 | 07/13/97-01:11 | ALARM   | 001   |
| ES, HDL      |                |                | OK      | 000   |
| MARGIN LP    |                |                | OK      | 000   |

LAST CLEARED: 07/13/97-01:11

(E)xit (C)lear (U)pdate

**Figure 15-20. 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 15-21. 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:

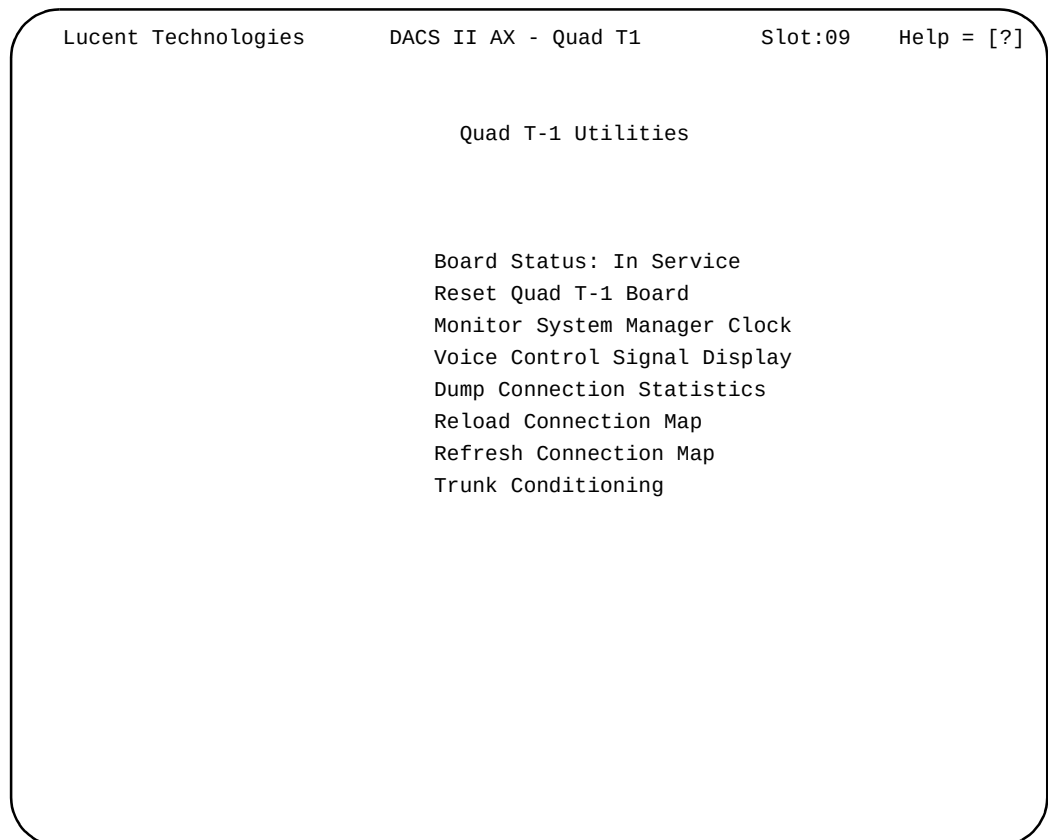


**Figure 15-22. Quad DS-1 Utilities Menu**

## 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:

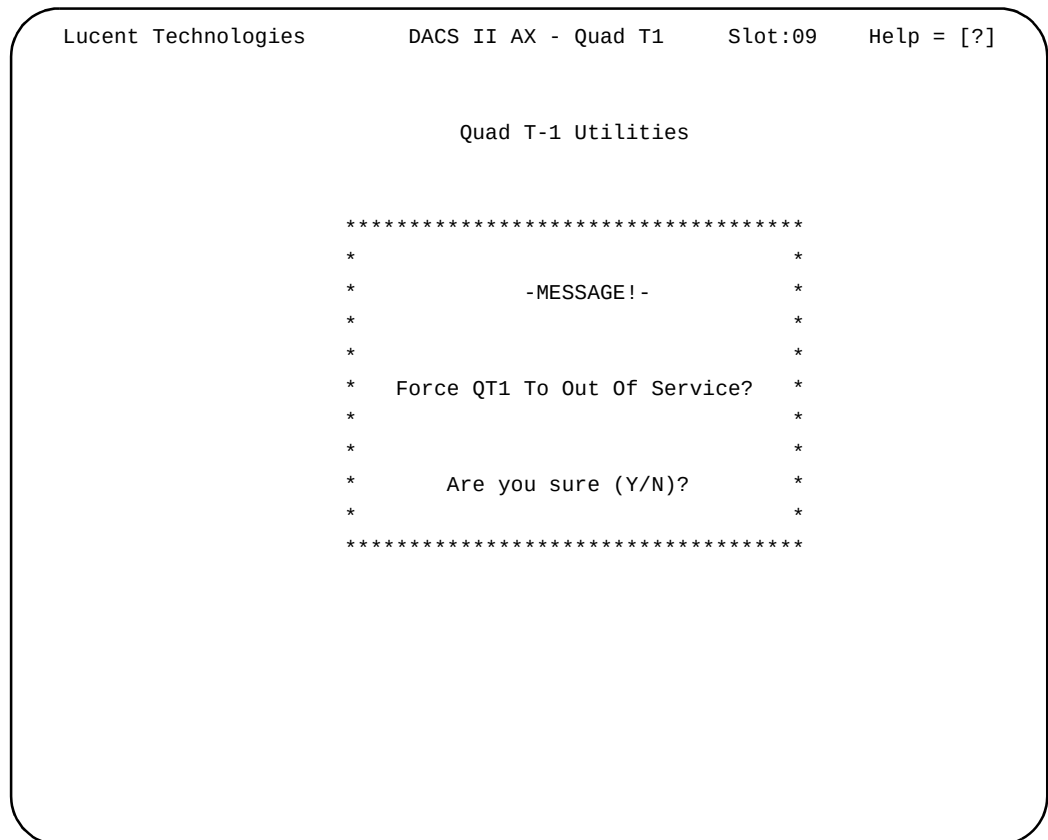


**Figure 15-23. Board Status Screen**

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:

```

Lucent Technologies DACS II AX - Quad T1 Slot:09 Help = [?]

 Quad T-1 Utilities

* *
* -MESSAGE! - *
* *
* *
* Force QT1 To In Service? **QT1 Board Will Reset** *
* *
* Are you sure (Y/N)? *
* *

```

**Figure 15-24. 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:

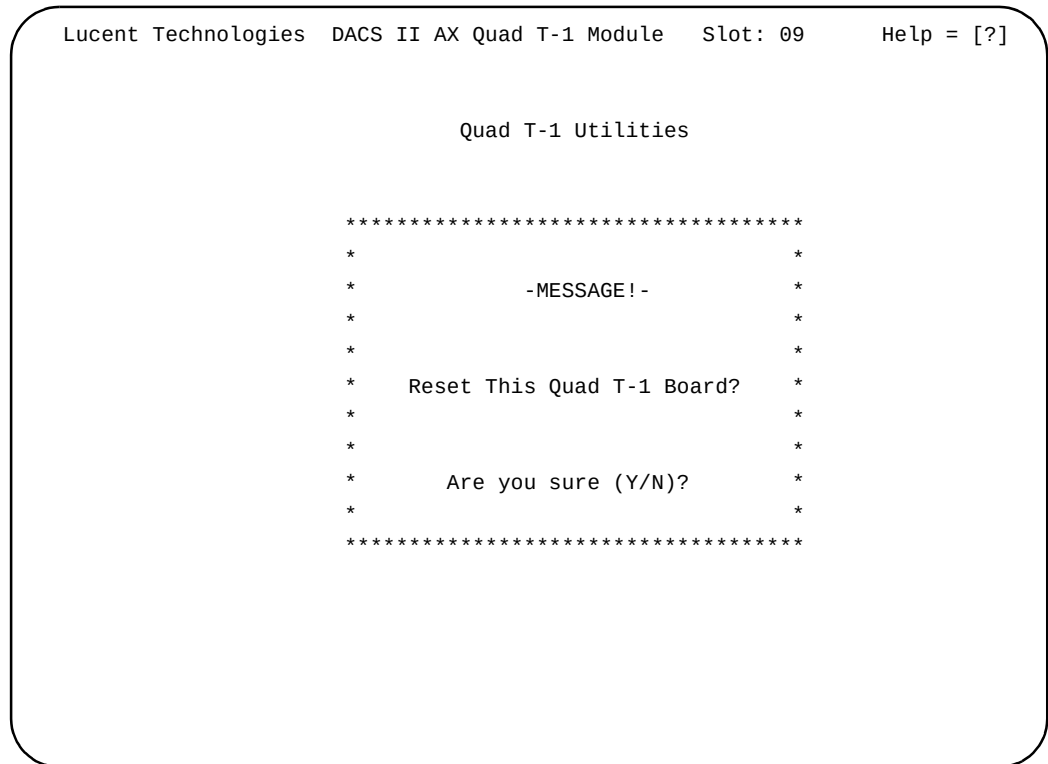


**Figure 15-25. Reset Quad DS-1 Board Screen**

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 15-26. 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         |         | -----   |    |            |  |
| 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 15-27. 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 15-28. 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.

---

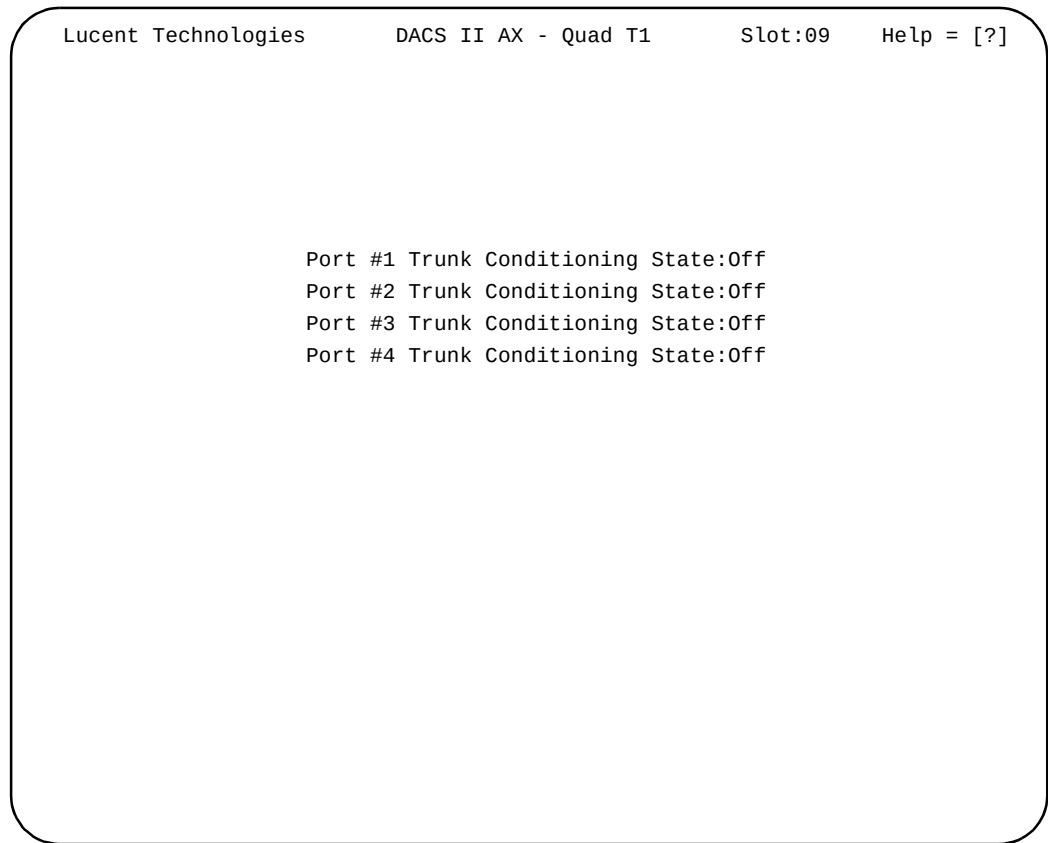
### Access Trunk Conditioning

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 15-29. 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.

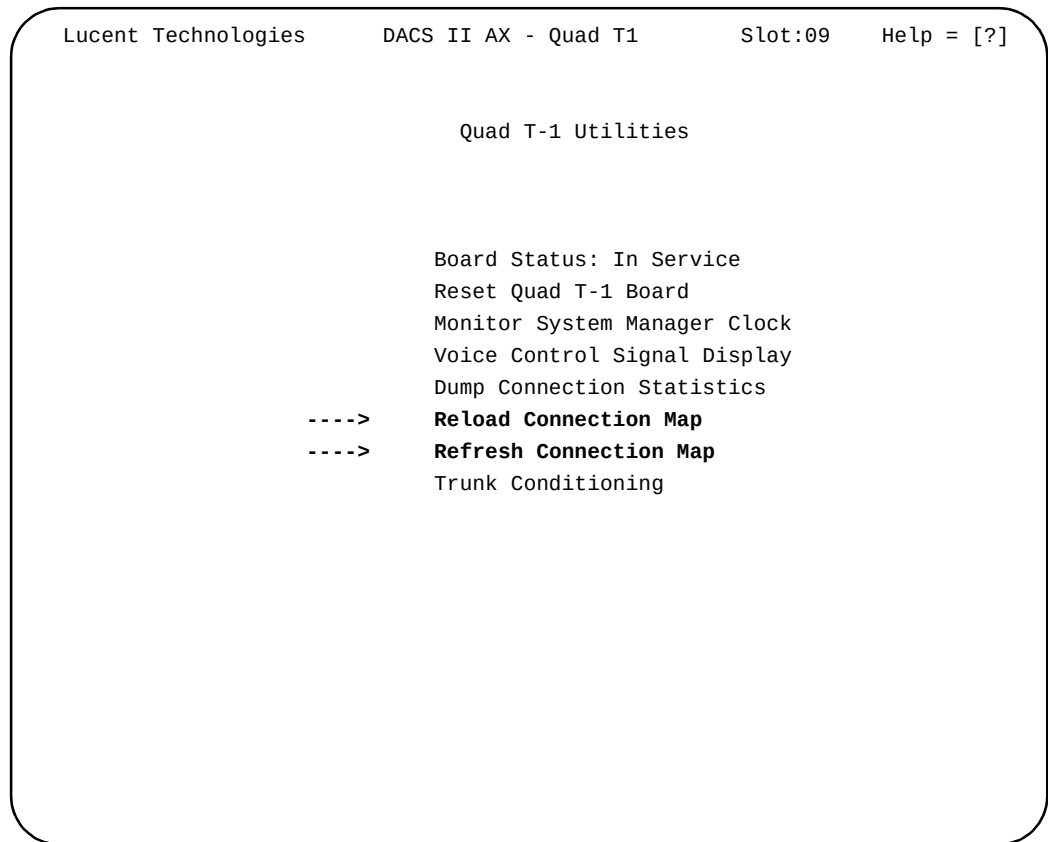


**Figure 15-30. Reload and Refresh Connection Map Fields**

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

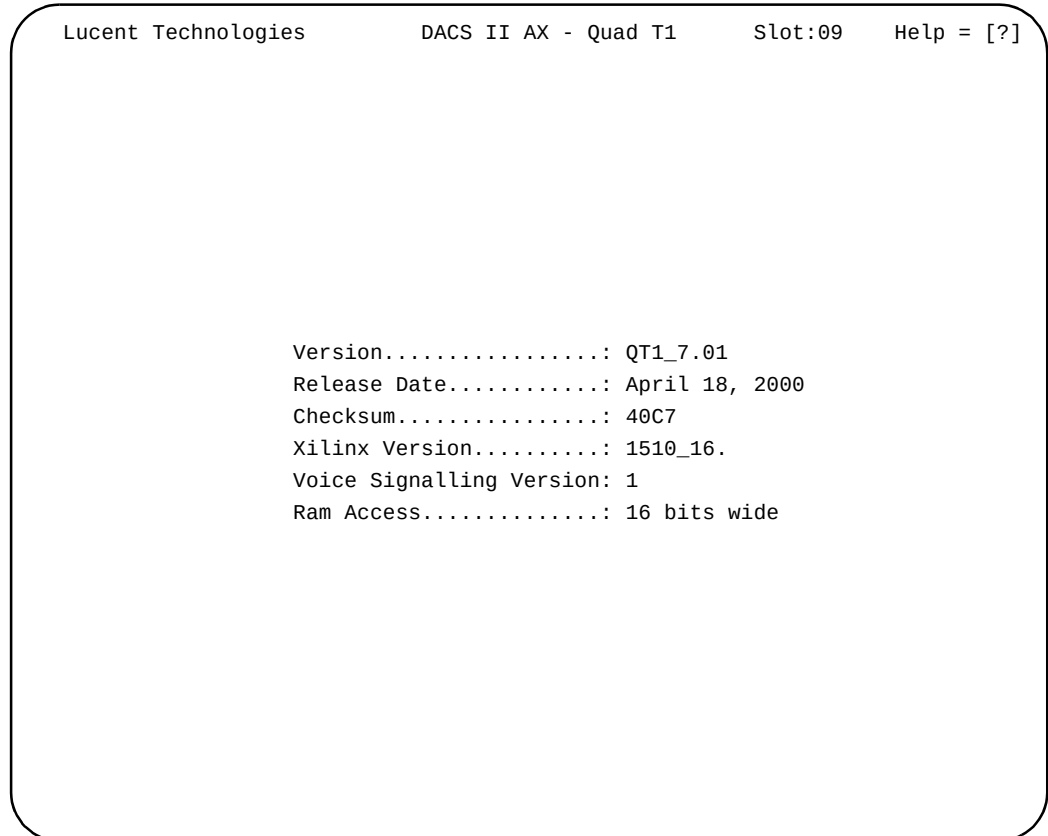
---

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 15-31. 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.

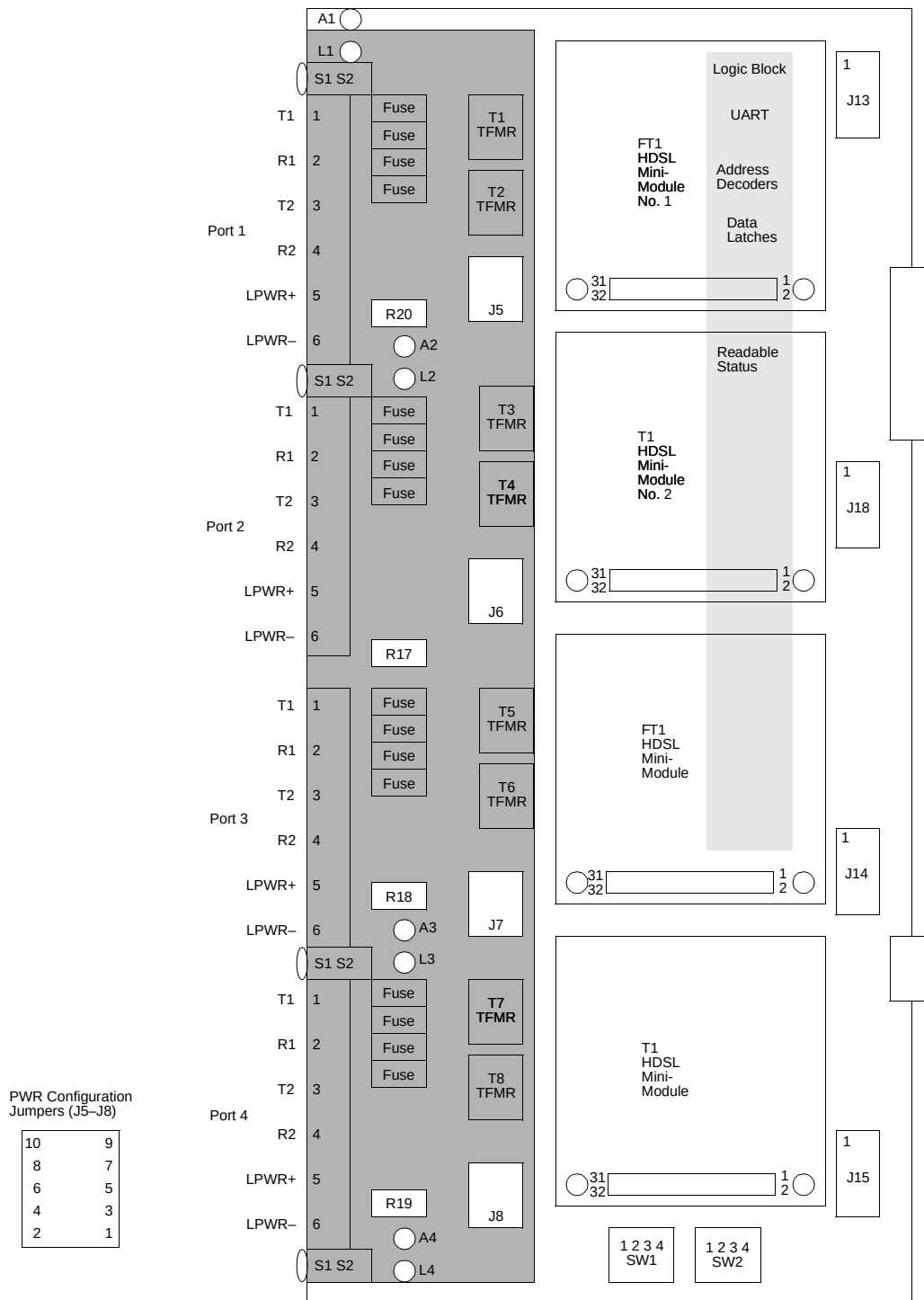
**Table 15-3. Quad DS-1 with xDSL Module Specifications**

|                            |                                                                                                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Loop Technology</b>     | Modulation type: 2B1Q<br>Mode: Full duplex, echo cancellation<br>Number of Pairs: 2 for T-1/E-1; 1 for FT-1                                                                                                                |
| <b>HDSL Bit Rate</b>       | T-1: 784 kbps/pair<br>E-1: 1040 kbps/pair<br>FT-1: 784 kbps (1 pair)                                                                                                                                                       |
| <b>Status Indicators</b>   | Loop 1 & 2 synchronization<br>HDSL alarm<br>Loopback<br>Data Interface: T-1/FT-1 (1.544 Mbps); E-1 (2.048 Mbps)<br>Host Processor Communications Interface: Asynchronous 2-wire serial<br>Input/Output Levels: CMOS levels |
| <b>Environment</b>         | Operating temp: -40 <sup>0</sup> C to +85 <sup>0</sup> C (-140 <sup>0</sup> F to +185 <sup>0</sup> F)                                                                                                                      |
| <b>Physical Dimensions</b> | 2.5" W x 2.0" L x 0.38" H<br>6.35 cm W x 5.08 cm L x 0.95 cm H<br>32-pin connector to host board                                                                                                                           |



**HDSL Module**

The following figure is the HDSL module.



## HDSL Interface

**Table 15-4. Pin Assignments**

|              |                                                   |
|--------------|---------------------------------------------------|
| <b>Pin 1</b> | Data path to the HDSL Mini-Module                 |
| <b>Pin 2</b> | CPU Data from On-Board UART that is going to HDSL |
| <b>Pin 3</b> | +5V                                               |
| <b>Pin 4</b> | Data from HDSL Mini Module to UART                |
| <b>Pin 5</b> | Ground                                            |
| <b>Pin 6</b> | Not Used                                          |
| <b>Pin 7</b> | 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<br>(bottom position) | 3 & 4 | 5 & 6 | 7 & 8 | Not Used<br>(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**

| <b>SW1-1</b> | <b>SW1-2</b> | <b>Module 1 type at J9 for Port 1</b>  |
|--------------|--------------|----------------------------------------|
| ON           | ON           | <b>Module not installed</b>            |
| ON           | OFF          | <b>FT1</b>                             |
| OFF          | ON           | <b>T1</b>                              |
| OFF          | OFF          | <b>Undefined</b>                       |
|              |              |                                        |
| <b>SW1-3</b> | <b>SW1-4</b> | <b>Module 2 type at J10 for Port 2</b> |
| ON           | ON           | <b>Module not installed</b>            |
| ON           | OFF          | <b>FT1</b>                             |
| OFF          | ON           | <b>T1</b>                              |
| OFF          | OFF          | <b>Undefined</b>                       |
|              |              |                                        |
| <b>SW2-1</b> | <b>SW2-2</b> | <b>Module 3 type at J11 for Port 3</b> |
| ON           | ON           | <b>Module not installed</b>            |
| ON           | OFF          | <b>FT1</b>                             |

**Table 15-9. DIP Switch Settings**

|              |              |                                        |
|--------------|--------------|----------------------------------------|
| OFF          | ON           | <b>T1</b>                              |
| OFF          | OFF          | <b>Undefined</b>                       |
|              |              |                                        |
| <b>SW2-3</b> | <b>SW2-4</b> | <b>Module 4 type at J12 for Port 4</b> |
| ON           | ON           | <b>Module not installed</b>            |
| ON           | OFF          | <b>FT1</b>                             |
| OFF          | ON           | <b>T1</b>                              |
| OFF          | OFF          | <b>Undefined</b>                       |

## **Contents**

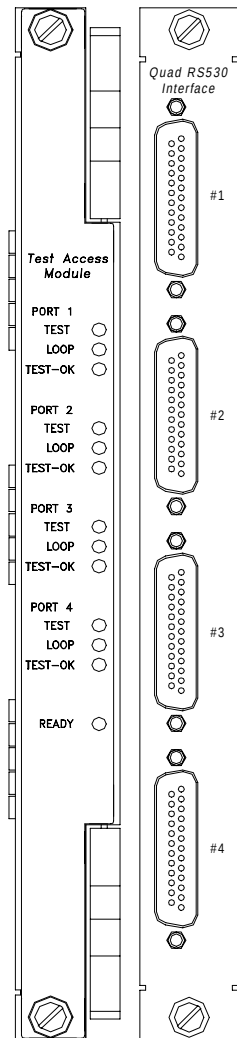
---

|                                           |                              |
|-------------------------------------------|------------------------------|
| ■ Physical Description                    | <a href="#"><u>16-3</u></a>  |
| ■ Regulatory Information                  | <a href="#"><u>16-4</u></a>  |
| North America                             | <a href="#"><u>16-4</u></a>  |
| Product Safety                            | <a href="#"><u>16-4</u></a>  |
| Europe                                    | <a href="#"><u>16-4</u></a>  |
| ■ Before You Begin                        | <a href="#"><u>16-5</u></a>  |
| Notes about the TAM Module                | <a href="#"><u>16-5</u></a>  |
| ■ Configure Slot for TAM Module           | <a href="#"><u>16-6</u></a>  |
| Configure Slot                            | <a href="#"><u>16-6</u></a>  |
| ■ Configure Connection to TAM             | <a href="#"><u>16-7</u></a>  |
| ■ Configure TAM Ports                     | <a href="#"><u>16-8</u></a>  |
| Purpose                                   | <a href="#"><u>16-8</u></a>  |
| Before You Begin                          | <a href="#"><u>16-8</u></a>  |
| Configure TAM Ports                       | <a href="#"><u>16-8</u></a>  |
| TAM Configuration Menu Field Descriptions | <a href="#"><u>16-9</u></a>  |
| ■ Test Access Main Menu                   | <a href="#"><u>16-11</u></a> |
| Access Test Access Main Menu              | <a href="#"><u>16-11</u></a> |
| ■ View Configuration                      | <a href="#"><u>16-12</u></a> |
| Purpose                                   | <a href="#"><u>16-12</u></a> |

|                                    |                              |
|------------------------------------|------------------------------|
| Related Task                       | <a href="#"><u>16-12</u></a> |
| Procedure                          | <a href="#"><u>16-12</u></a> |
| ■ Diagnostics Menu                 | <a href="#"><u>16-13</u></a> |
| View Diagnostics                   | <a href="#"><u>16-13</u></a> |
| Set Local Loop                     | <a href="#"><u>16-14</u></a> |
| Set Remote Loop                    | <a href="#"><u>16-16</u></a> |
| Set up BERT                        | <a href="#"><u>16-19</u></a> |
| Diagnostics Field Descriptions     | <a href="#"><u>16-21</u></a> |
| ■ Utilities Menu                   | <a href="#"><u>16-24</u></a> |
| Access TAM Utilities               | <a href="#"><u>16-24</u></a> |
| Reset Board                        | <a href="#"><u>16-25</u></a> |
| ■ About Menu                       | <a href="#"><u>16-27</u></a> |
| Display Identification Information | <a href="#"><u>16-27</u></a> |
| About Field Descriptions           | <a href="#"><u>16-28</u></a> |



## 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**

---

### **Notes about the TAM Module**

- A slot must be configured for the TAM module.
  - The TAM application module and Quad RS530 High Speed rear interface must be physically present in the DACS II AX chassis.
  - For cabling and interface requirements, refer to Appendix B.
  - The TAM can be used to test cross-connections. Refer to Chapter 5 for information on adding cross-connections and using maps.
  - For cabling and interface requirements, see Appendix B.
-

## **Configure Slot for TAM Module**

---

**Configure Slot**      Configure a slot for the TAM module. Refer to [Configuring a Slot: page 4-8](#).

---

## **Configure Connection to TAM**

---

To use the TAM for testing a connection:

1. Configure a connection using the Add a Connection procedure in Chapter 5. Choose data in the Type field. The TAM only executes and/or monitors test data patterns at 48 Kbps to 2.048 Mbps.
  2. Put the connection into test. Refer to the Testing a Connection procedure in Chapter 5. For Test id, choose a test type: monitor-source, monitor-destination, split-souce, or split-destination. In the TESTER slot.port field, enter the TAM's slot and the port that will be used.
  3. Configure the TAM port. The Speed field will automatically be filled in, based on the speed of the original connection.
  4. Run TAM diagnostics.
  5. After testing or monitoring the connections, restore the original connection by pressing R from the Map Configuration menu.
-

## Configure TAM Ports

---

**Purpose** Use this procedure to configure the ports on the TAM.

---

**Before You Begin** Make sure that the slot has been configured for the TAM.

---

### Configure TAM Ports

To configure TAM parameters:

1. From the *DACS II AX Main Menu* you can do one of the following:
  - Select *System Configuration*, then select *Slot Configuration*. Move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
  - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
  - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.



**NOTE:**

You must use the **P** key to configure the module. If you go through the module's Main Menu, you will access view-only configuration screens.

The **P** key will not work for slots 1 and 11 if they are set up for redundancy.

The following menu appears:

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  |

**Figure 16-2. 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 [TAM Configuration Menu Field Descriptions: page 16-9](#).
3. Press **X** to save changes.

The following message appears:

*Update configuration?Are you sure (Y/N)?*

4. Press **Y(es)** to save your changes or press **N(o)** to cancel changes and return to previous 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.

---



## Test Access Main Menu

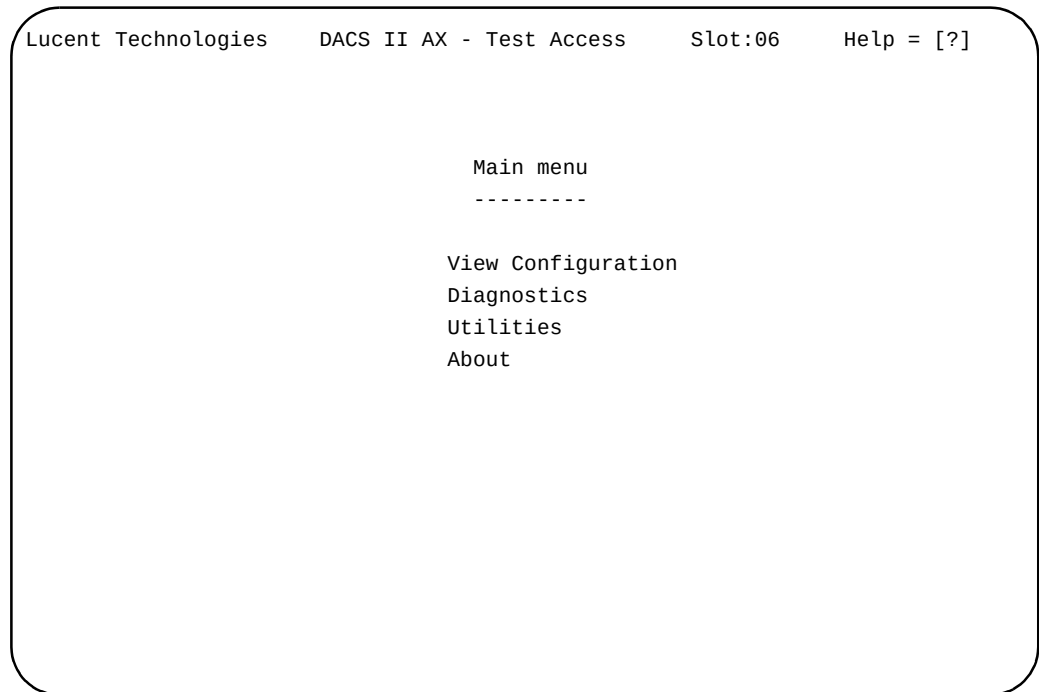
---

### Access Test Access Main Menu

To access the Test Access Main Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*.
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 16-3. TAM Main Menu**

From the TAM Main Menu you can display the module configuration, run diagnostic tests, access utilities, and display module identification (software revision levels).

---

## View Configuration

---

**Purpose** The View Configuration option provides access to a display of the TAM port configuration.

---

**Related Task** To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**. For details, refer to [Configure TAM Ports: page 16-8](#).

---

**Procedure** To display the module configuration:

1. From the TAM *Main Menu*, select *View Configuration*.  
The TAM Port Configuration displays. The fields are described in [TAM Configuration Menu Field Descriptions: page 16-9](#).
2. Press **X** to return to the previous menu.

---

## 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         | 0         |
| Local err-secs.: 0 | 0         | 0         | 0         | 0         |
| Remote err-secs: 0 | 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

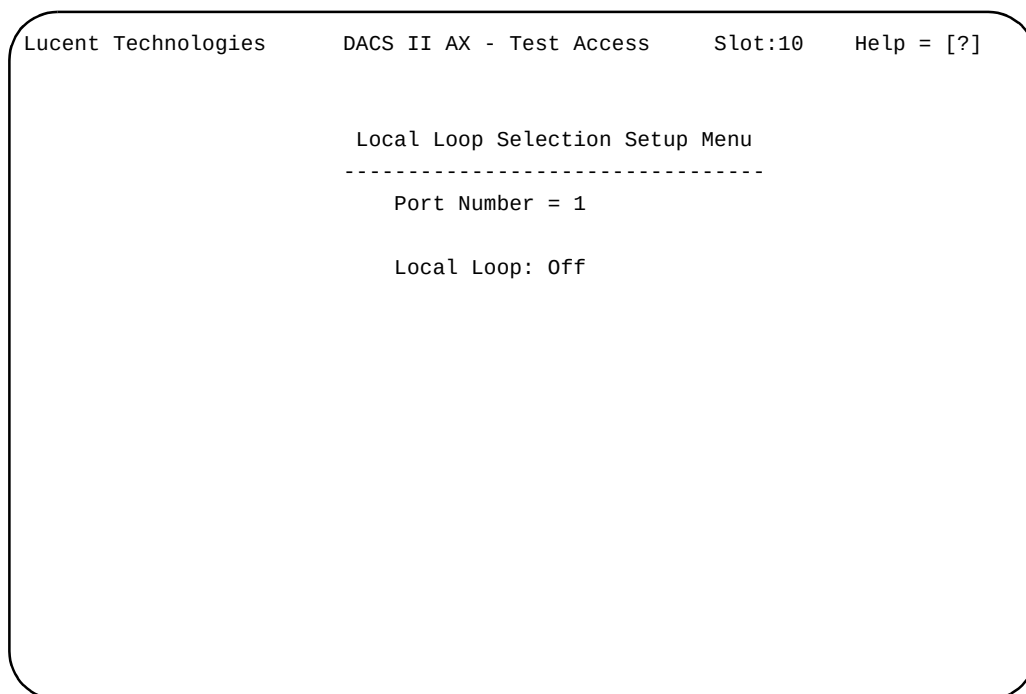
**Figure 16-4. Diagnostics Menu**

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

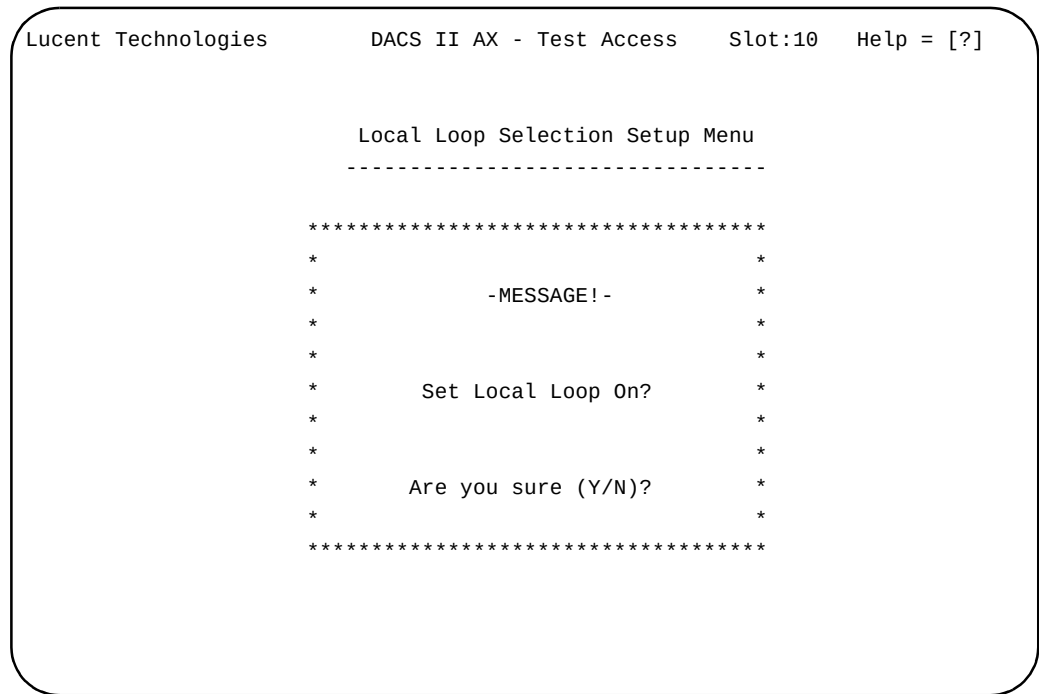
Local Loop: Off
```

---

**Figure 16-5. 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 16-6. 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 16-7. 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 **<b>** 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*.

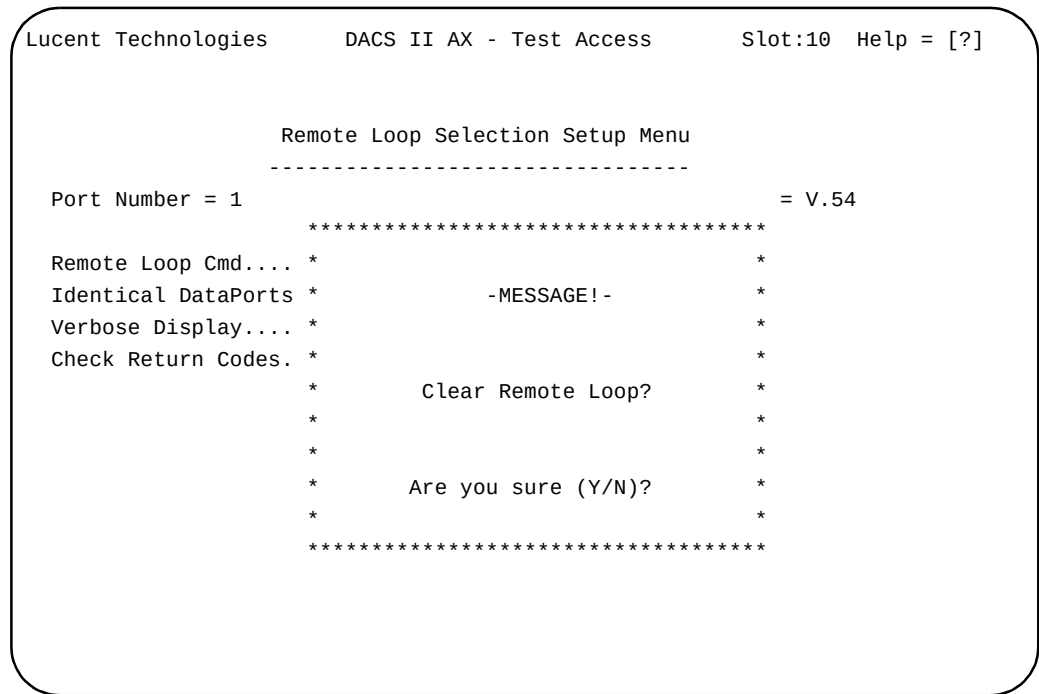


**Figure 16-8. Clear Remote Loop Menu**

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 16-9. 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:

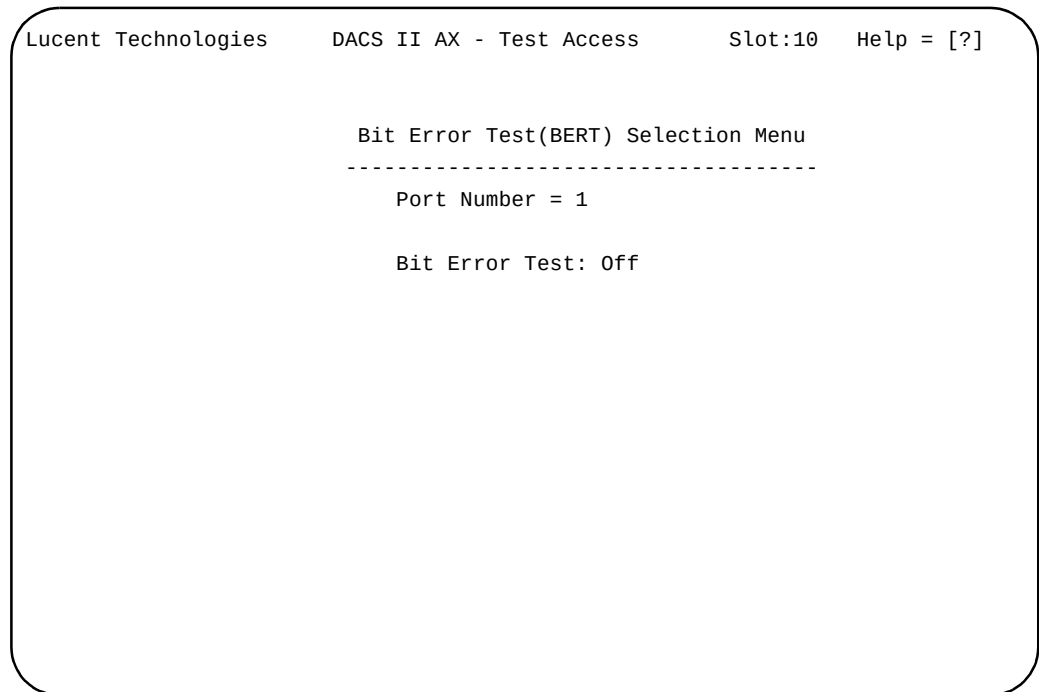
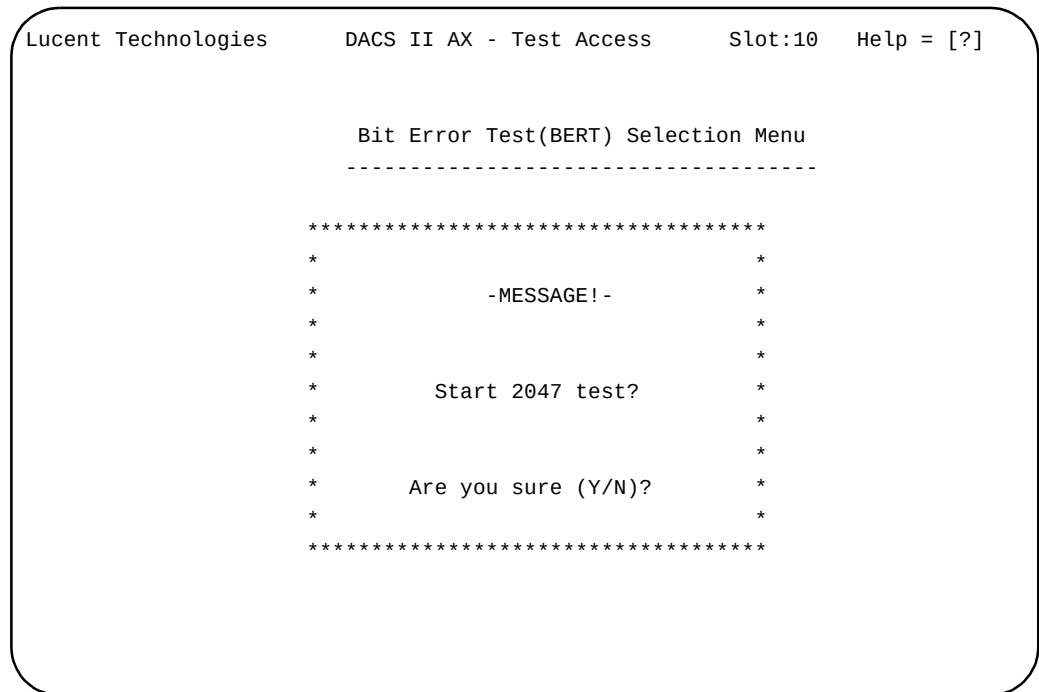


**Figure 16-10. Bit Error Test (BERT) Selection Menu**

2. Toggle through the BERT options by pressing the **<Enter>** key to move forward or the **<b>** 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 16-11. 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.

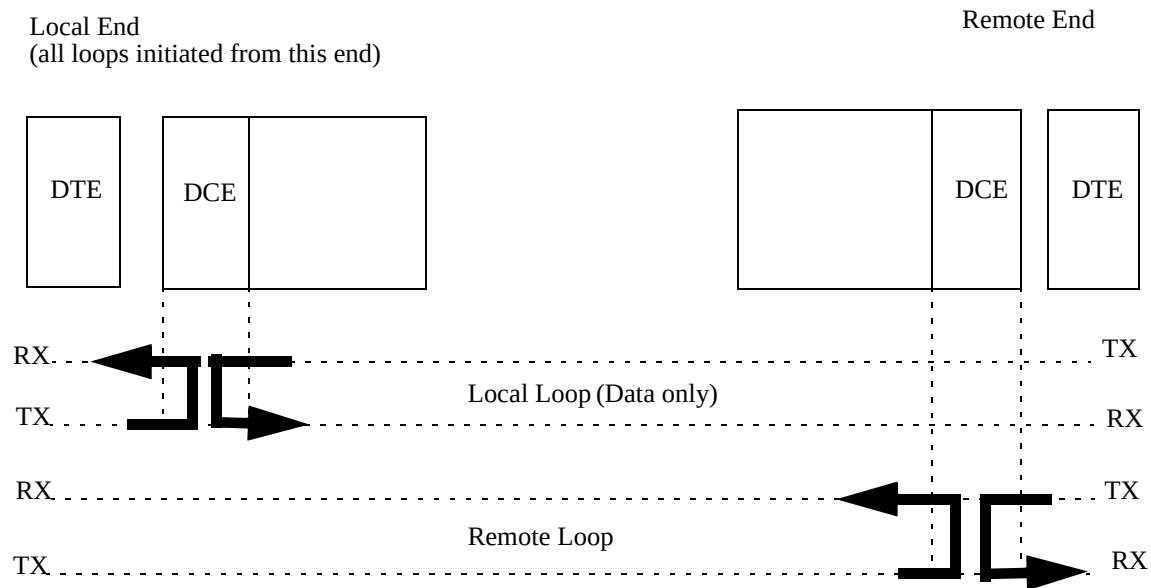


**Figure 16-12. Test Access Loops**

**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

---

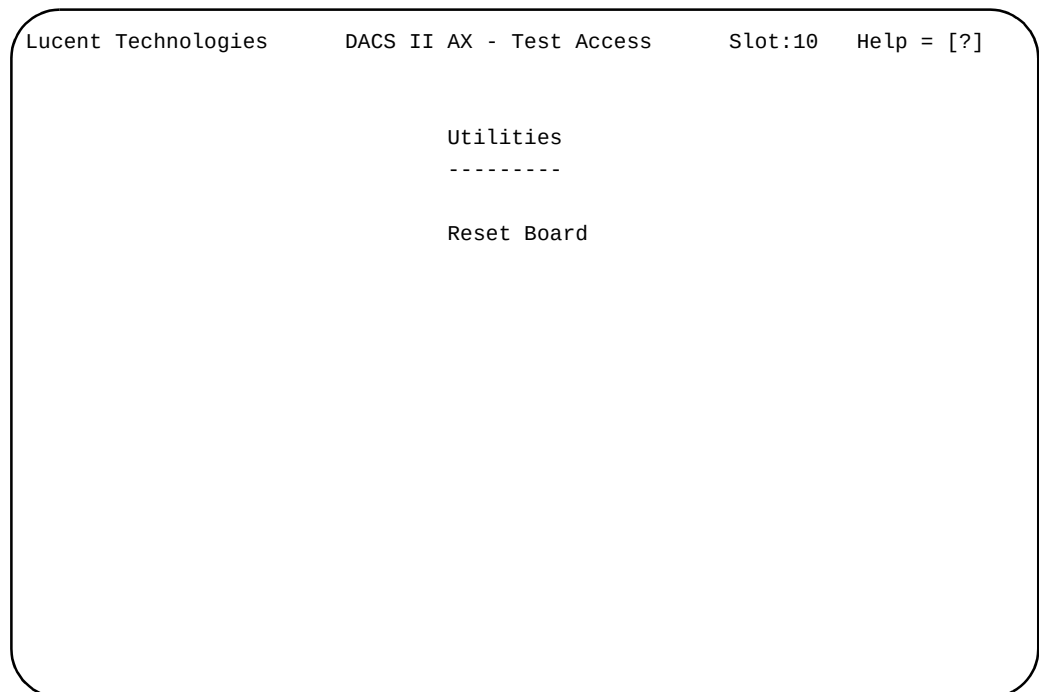
The Utilities Menu provides access to a submenu from which you can reset the TAM card.

---

### 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 16-13. 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:

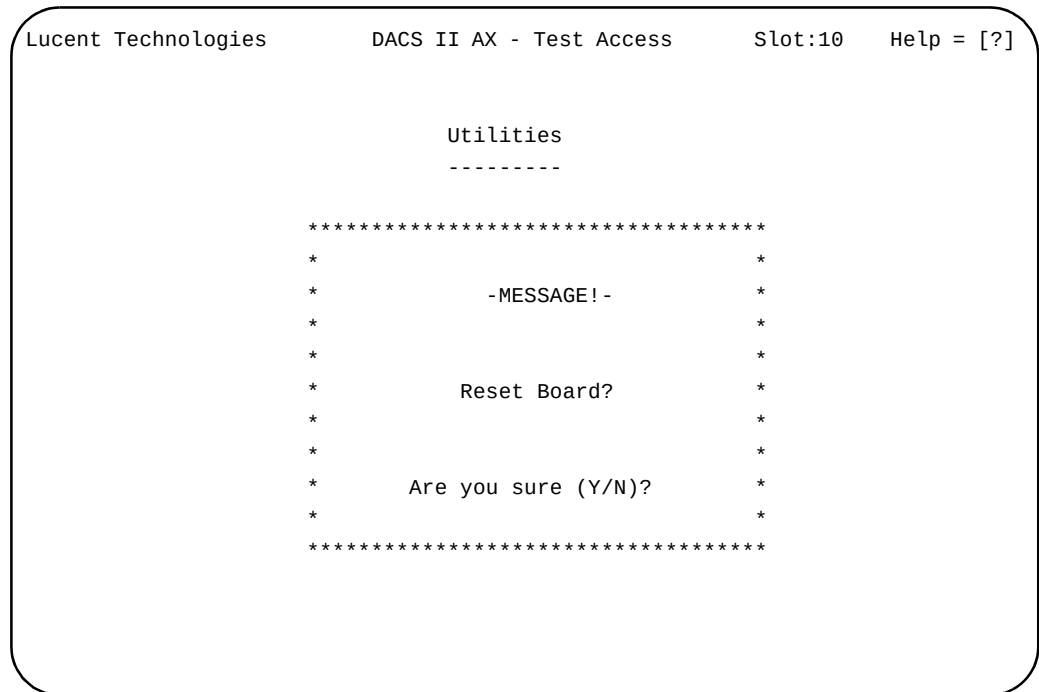


**Figure 16-14. Reset Board Screen**

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

---

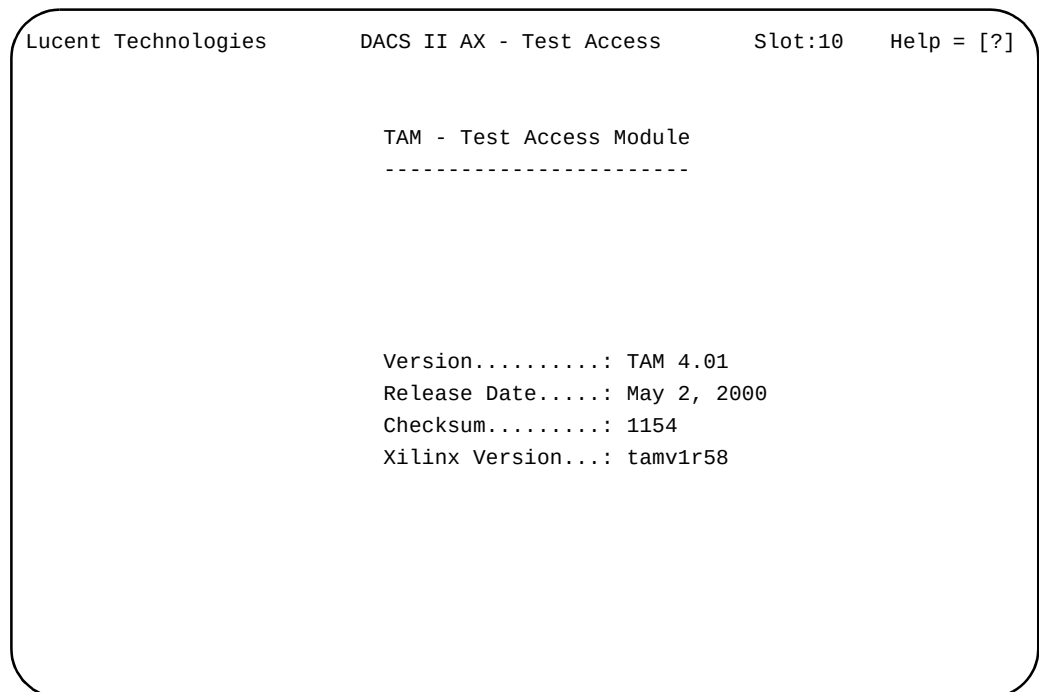
The About Menu displays information about the software release and version, and details about the interface module.

---

### 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 separator. Below the separator, the following information is listed: '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 16-15. 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.

---

---

**Contents**

---

|                                         |                              |
|-----------------------------------------|------------------------------|
| ■ Physical Description                  | <a href="#"><u>17-5</u></a>  |
| ■ Regulatory Information                | <a href="#"><u>17-6</u></a>  |
| North America                           | <a href="#"><u>17-6</u></a>  |
| FCC Customer Information                | <a href="#"><u>17-6</u></a>  |
| Industry Canada Statement               | <a href="#"><u>17-7</u></a>  |
| ■ Product Safety                        | <a href="#"><u>17-9</u></a>  |
| Europe                                  | <a href="#"><u>17-9</u></a>  |
| ■ Before You Begin                      | <a href="#"><u>17-10</u></a> |
| Notes about the Octal T1/E1 Module      | <a href="#"><u>17-10</u></a> |
| ■ Cable Tie Mounts                      | <a href="#"><u>17-11</u></a> |
| ■ Configure Slot for Octal T1/E1 Module | <a href="#"><u>17-12</u></a> |
| Configure Slot                          | <a href="#"><u>17-12</u></a> |
| ■ Configure T1/E1 Links                 | <a href="#"><u>17-13</u></a> |
| Purpose                                 | <a href="#"><u>17-13</u></a> |
| Procedure                               | <a href="#"><u>17-13</u></a> |
| Link Configuration Field Descriptions   | <a href="#"><u>17-15</u></a> |
| ■ Main Menu                             | <a href="#"><u>17-17</u></a> |
| Access Main Menu                        | <a href="#"><u>17-17</u></a> |
| ■ View Configuration                    | <a href="#"><u>17-18</u></a> |

|                                                    |                       |
|----------------------------------------------------|-----------------------|
| Purpose                                            | <a href="#">17-18</a> |
| Related Task                                       | <a href="#">17-18</a> |
| Procedure                                          | <a href="#">17-18</a> |
| ■ Diagnostics                                      | <a href="#">17-19</a> |
| Overview                                           | <a href="#">17-19</a> |
| Before You Begin                                   | <a href="#">17-19</a> |
| Access Diagnostics Manager                         | <a href="#">17-20</a> |
| Diagnostics Manager Field Descriptions             | <a href="#">17-20</a> |
| Begin Diagnostic Test                              | <a href="#">17-21</a> |
| Display Statistics and Link Status                 | <a href="#">17-21</a> |
| ■ Bit Error Rate Tests (BERT)                      | <a href="#">17-22</a> |
| Procedure                                          | <a href="#">17-22</a> |
| Stop BERT Test                                     | <a href="#">17-24</a> |
| ■ Diagnostic Loops                                 | <a href="#">17-25</a> |
| Loop Types                                         | <a href="#">17-25</a> |
| Enable a Network Interface Loop                    | <a href="#">17-26</a> |
| Enable Backplane Loop                              | <a href="#">17-27</a> |
| ■ T1/E1 Link Status                                | <a href="#">17-28</a> |
| Purpose                                            | <a href="#">17-28</a> |
| Procedure                                          | <a href="#">17-28</a> |
| T1/E1 Link Status Field Descriptions               | <a href="#">17-29</a> |
| ■ ESF Statistics                                   | <a href="#">17-31</a> |
| Display ESF Statistics                             | <a href="#">17-31</a> |
| ESF Statistics Field Descriptions                  | <a href="#">17-32</a> |
| ■ Display 15-Minute Performance Registers          | <a href="#">17-33</a> |
| Purpose                                            | <a href="#">17-33</a> |
| Related Information                                | <a href="#">17-33</a> |
| Procedure                                          | <a href="#">17-33</a> |
| 15-Minute Performance Registers Field Descriptions | <a href="#">17-34</a> |
| ■ Display or Clear G.826 Statistics                | <a href="#">17-35</a> |
| Purpose                                            | <a href="#">17-35</a> |
| Related Information                                | <a href="#">17-35</a> |
| Procedure                                          | <a href="#">17-35</a> |
| G.826 Statistics Field Descriptions                | <a href="#">17-36</a> |
| ■ Re-initialize Framers                            | <a href="#">17-37</a> |
| Purpose                                            | <a href="#">17-37</a> |

|                                                       |                              |
|-------------------------------------------------------|------------------------------|
| Procedure                                             | <a href="#"><u>17-37</u></a> |
| ■ Insert Errors                                       | <a href="#"><u>17-38</u></a> |
| Purpose                                               | <a href="#"><u>17-38</u></a> |
| Procedure                                             | <a href="#"><u>17-38</u></a> |
| ■ Monitor Control Signals                             | <a href="#"><u>17-39</u></a> |
| Purpose                                               | <a href="#"><u>17-39</u></a> |
| Procedure                                             | <a href="#"><u>17-39</u></a> |
| PCM Signalling Status Display Menu Field Descriptions | <a href="#"><u>17-40</u></a> |
| ■ Utilities Menu                                      | <a href="#"><u>17-42</u></a> |
| Access Utilities                                      | <a href="#"><u>17-42</u></a> |
| Resetting the Octal T1/E1 Module                      | <a href="#"><u>17-43</u></a> |
| Cold Reset                                            | <a href="#"><u>17-43</u></a> |
| Warm Reset                                            | <a href="#"><u>17-43</u></a> |
| Put Module In-Service or Out of Service               | <a href="#"><u>17-44</u></a> |
| ■ N+1 Redundancy Menu                                 | <a href="#"><u>17-46</u></a> |
| Display Redundancy Information                        | <a href="#"><u>17-46</u></a> |
| N+1 Redundancy Status Field Descriptions              | <a href="#"><u>17-47</u></a> |
| ■ About Menu                                          | <a href="#"><u>17-48</u></a> |
| Display Module Information                            | <a href="#"><u>17-48</u></a> |
| About Field Descriptions                              | <a href="#"><u>17-49</u></a> |

---



## Physical Description

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.
- N+1 Redundancy is available when the Octal T1/E1 module is installed in a DACS II AX-11 chassis with the N+1 Protection Switch.

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.

- **STATUS** - 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. In previous versions, this LED is labeled **SYNC/ALM**.
- **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.

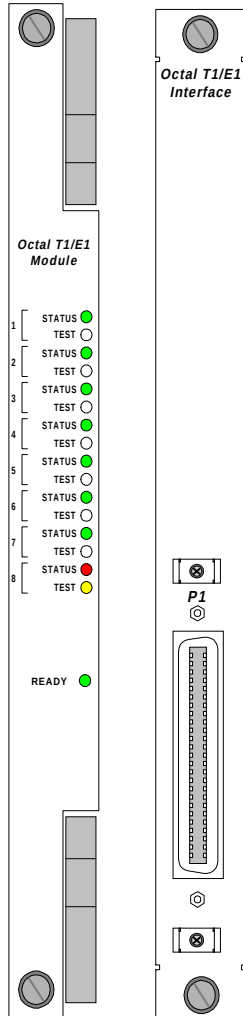


**Figure 17-1. Octal T1/E1 Application/Interface Module Set**

## **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.



|                           |                                                                                                                                                                      |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type of Interface</b>  | 1.544 Mbps Digital Channel                                                                                                                                           |
| <b>Facility Interface</b> | 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                                                                                                                |
| <b>Service Code</b>       | 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. |
| <b>Jack Arrangement</b>   | RJ48M                                                                                                                                                                |
| <b>Ringer Equivalence</b> | 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**

---

### **Notes about the Octal T1/E1 Module**

- A slot must be configured for Octal T1/E1.
  - The Octal T1/E1 application module and rear interface must be physically present in the DACS II AX chassis.
  - For cabling and interface requirements, refer to 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.

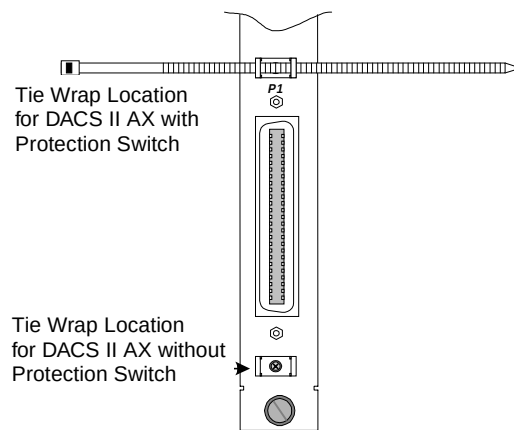


**Figure 17-2. Tie-Wrap Attachment Locations**

## **Configure Slot for Octal T1/E1 Module**

### **Configure Slot**

Configure a slot for the Octal T1/E1 module. Refer to [Configuring a Slot: page 4-8](#).

---

## Configure T1/E1 Links

**Purpose** There are eight links on an Octal T1/E1 module. Each link that will be used can be configured for T1 or E1 operation.

**Procedure** To configure the T1/E1 Links:

1. From the *DACS II AX Main Menu*, select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.**

You must use the **P** key to configure the module. If you go through the module's Main Menu, you will access view-only configuration screens.  
The Links Configuration Menu displays.

|                     |                |                               |       |                          |              |            |           |
|---------------------|----------------|-------------------------------|-------|--------------------------|--------------|------------|-----------|
| Lucent Technologies |                | DACS II AX - System Manager   |       |                          |              | Help = [?] |           |
|                     |                | Slot #10                      |       | Links Configuration      |              |            |           |
|                     |                | -----                         |       |                          |              |            |           |
|                     | Link Name      | Framing                       | FDL   | LH/LBO                   | Network Loop | Yel Alarm  | Idle Code |
| --                  |                | -----                         |       |                          |              |            |           |
| 01                  | Circuit Number | T1 ESF B8ZS                   | 54016 | 0.0db                    | Disable      | No         | Busy      |
| 02                  | Circuit Number | T1 ESF B8ZS                   | 54016 | 0.0db                    | Disable      | No         | Busy      |
| 03                  | Circuit Number | T1 ESF B8ZS Framed            | 54016 | 0.0db                    | Disable      | No         | Busy      |
| 04                  | Circuit Number | T1 ESF B8ZS Framed            | 54016 | 0.0db                    | Disable      | No         | Busy      |
| 05                  | Circuit Number | E1-CAS                        |       | S-Haul                   | Disable      | No         | Busy      |
| 06                  | Circuit Number | E1-CAS                        |       | S-Haul                   | Disable      | No         | Busy      |
| 07                  | Circuit Number | E1                            |       | S-Haul                   | Disable      | No         | Busy      |
| 08                  | Circuit Number | E1                            |       | S-Haul                   | Disable      | No         | Busy      |
|                     |                |                               |       |                          |              |            |           |
| LH - long haul      |                | LBO - line build out[T1 only] |       | FDL - facility data link |              |            |           |

**Figure 17-3. Links Configuration Menu**

2. 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 - System Manager      Help = [?]

Slot #10   Link Configuration  
-----

Link Nbr.....: 3  
Name.....: Circuit Number  
Status.....: In Service  
Recover Time..: 3 seconds  
Clear T1/E1...: Framed  
LineType.....: T1 ESF B8ZS  
Network Loop..: Disabled  
Yellow alarm..: No  
Unused DS0's..: Busy  
ESF format....: 54016  
LBO.....: 0.0db <> Long Haul

---

**Figure 17-4. Link Configuration Entry Submenu**

3. Configure the links. Refer to [Link Configuration Field Descriptions: page 17-15](#).
  4. Press **X** to save changes.  
The following message appears:  
*Update configuration?Are you sure (Y/N)?*
  5. Press **Y(es)** to save your changes or press **N(o)** to cancel the changes.
  6. Configure another link, or when all links are configured, press **X** to return to the previous menu.
-



## Link Configuration Field Descriptions

The following fields appear on the Octal T1/E1 Link Configuration menu ([Figure 17-3](#)).

**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. 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.

**Line Type:** (*option field*) This field determines the type of framing used on the line.

| If Clear T1/E1 field is set to | Then Available Line Types are:                                                                                                                                                                         |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Framed                         | E1, E1-CRC, E1-CAS, E1-CAS-CRC<br>T1-EST B8ZS, T1-ESF AMI 62411, T1 D4 B8ZS,<br>T1 D4 AMI 62411                                                                                                        |
| Unframed                       | T1 AMI, T1 B8ZS, E1                                                                                                                                                                                    |
| Disabled                       | E1, E1-CRC, E1-CAS, E1-CAS-CRC<br>T1-EST B8ZS, T1-ESF AMI 62411, T1 D4 B8ZS,<br>T1 D4 AMI 62411<br>T1 ESF AMI Clear*, T1 D4 AMI Clear*<br><br>*Clear refers to clear channel mode at 64k per time slot |

**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.

Long Haul/Short Haul designations are for E1 lines only. They 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
-

## Main Menu

**Access Main Menu** To access the Main Menu for the Octal T1/E1 module:

1. From the *DACS II AX Main Menu*, select *Node Summary*.
2. 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 for the Octal T1/E1 slot 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.

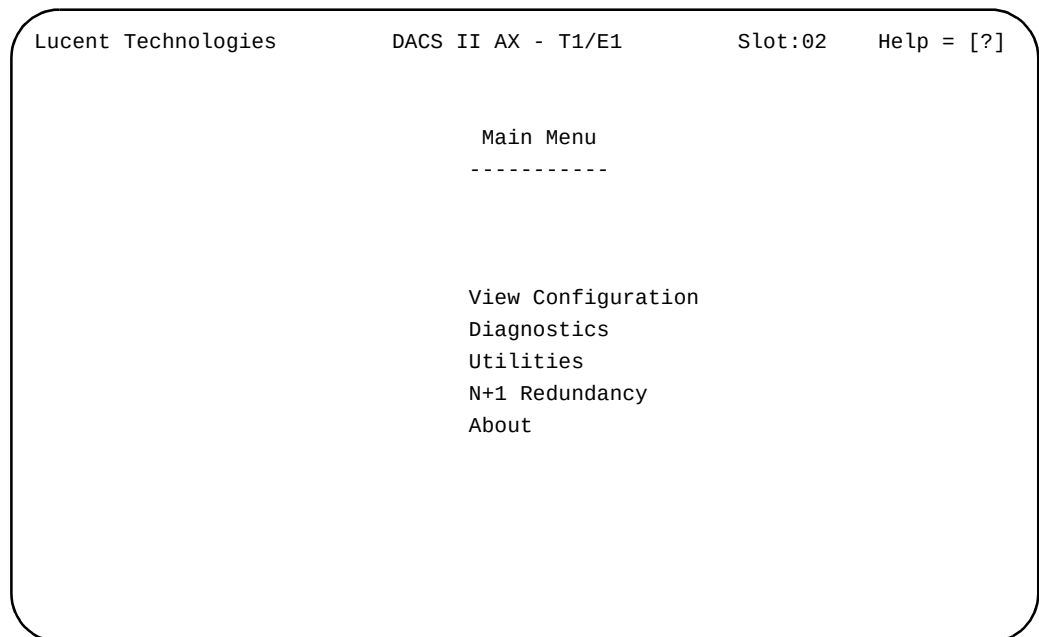


**Figure 17-5. Octal T1/E1 Main Menu**

From the Octal T1/E1 *Main Menu* you can display the port/link configuration for 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.

## View Configuration

---

- Purpose** The View Configuration option available from the module's main menu enables you to display the configuration for the eight T1/E1 links on the Octal T1/E1 module.
- Related Task** To change the link configuration, refer to [Configure T1/E1 Links: page 17-13](#).
- Procedure** To display a module's port and link configuration.
1. From the *Main Menu*, select *View Configuration*.
  2. To view parameters for an individual link, move your cursor to a link number field and press **<Enter>**.  
  
From here, you can view the configuration of a link. Refer to [Link Configuration Field Descriptions: page 17-15](#) for an explanation of the fields in this menu.
  3. Press **X** to exit.
-

## Diagnostics

---

### Overview

The Diagnostics Menu provides access to loopbacks and built-in BERTs. It also provides access which display link statistics.

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 17-9](#). 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.

---

### Before You Begin

A module must be In Service to access the Diagnostics Menu. For further information, see [Put Module In-Service or Out of Service: page 17-44](#).

A diagnostic loop should be enabled before turning on a BERT pattern.

**Access Diagnostics Manager** From the *Main Menu*, select *Diagnostics*, then select *Line Diagnostics Center*.  
 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 15-min Performance [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 17-6. Diagnostics Manager Submenu**

## Diagnostics Manager Field Descriptions

The following fields appear on the Diagnostics Manager menu ([Figure 17-6](#)).

**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 command 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.
- 

### **Display Statistics and Link Status**

To display Statistics and Link Status:

The following command 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] = 15-Minute Performance Registers:** The 15-Minute Performance 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.
-

## 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):

1. 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 17-7. Diagnostics BERT Select Submenu**





**NOTE:**

Diagnostic Loops should be enabled before enabling BERT.

2. 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 2<sup>15</sup> (Inverted Pattern according to ITU 0.151)
- **[4]** Unframed 2<sup>20</sup>
- **[5]** Unframed 2<sup>23</sup> (Inverted Pattern according to ITU 0.151)
- **[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
- **[0]** All-zeros (0x00)
- **[B]** Framed 2047
- **[C]** Framed 2<sup>15</sup> (Inverted Pattern according to ITU 0.151)
- **[D]** Framed 2<sup>20</sup>
- **[E]** Framed 2<sup>23</sup> (Inverted Pattern according to ITU 0.151)
- **[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

3. 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 17-8. Start New Test Screen**

4. 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

### Loop Types

Each T1/E1 link can be independently looped back. Loops are enabled from the *Loop Select* submenu. Diagnostic loops are shown in [Figure 17-9](#).

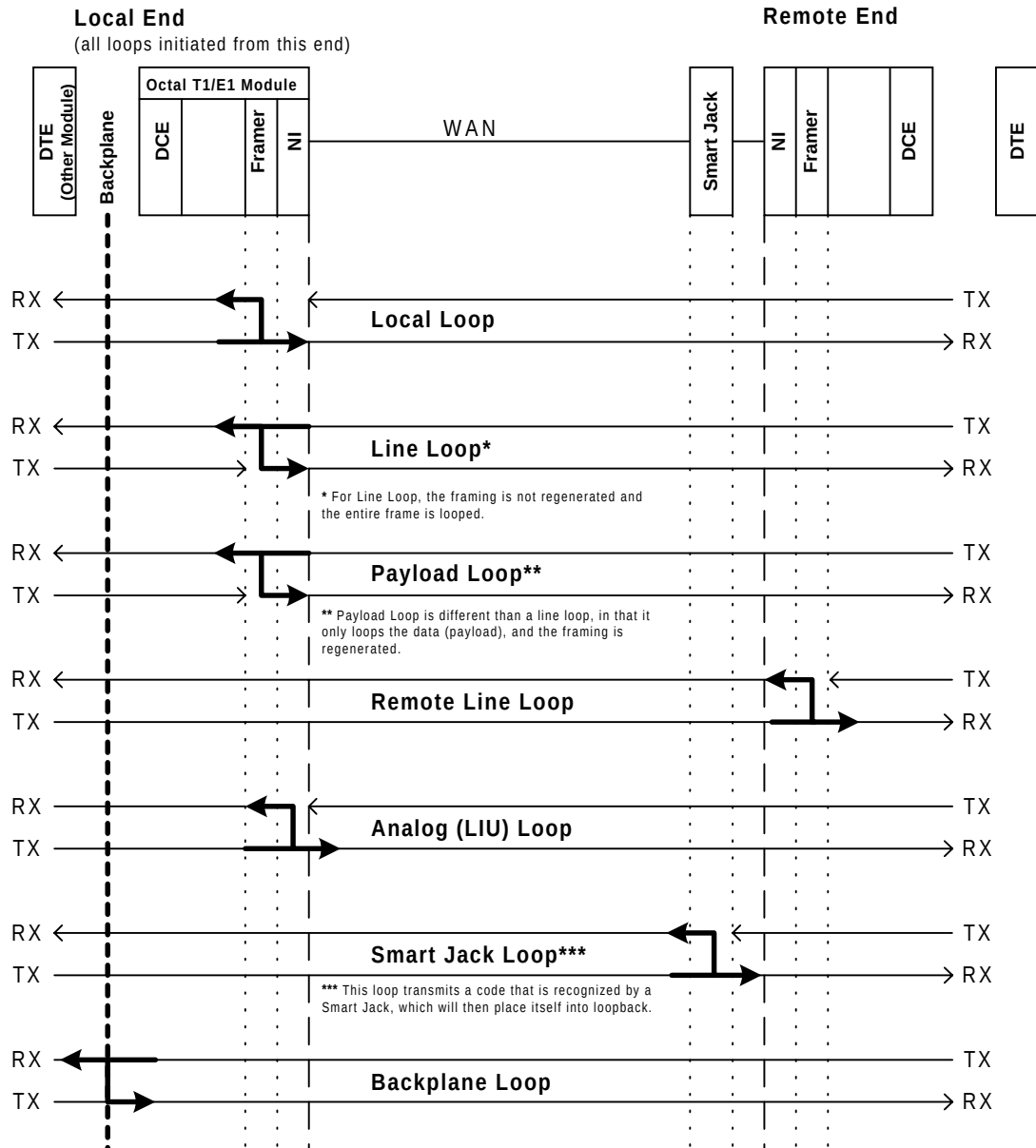


Figure 17-9. Octal T1/E1 Diagnostic Loops

## Enable a Network Interface Loop

To enable a Network Interface Loop:

1. From the *Diagnostics Manager* submenu, place your cursor on an active link and press L. The following submenu appears:

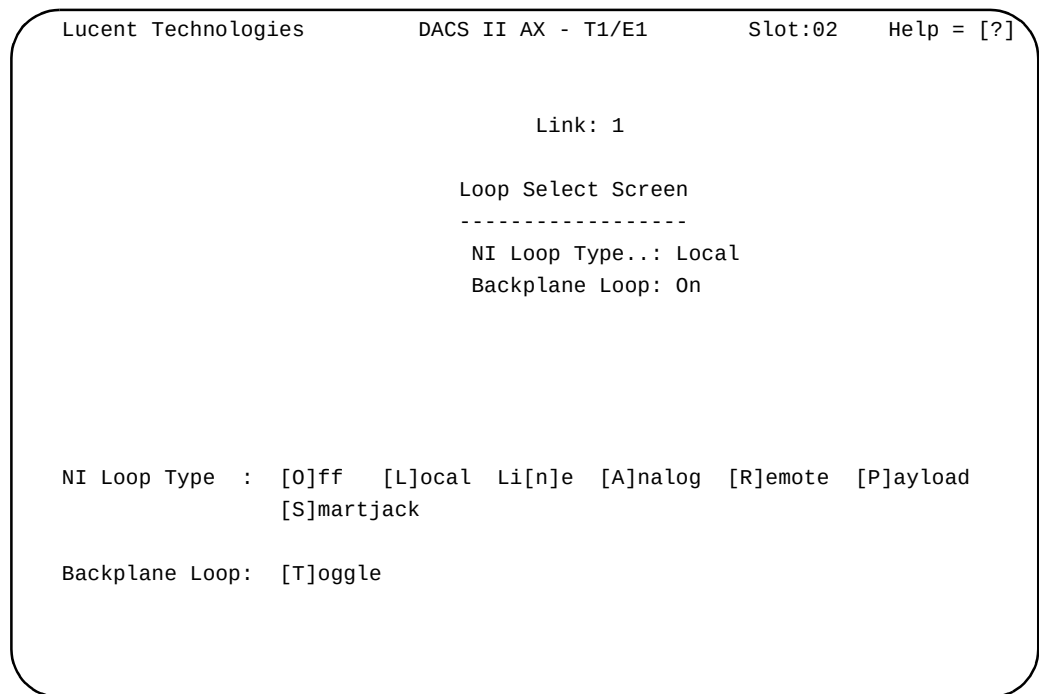


**Figure 17-10. Loop Select Submenu**

2. 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 command key indicated on the bottom of the menu. The NI Loop command 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 (**for T1 only**)
  - **[P]** - for a payload loop
  - **[S]** - for a SmartJack loop (**for T1 only**)

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 17-9](#).

## **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

**Purpose** The Expose screen displays the real-time or current status of the T1/E1 link.

**Procedure** To access the Expose Screen and view the status of the T1/E1 Link:

1. 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:02
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     Re[i]nitialize  
 ESF [S]tatistics     15-min Performance [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. 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, under Errored Seconds.

**T1/E1 Link Status  
Field Descriptions**

**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 T1/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 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 and in Clear T1/E1 Framed mode, except for LOS and BPV.

**ErrSecs (Errored Seconds):** The display count indicates the quantity of seconds that the error condition on the T1/E1 link has been present or was present. Press **C** to clear the counters for this link.

**Red Alarm:** This field will display *On* if a loss of frame alignment has occurred and synchronization has been lost.

**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).

**Loss of Signal:** This field will display *On* to indicate a loss of signal detection. No T1 or E1 signal is present on the RX pair to the DACS II AX.

**AIS Indication (Alarm Indication Signal Indication):** This field will display *On* if an unframed "all ones" condition has been detected.

**Out of Frame:** This field will display *On* to indicate that the received link data stream does not meet pre-set framing criteria.

**SEF Indication (Severely Errored Frame Indication):** This field will display *On* if the receive signal does not meet the requirements of ANSI T1.231.

**Transmit Slip:** This field will display *On* to indicate that slip has been detected in the transmit path.

**Receive Slip:** This field will display *On* to indicate that slip has been detected in the receive path.

**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.

**Frame 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.

---



## 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.

ESF statistics can not be displayed for a D4-framed link.

### Display ESF Statistics

To display ESF Statistics, you can either:

- Place your cursor on any active link in the *Diagnostics Manager* submenu and press **S**.
- From the T1/E1 Link Status screen, press **S**.

The following screen appears:

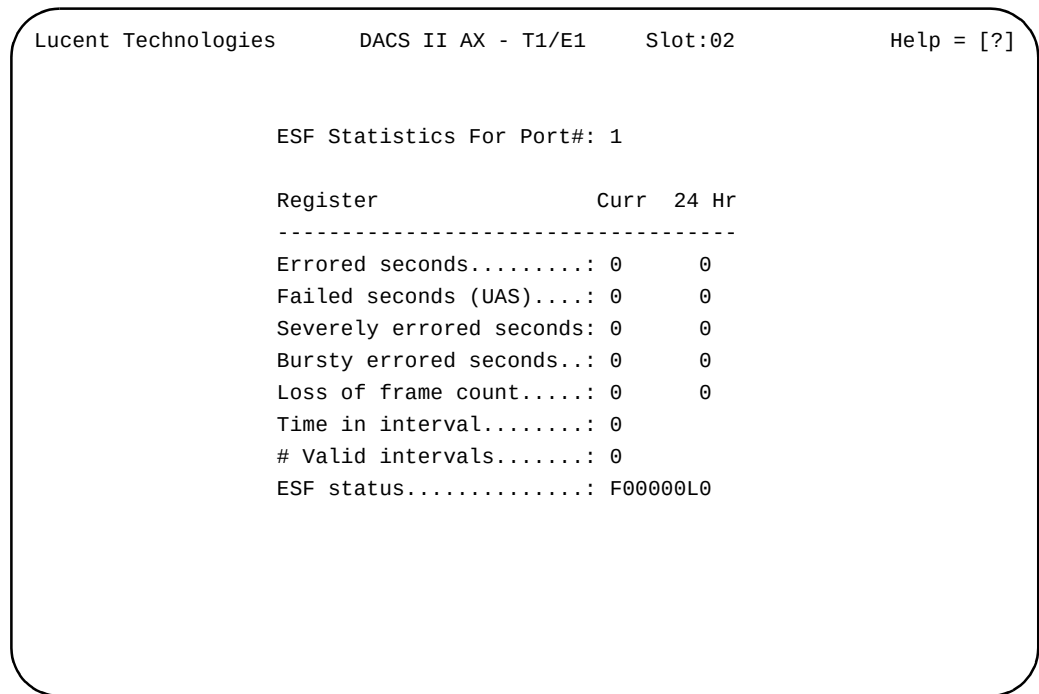


**Figure 17-12. ESF Statistics Display**

## ESF Statistics Field Descriptions

These fields appear on the ESF Statistics menu ([Figure 17-12](#)).

**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:

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 15-Minute Performance Registers

**Purpose** The *15-Minute Performance 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.

**Related Information** The information has no meaning in Clear T1/E1 Unframed mode. Additionally, 15-minute performance registers are not accessible for a D4-framed link.

**Procedure**

- To display the 15-minute performance registers, you can either:
  - Place your cursor on any active link in the *Diagnostics Manager* submenu and press **R**.
  - From the T1/E1 Link Status screen, press **R**.

The *15-Minute Performance Registers* display for the selected link appears.

|                                           |     |     |     |     |                    |     |     |     |     |         |     |     |            |     |
|-------------------------------------------|-----|-----|-----|-----|--------------------|-----|-----|-----|-----|---------|-----|-----|------------|-----|
| Lucent Technologies                       |     |     |     |     | DACS II AX - T1/E1 |     |     |     |     | Slot:02 |     |     | Help = [?] |     |
| 15-min Performance Registers For Port#: 3 |     |     |     |     |                    |     |     |     |     |         |     |     |            |     |
| 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 |

**Figure 17-13. 15-Minute Performance Registers Display**

2. Press **N** to view the next 48 intervals. The information contained in each field on the screen is detailed on the following page.

**15-Minute  
Performance  
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 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.

## Display or Clear G.826 Statistics

**Purpose** 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.

**Related Information** The G.826 Statistics Display is not accessible for E1 links without CRC or T1 links with D4 framing.

**Procedure** To access the G.826 Statistics screen:

1. Place your cursor on any *Active* link in the *Diagnostics Manager* submenu and press **G**. The *G.826 Statistics Display* appears.

```
Lucent Technologies DACS II AX - T1/E1 Slot:02 Help = [?]

 G.826 Statistics

Link#: 1
Total Time.....: 9551
Errored Seconds.....: 0
Error Free Seconds.....: 9551
Severely Errored Seconds.....: 0
Consecutive Severely Errored Seconds: 0
Consecutive Error Free Seconds.....: 9551
Background Block Error.....: 0
Errored Seconds Ratio.....: 0.00 %
Severely Errored Seconds Ratio.....: 0.00 %
Background Block Error Ratio.....: 0.00 %

[C]lear Counters
```

**Figure 17-14. G.826 Statistics Display**

2. To clear all counters, press **C**.

**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.

**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 Block Error:** An errored block not occurring as part of a severely errored second. This field displays the number of background block errors 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 Block Error 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 Framers

---

### Purpose

The re-initialize function is used to reset the framers to their default values. It will only reset the framers, not the entire module.



### CAUTION:

*Re-initializing the framers will cause data to be momentarily interrupted.*

### Procedure

To re-initialize the framers:

1. Place the cursor on a link in the Diagnostics Manager submenu and press **E**.
  2. From the *T1/E1 Link Status* submenu, press **I**, and the framers re-initialize. The *T1/E1 Link Status* submenu continues to be displayed.
-

## Insert Errors

---

**Purpose** 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:

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 command 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

**Purpose** The Monitor Control Signals option is used to observe the status of Pulse Coded Modulation (PCM) signalling for the Octal T1/E1 Module's configured links.

**Procedure** To monitor control signals:

1. From the *Diagnostics Menu*, select *Monitor Control Signals*. The *PCM Signalling Display Menu* appears.

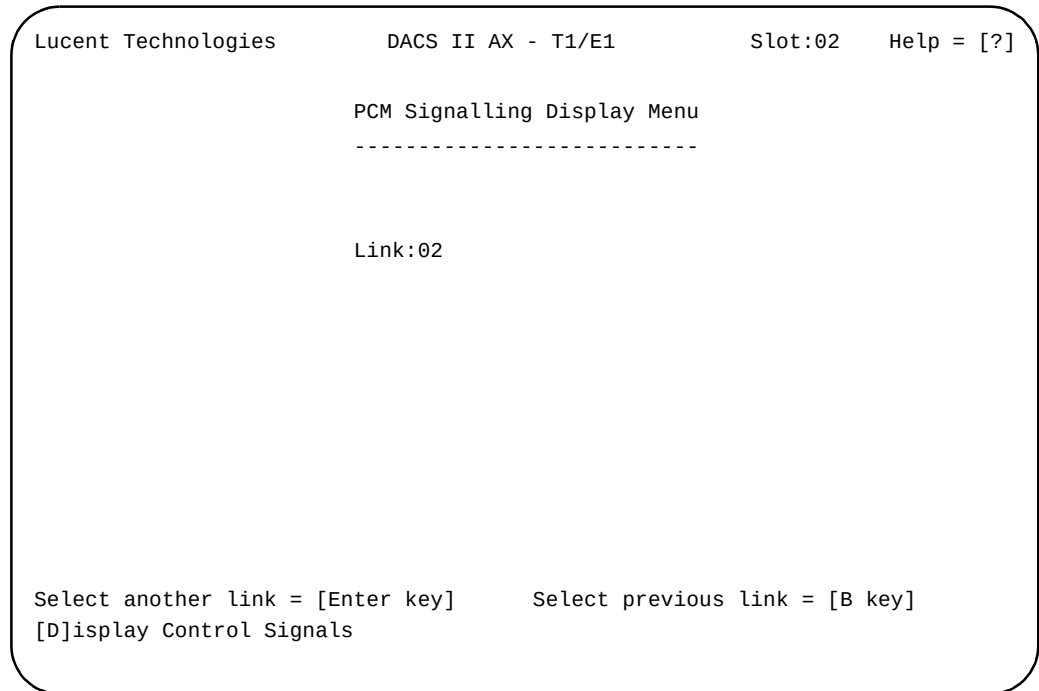


**Figure 17-15. PCM Signalling Display Menu**

2. Press **<Enter>** to toggle to the link number you want to view.
3. Press **D** and the following menu appears displaying the selected link:

Lucent Technologies

DACS II AX - T1/E1

Slot:02

Help = [?]

Link:2

PCM Signalling Display Menu

| Chls  | To Link | To Bus | Chls | To Link | To Bus |
|-------|---------|--------|------|---------|--------|
| ----- |         |        |      |         |        |
| FRAME |         |        |      |         |        |
| 01    | A_C_    | A_C_   | 16   | A_C_    | A_C_   |
| 02    | A_CD    | A_CD   | 17   | A_CD    | A_CD   |
| 03    | AB__    | AB__   | 18   | AB__    | AB__   |
| 04    | AB_D    | AB_D   | 19   | AB_D    | AB_D   |
| 05    | ABC_    | ABC_   | 20   | Data    | Data   |
| 06    | ABCD    | ABCD   | 21   | Data    | Data   |
| 07    | __D     | __D    | 22   | N/A     | N/A    |
| 08    | __C_    | __C_   | 23   | N/A     | N/A    |
| 09    | _CD_    | _CD_   | 24   | N/A     | N/A    |
| 10    | _B__    | _B__   | 25   | N/A     | N/A    |
| 11    | _B_D    | _B_D   | 26   | N/A     | N/A    |
| 12    | _BC_    | _BC_   | 27   | N/A     | N/A    |
| 13    | ABC_    | ABC_   | 28   | N/A     | N/A    |
| 14    | A___    | A___   | 29   | N/A     | N/A    |
| 15    | A__D    | A__D   | 30   | N/A     | N/A    |
| CAS   |         |        |      |         |        |

**Figure 17-16. PCM Signalling Status Display**

The *PCM Signalling Status Display* is a read-only screen which displays the control signals for a selected link. This screen will vary slightly depending upon which type of link is being viewed (T1 or E1). Descriptions of each field on this screen are supplied on the following page.

#### PCM Signalling Status Display Menu Field Descriptions

**Link:** Displays the link number for which the control signals are shown.

**DS0:** (T1 link) Displays the time slot (DS0) for which the control signals are being reported.

**Chls:** (E1 Link) Displays the channel 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. N/A indicates that the DS0 has not been mapped, or that it is a signaling or framing channel such as E1 CAS. 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:** This field displays the control signals (A, B, C, or D) that are being sent towards the DACS II AX Backplane. *N/A* indicates that the DS0 has not been mapped, or that it is a signaling or framing channel such as E1 CAS. *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

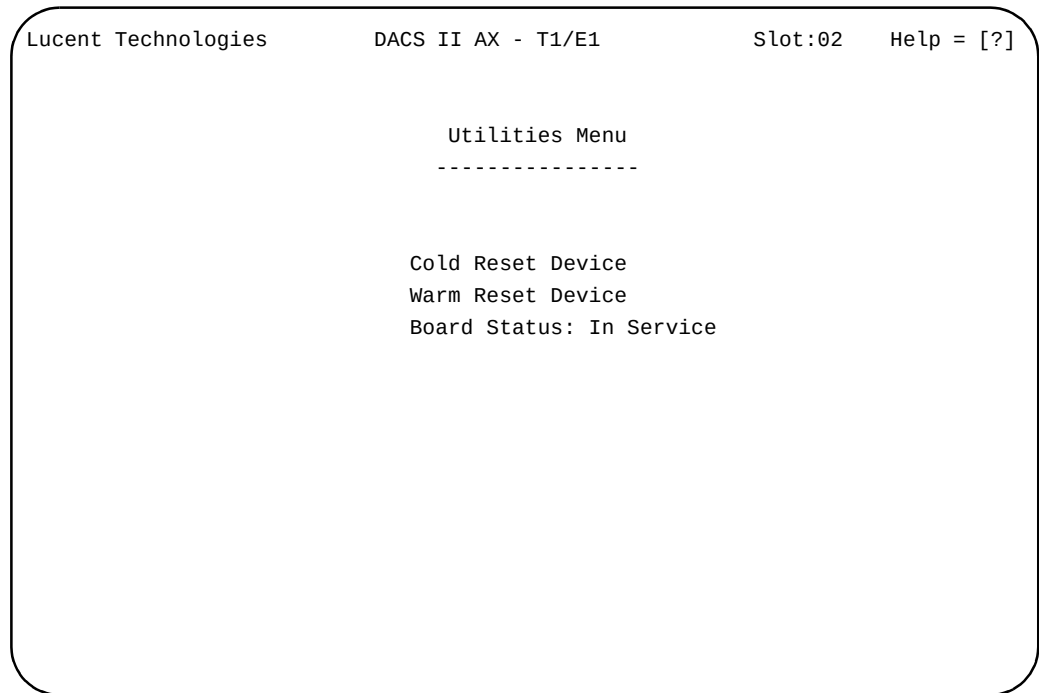
---

The Utilities Menu provides options for resetting the Octal T1/E1 module and for changing the board status.

### Access Utilities

To access the Utilities Menu:

From the *Main Menu*, select *Utilities*. The following menu appears:



---

**Figure 17-17. Utilities Menu**

---

## Resetting the Octal T1/E1 Module

Resetting the Octal T1/E1 module causes the 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.



### **WARNING:**

*Resetting the module will cause data to be momentarily interrupted.*

There are two options for resetting the Octal T1/E1 module:

- Cold Reset - takes approximately 30 seconds. A cold reset can be initiated by the user from the Utilities menu. A cold reset also automatically takes place when the module is powered up, and when the module resets due to a system fault.
- Warm Reset - takes approximately 15 seconds. A warm reset can be initiated by the user from the Utilities menu. A warm reset also automatically takes place when software is downloaded to an Octal T1/E1 application module. A warm reset minimizes the time that an Octal T1/E1 module is out of service during program download.

## Cold Reset

To perform a Cold Reset on the Octal T1/E1 Module:

1. From the *Utilities Menu*, select *Cold Reset Device*.

The following message appears: *Reset Device? Are you sure (Y/N)?*

2. Press **Y** to reset the board, and wait approximately 30 seconds for the card to reset.

You are returned to the *Node Summary Menu*. 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 during a Cold Reset. Wait for the Device State on the menu to display "On-line" before you attempt to access the module.

---

## Warm Reset

To perform a Warm Reset on the Octal T1/E1 Module:

1. From the *Utilities Menu*, select *Warm Reset Device*.

The following message appears: *Reset Device? Are you sure (Y/N)?*

2. Press **Y** to reset the board, and wait approximately 15 seconds for the card to reset.

You are returned to the *Node Summary Menu*. The Octal T1/E1 Module's Device State will display *On-line*. Wait for the Device State on the menu to display "On-line" before you attempt to access the module.

## Put Module 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:

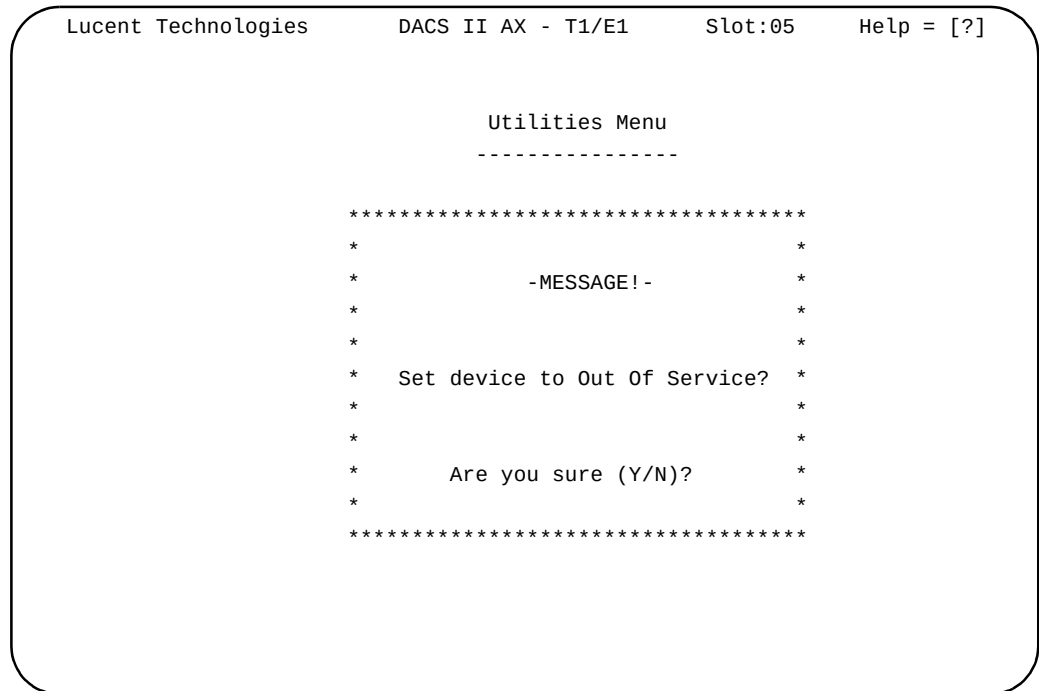


**Figure 17-18. Board Status Out Of Service Screen**

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:

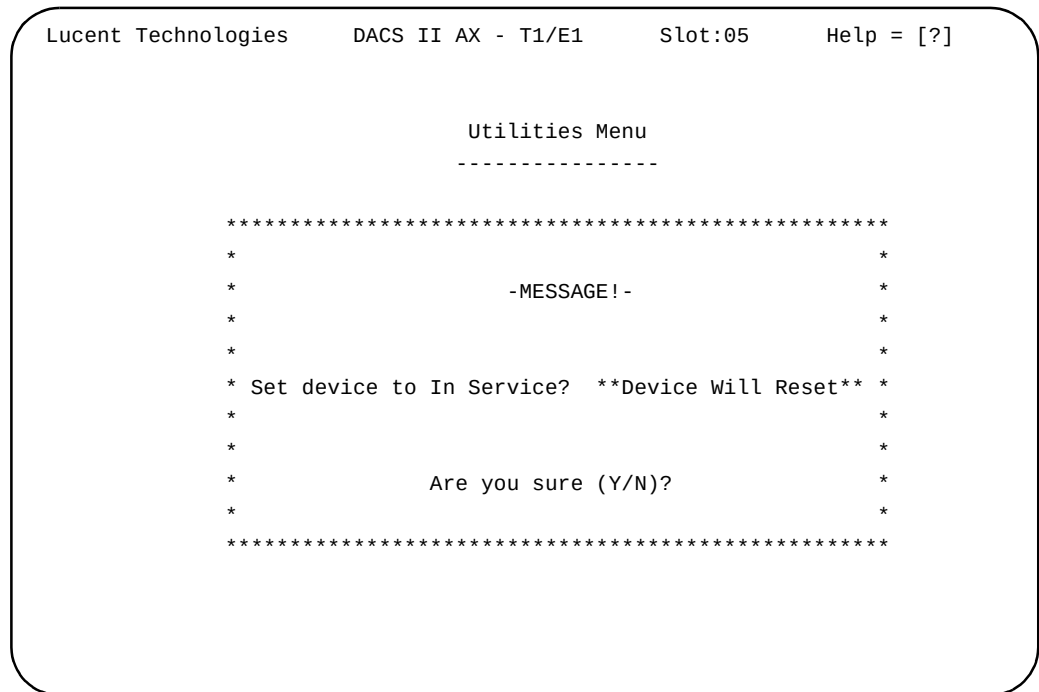


**Figure 17-19. Reset In Service Screen**

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*, select *N+1 Redundancy*, then select *Device Redundancy*. 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 17-20. 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 17-20](#)).

**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.....: 4.0
 Release Date....: January 12, 2001
 Checksum.....: 5AE6
 Xilinx Version...: t1e1_rev6
 Front Card Type..: Octal T1/E1
 Front Card Rev...: 0
 Rear Card Type...: Octal T1E1 120 OHM
 Rear Card Rev....: 1
```

---

**Figure 17-21. About Display**

## About Field Descriptions

The following fields appear on the Octal T1/E1 module About menu ([Figure 17-21](#)).

**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.

---



## **Contents**

---

|                                                   |                              |
|---------------------------------------------------|------------------------------|
| ■ Regulatory Information                          | <a href="#"><u>18-3</u></a>  |
| North America                                     | <a href="#"><u>18-3</u></a>  |
| Product Safety                                    | <a href="#"><u>18-3</u></a>  |
| Europe                                            | <a href="#"><u>18-3</u></a>  |
| ■ Physical Description                            | <a href="#"><u>18-4</u></a>  |
| Octal Voice Interface Modules                     | <a href="#"><u>18-6</u></a>  |
| E&M Interface Module                              | <a href="#"><u>18-7</u></a>  |
| ■ Before You Begin                                | <a href="#"><u>18-11</u></a> |
| ■ Configuring A Slot for the Octal Voice Module   | <a href="#"><u>18-12</u></a> |
| Configure Slot                                    | <a href="#"><u>18-12</u></a> |
| ■ Configuring the Octal Voice Module              | <a href="#"><u>18-13</u></a> |
| Procedural Overview                               | <a href="#"><u>18-13</u></a> |
| ■ Access the Octal Voice Card Configuration Menu  | <a href="#"><u>18-14</u></a> |
| Purpose                                           | <a href="#"><u>18-14</u></a> |
| Procedure                                         | <a href="#"><u>18-14</u></a> |
| Octal Voice Card Configuration Field Descriptions | <a href="#"><u>18-15</u></a> |
| ■ Configure for an Interface Module               | <a href="#"><u>18-17</u></a> |
| Before you begin                                  | <a href="#"><u>18-17</u></a> |
| Procedure                                         | <a href="#"><u>18-17</u></a> |

|                                                     |                              |
|-----------------------------------------------------|------------------------------|
| ■ Configure FXO-DPT Parameters                      | <a href="#"><u>18-19</u></a> |
| FXO-DPT Configuration Submenu Field Descriptions    | <a href="#"><u>18-20</u></a> |
| ■ Configure FXS-PLAR Parameters                     | <a href="#"><u>18-21</u></a> |
| FXS - PLAR Configuration Submenu Field Descriptions | <a href="#"><u>18-22</u></a> |
| ■ Configure E&M Parameters                          | <a href="#"><u>18-23</u></a> |
| E&M Configuration Submenu Field Descriptions        | <a href="#"><u>18-24</u></a> |
| ■ Access the Octal Voice Main Menu                  | <a href="#"><u>18-25</u></a> |
| Purpose                                             | <a href="#"><u>18-25</u></a> |
| Procedure                                           | <a href="#"><u>18-25</u></a> |
| ■ Diagnostics Menu                                  | <a href="#"><u>18-26</u></a> |
| Run Diagnostics                                     | <a href="#"><u>18-26</u></a> |
| ■ Set Up Tone Generator Diagnostics                 | <a href="#"><u>18-28</u></a> |
| Diagnostics Field Descriptions                      | <a href="#"><u>18-29</u></a> |
| ■ Utilities Menu                                    | <a href="#"><u>18-32</u></a> |
| Access Utilities                                    | <a href="#"><u>18-32</u></a> |
| Display Voice Signaling Status                      | <a href="#"><u>18-33</u></a> |
| Voice Signaling Status Field Descriptions           | <a href="#"><u>18-34</u></a> |
| Reset Module                                        | <a href="#"><u>18-34</u></a> |
| ■ About Menu                                        | <a href="#"><u>18-35</u></a> |
| Display Module Identification                       | <a href="#"><u>18-35</u></a> |
| About Field Descriptions                            | <a href="#"><u>18-35</u></a> |

---

## **Regulatory Information**

---

### **North America**

The Octal Voice Application/Interface Module Set 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

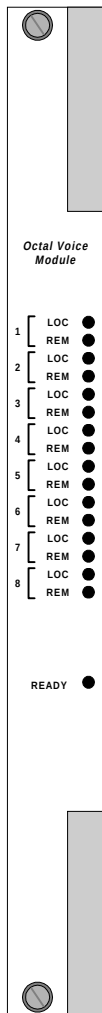
following the provisions of the EMC directive 89/336/EEC, and the Low voltage directive 73/23/EEC.

---

## Physical Description

The Octal Voice Application Module can be used with three Interface Modules. They are FXO-DPT, FXS-PLAR or E&M. The default interface module configuration is FXO-DPT, Loop Start.

A -48V power supply must be supplied to the DACS II AX chassis for voice to function. The power supply must be referenced to Telco Ground. In many installations, Telco Ground is the same as Frame Ground.



There are eight sets of LEDs, one set for each port, and a READY LED.

- **LOC** - green indicates off-hook status received from the backplane.
- **REM** - green indicates off-hook status received from the trunk.
- **READY** - green indicates the module is powered up and on-line.

If an off-hook condition is detected on a port, either the LOC (Location) or REM (Remote) LED will turn on depending if there is an inbound (LOC) or outbound (REM) call. The corresponding LOC or REM LED for that port will turn on when the session is established.

During initialization, Port 1's LOC and REM LEDs toggle ON and OFF to indicate Xilinx load in progress. Once the files are loaded, all LEDs flash simultaneously for 10 seconds and then OFF. When downloading system software, the LOC and REM LEDs on all 8 ports cascade to indicate the download is in progress. Upon completion of the download, the Octal Voice Module Set goes through the normal reset functions.

The READY LED indicates the status of the Octal Voice Module Set. It is off-line and flashes under the following conditions:

- Card Out of Service (All LEDs flash)
- Missing or invalid interface card
- No Connection Map received (Off the Bus)
- Backplane Clock Failure
- Missing Frame SYNC signal
- Hardware write to Backplane Memory inhibited.

**Figure 18-1. Octal Voice Application Module**



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.

## Octal Voice Interface Modules

There are three types of interface modules available with the Octal Voice Application Module.

- **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 detect ringing, and forward or reverse battery current, dependent on configuration. The 2W/FXO/DPT can extend dial tone to a remote PBX or support Direct Inward Dialing (DID).
- **Octal 2-Wire FXS/PLAR** - 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.
- **Octal 4-Wire E&M** - provides eight 4-wire interfaces via two 50-pin Telco type connectors. It supports Tip, Ring, Tip1, Ring1, E, M, SB, and SG leads.

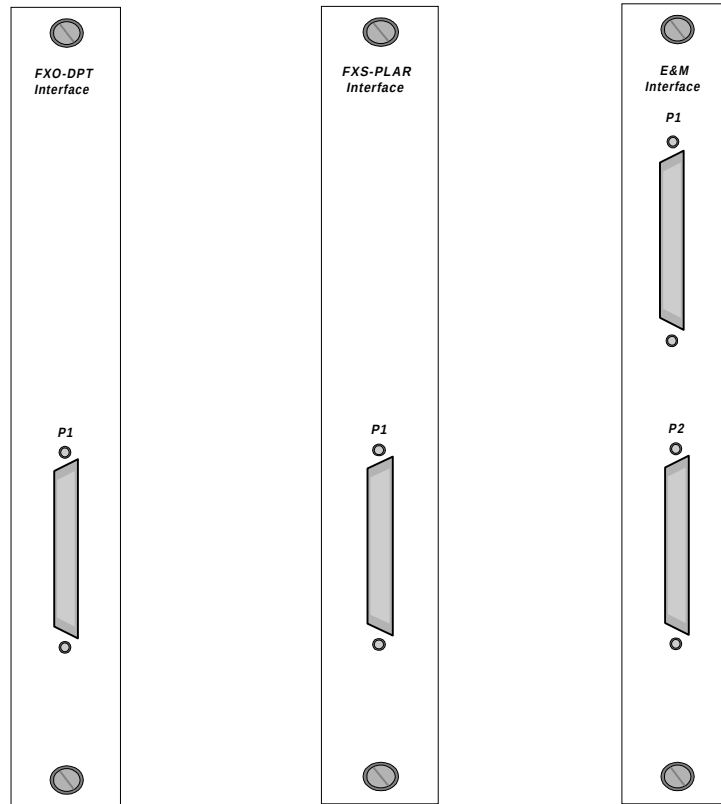


**Figure 18-2. Interface Modules used with the Octal Voice Application Module**

## **E&M Interface Module**

The following information provides detail about the E&M Interface Module and the Type I and Type II signaling jumper settings for the eight ports of the module.

The Octal Voice Application Module with the E&M Interface Module supports Type I and Type II signaling. It does not support Type I and Type II switching. [Figure 18-4](#) and [Figure 18-5](#) detail the E&M interface modules Type I and Type II signaling operations.

A 1200 ohm 2 watt resistor must be installed in the M lead wiring from the PBX to the DACS II AX in most cases. With the resistor installed, current in the M lead, when it is asserted should be between 22 and 32 mA.

Install the resistor before connecting to the DACS II AX. After the resistor has been installed connect the cable to the DACS II AX. Assert the M lead and verify that the voltage drop across the resistor is between 26 volts and 38 volts.

Connections for the 4 watt E&M card uses 2 punch down blocks for all 8 channels. If 32 mA of current is exceeded add the 1200 ohm 2 watt resistors as shown in the [Figure 18-3](#).

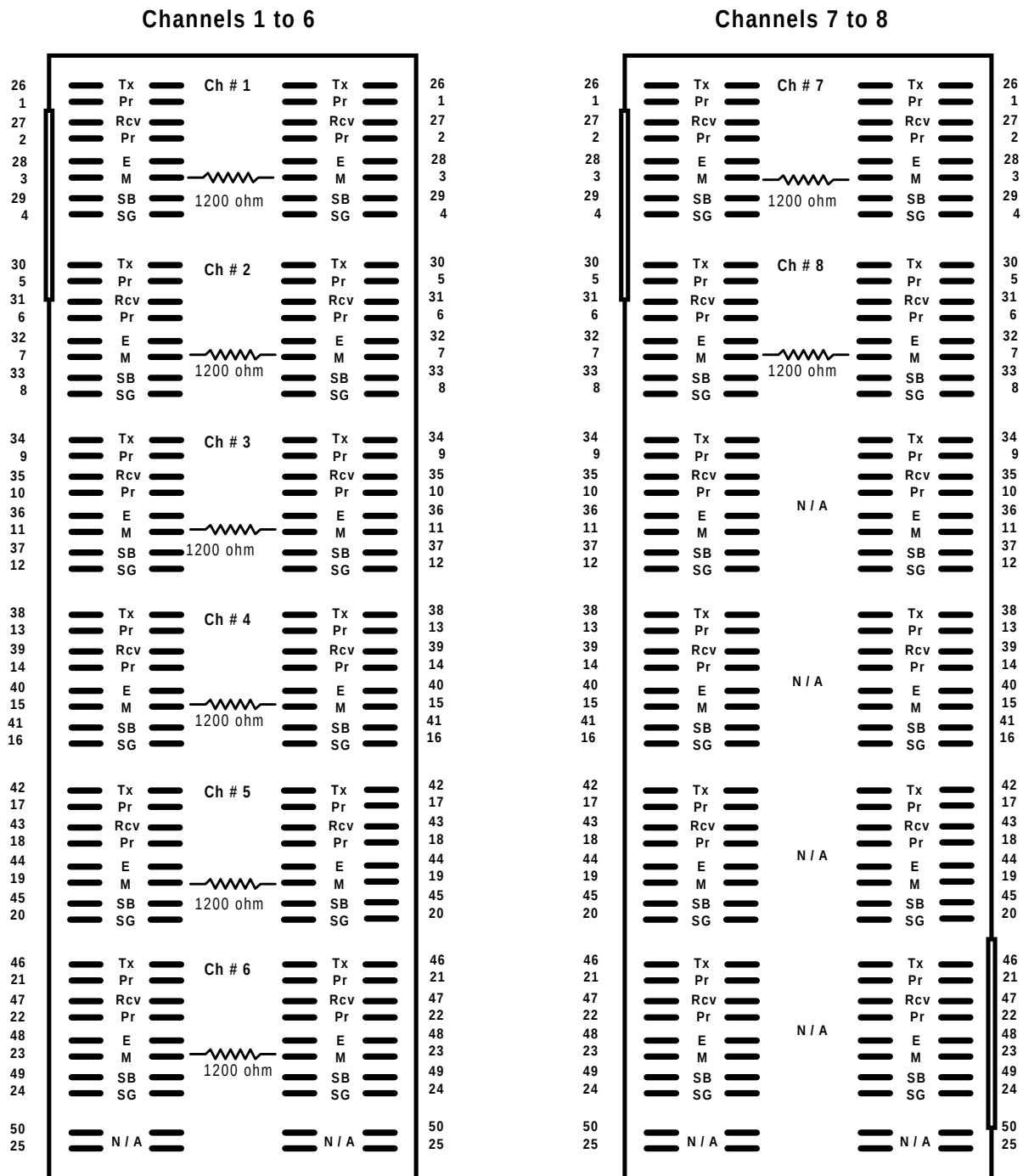


Figure 18-3. E&M Type I Signaling

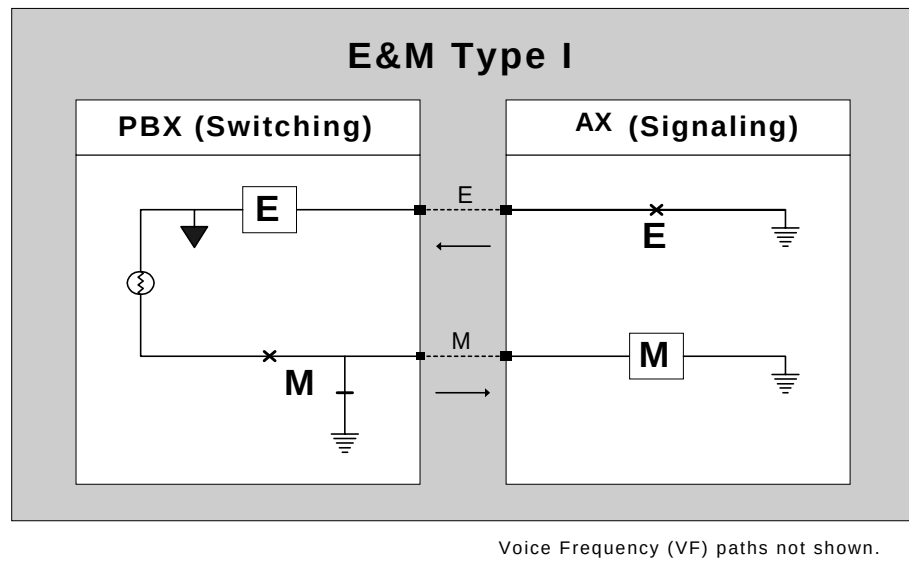


**Figure 18-4. E&M Type I Signaling Operation**

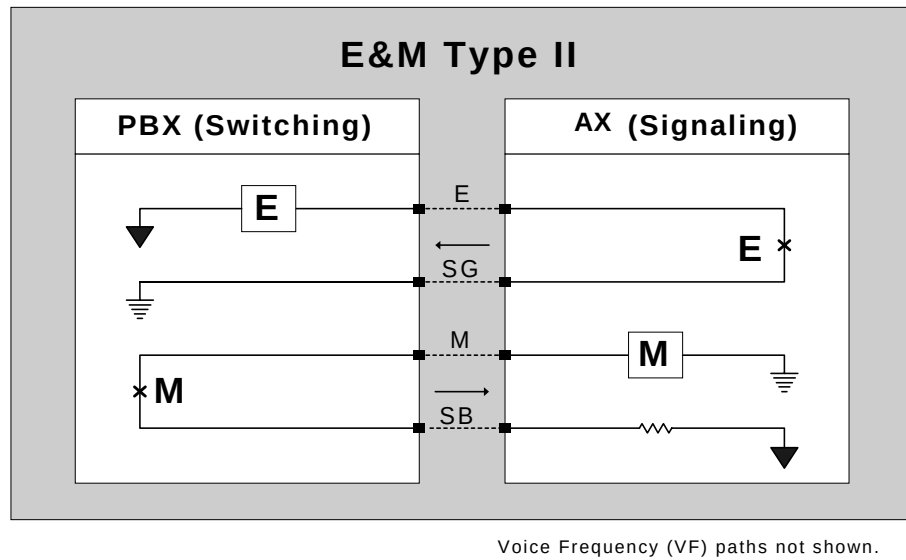


**Figure 18-5. E&M Type II Signaling Operation (Default)**

[Figure 18-5](#) details the ports and pin outs of the E&M Interface Module. It also contains a table to show you where to place the jumpers for Type I and Type II signaling. Row two for each port will need a jumper for Type I signaling. Row four for each port will need a jumper for Type II signaling. To avoid damage, install or remove jumpers carefully.

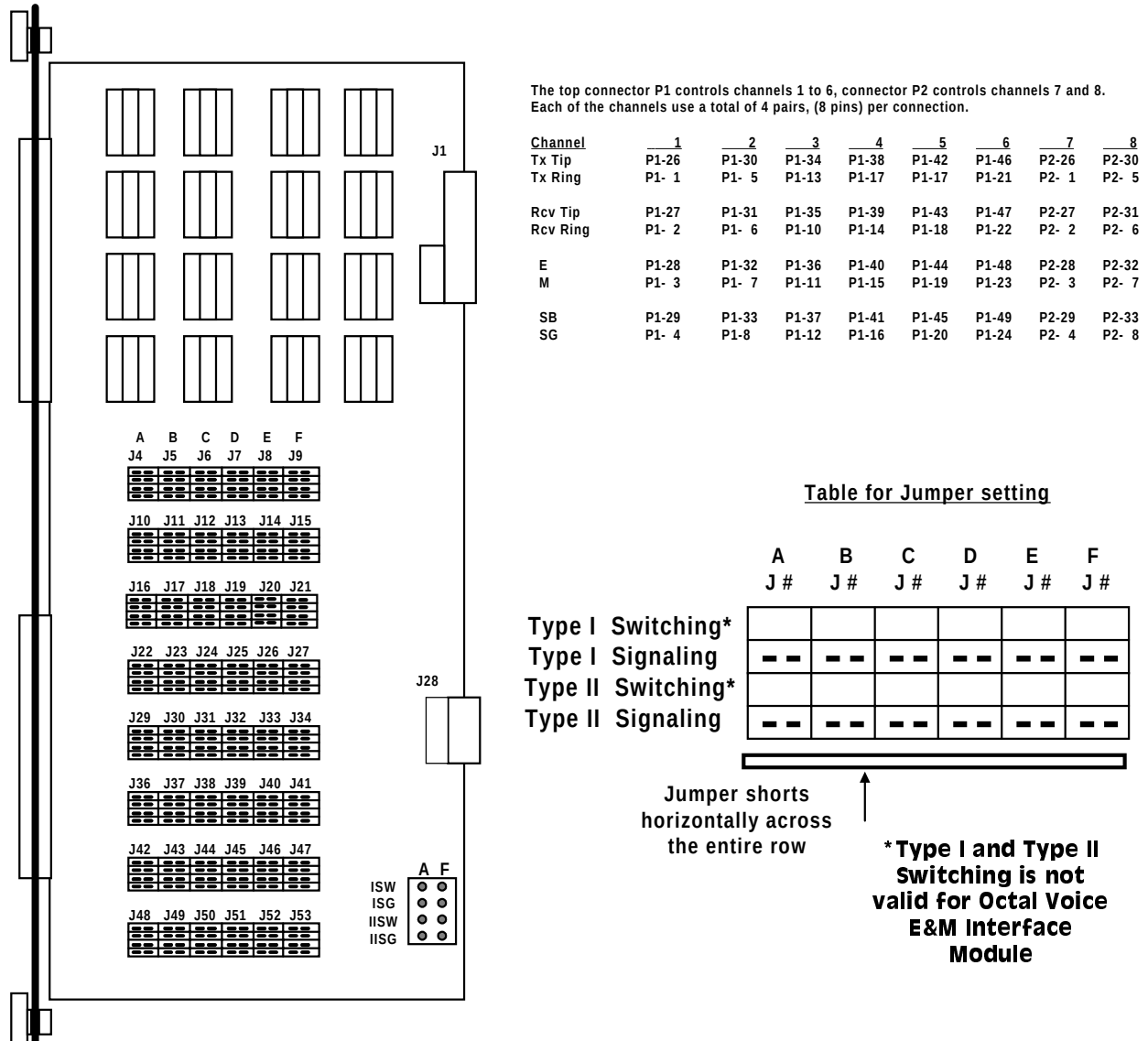


**Figure 18-6. Jumper Settings for the E&M Interface Card**

## Before You Begin

---

- This chapter is written for ADMINISTRATOR-level users.
  - A slot must be configured for the Octal Voice module.
  - The Octal Voice application module and one of the three Octal Voice interface modules must be physically present in the DACS II AX chassis.
  - There are three different types of interface modules that can be used with the Octal Voice Application Module. The interface module must be configured for the correct type prior to configuring the ports and running diagnostics. To configure the interface module see [Configure for an Interface Module: page 18-17](#).
  - If you are using the E&M Interface Module, you must determine if your application requires Type I or Type II signaling. You must physically move the jumper to row 2 for Type I signaling or row 4 for Type II signaling.
  - A connection map must first be configured in order for the Octal Voice Module to register a status of "On The Bus". This connection map must be configured for a speed of 64 K (1 DS0) and Voice. If a connection map is not configured the status will read "Off The Bus". Refer to Chapter 5, *Connection Map Configuration* for details on activating and configuring connections maps.
  - For cabling and interface requirements, refer to Appendix B.
-

## **Configuring A Slot for the Octal Voice Module**

---

**Configure Slot**      Configure a slot for the Octal Voice module. Refer to [Configuring a Slot: page 4-8](#).

---



## **Configuring the Octal Voice Module**

---

### **Procedural Overview**

To configure the Octal Voice module, complete these tasks:

| <b>Task</b>                                                                                                        | <b>See Procedure on Page</b>                                                                 |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Access the Octal Voice Card Configuration Menu                                                                     | <a href="#"><u>18-14</u></a>                                                                 |
| Configure for an Interface Module                                                                                  | <a href="#"><u>18-17</u></a>                                                                 |
| One of the following:<br>Configure FXO-DPT Parameters<br>Configure FXS-PLAR Parameters<br>Configure E&M Parameters | <a href="#"><u>18-19</u></a><br><a href="#"><u>18-21</u></a><br><a href="#"><u>18-23</u></a> |

---

## Access the Octal Voice Card Configuration Menu

### Purpose

From the Octal Voice Card Configuration Menu, you can:

- configure for the rear card type
- configure the ports on the rear card

### Procedure

To access the Octal Voice Card Configuration Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*, move the cursor to the slot where the Octal Voice application module is located and press **P** for **[P]ort/Link Cfg**.

You must use press **P** to configure the module. If you go through the module's Main Menu, you will access view-only configuration screens.

The Octal Voice Card Configuration Menu displays ([Figure 18-7](#)).

|                                                                            |        |                          |            |            |          |            |
|----------------------------------------------------------------------------|--------|--------------------------|------------|------------|----------|------------|
| Lucent Technologies                                                        |        | DACS II AX - Octal Voice |            |            | Slot: 05 | 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 18-7. Octal Voice Card Configuration Menu**

## **Octal Voice Card Configuration Field Descriptions**

The following list describes the fields that are displayed on the *Octal Voice Card Configuration Menu*. This menu will contain different information in the fields depending upon the interface module selected. These fields are read only (except for the Configured rear card type if an interface module has not been configured) and are configured in the *Octal Voice Card Configuration* submenu.

**Port #:** The port to be configured.

**Name:** This is a user-defined field. Any name up to 14 characters in length is used to identify each port on the Octal Voice. Some users find it beneficial to use circuit numbers to name the ports.

**Port Status:** This field displays the status of the port. The status will either be *In Service* or *Out Of Service*.

**Port Type:** This field displays the port type depending upon the interface module rear card type.

The following port types will be displayed when the Octal Voice Application Module is used with the **FXO-DPT Interface Module**:

- Loop Start - (default)
- Ground Start
- E&M IS to LS (Immediate Start to Loop Start)
- E&M IS to GS (Immediate Start to Ground Start)

The following port types will be displayed when the Octal Voice Application Module is used with the **FXS-PLAR Interface Module**:

- Loop Start - (default)
- Ground Start
- PLAR

The following port types will be displayed when the Octal Voice Application Module is used with the **E&M Interface Module**:

The type and mode settings for the ports are selected by placing the appropriate jumper blocks in the rear card. This is to be done prior to configuring the E&M Interface Module. The following lists the possible displays in the Type and Mode field:

| Type   | Mode      |
|--------|-----------|
| E&M I  | Signaling |
| E&M II | Signaling |

The mode field will display invalid when the jumper is on row 1, E&M I Switching or row 3, E&M II Switching.

**Codec Mode:** This field display the coding algorithm. The default is *mu-law* for North American and Japan. *A-Law* for all others.

**Rx Gain:** This field displays the PCM receive signal gain from *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

**Tx Gain:** This field displays the PCM transmit signal gain from *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

**Configured Rear Card Type:** (*option field*) Your choices are *Octal Voice FXO/DPT*, *Octal Voice FXS/PLAR* or *Octal Voice E&M*. If the interface module has already been configured for the correct rear card type, you will not be able to move the cursor to this field.

**Actual Rear Card Type:** This field displays the type of interface module and the configured rear card type. It will show either *Octal Voice FXO/DPT*, *Octal Voice FXS/PLAR* or *Octal Voice E&M*.

**Operation Mode:** The operation mode is PCM, 64 Kbps.

**Backplane Status:** This field display the status that enables the card to communicate with the DACS II AX Backplane. It will display either *On the Bus* or *Off the Bus*.

---

## Configure for an Interface Module

### Before you begin

The Octal Voice Application Module's default setting for the rear card type is the FXO-DPT Interface Module. If the FXS-PLAR Interface Module, or E&M Interface Module is used, then an **\*\*Invalid Rear Card\*\*** message displays on the *Voice Card Main Menu* and *Octal Voice Card Configuration Menu* until the card is configured. Use the following procedure to identify the installed interface module.

If there is no rear interface module installed for an Octal Voice module, the Node Summary displays a Critical alarm for that slot. To clear the alarm, install an interface module and configure for the correct rear card type. The Ready LED on the Octal Voice application module will be flashing green until the interface card is present, configured to the proper rear card type and on the bus.

### Procedure

To configure an interface module, follow these steps:

1. Place the interface module in the rear slot of the DACS II AX chassis. Make sure it is in the same slot as the Octal Voice Application Module.
2. From the *DACS II AX Main Menu*, select *Node Summary*, move the cursor to the slot where the Octal Voice application module is located and press **P** for **[P]ort/Link Cfg**.

You must use press **P** to configure the module. If you go through the module's Main Menu, you will access view-only configuration screens.

The Octal Voice Card Configuration Menu displays ([Figure 18-8](#)).

|                                                                            |        |                          |            |            |         |            |  |
|----------------------------------------------------------------------------|--------|--------------------------|------------|------------|---------|------------|--|
| Lucent Technologies                                                        |        | DACS II AX - Octal Voice |            | Slot: 05   |         | 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 FXO/DPT Operation Mode: PCM64Kbps    |        |                          |            |            |         |            |  |
| Actual Rear Card Type....:Octal Voice FXO/DPT Backplane Status: On the Bus |        |                          |            |            |         |            |  |

**Figure 18-8. Octal Voice Card Configuration Menu**

3. Use the **<Spacebar>** to move the cursor to the *Configured Rear Card Type* field. Press **<Enter>** to toggle to the correct interface module type. Your choices are *Octal Voice FXO/DPT*, *Octal Voice FXS/PLAR* or *Octal Voice E&M*. If the interface module has already been configured for the correct rear card type, you will not be able to move the cursor to this field.

4. Press **X** to save your selection.

A screen message displays:

*Rear Card Type changed, RESET the card? Are you sure? (Y/N)?*

5. Press **Y**.

This message displays:

*ALERT! Please wait while the card prepares to reset! Press any key to continue.*

6. Press any key to return to the *Node Summary Menu*.

After pressing any key, all LEDs on the Octal Voice module illuminate. It takes approximately 45 seconds for the Octal Voice Application and Interface modules to reset. All menus are inaccessible until reset is complete. The Node Summary Menu displays and the Device State of the Octal Voice Module should show *On-line*.

---

## Configure FXO-DPT Parameters

To configure the FXO-DPT parameters, follow these steps:

1. From the *DACS II AX Main Menu*, select *Node Summary*, move the cursor to the slot where the Octal Voice application module is located and press **P** for **[P]ort/Link Cfg**.
2. From the *Octal Voice Card Configuration Menu* place your cursor on the port you want to configure and press **<Enter>**. The following submenu displays:

```
Lucent Technologies DACS II AX - Octal Voice Slot: 05 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 18-9. FXO-DPT Configuration Submenu**

3. Configure all parameters for each port number. Use the **<Spacebar>** to navigate between fields and the **<Enter>** key to toggle between options. Refer to the *FXO - DPT Configuration Submenu Field Descriptions* at the end of this section for descriptions of the options available for each field.
4. Press **X** to save changes.  
The following message displays:  
*Update configuration? Are you sure (Y/N)?*
5. Press **Y** to save your changes or press **N** to cancel changes. You return to the *Octal Voice Card Configuration Menu*.

**FXO-DPT  
Configuration  
Submenu Field  
Descriptions**

**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*) *Out of Service* is the default setting. This field determines the status of the port. The status will either be *In Service* or *Out Of Service*.

**Port Type:** (*option field*) You must check with your supplier to find out which start you will need to select. The following port types are available for the FXO-DPT interface card:

- **Loop Start:** (*Default*) Primarily used where seizing is done in only in one direction.
- **Ground Start:** Primarily used where seizing takes place in either direction.
- **E&M IS to LS:** (Immediate Start to Loop Start) - E&M signalling to a loop start channel
- **E&M IS to GS:** (Immediate Start to Ground Start) - E&M signalling to a ground start channel

**Codec Mode:** (*option field*) a coding algorithm. Select *mu-law (default)* for North American and Japan; *A-Law* for all others.

**Rx Gain:** (*option field*) adjusts the PCM receive signal gain. The options are *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

**Tx Gain:** (*option field*) adjusts the PCM transmit signal gain. The options are *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

## **COMMANDS**

**Use Default Settings = [D]:** Press **D** to return your selections to the default settings.

---



## Configure FXS-PLAR Parameters

To configure the FXS-PLAR parameters, follow these steps:

1. From the *DACS II AX Main Menu*, select *Node Summary*, move the cursor to the slot where the Octal Voice application module is located and press **P** for **[P]ort/Link Cfg**.
2. From the *Octal Voice Card Configuration Menu* place your cursor on the port you want to configure and press **<Enter>**. The following submenu displays:

```
Lucent Technologies DACS II AX - Octal Voice Slot: 05 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 18-10. FXS-PLAR Configuration Submenu**

3. Configure all parameters for each port number. Use the **<Spacebar>** to navigate between fields and the **<Enter>** key to toggle between options. Refer to the *FXS - PLAR Configuration Submenu Field Descriptions* at the end of this section for descriptions of the options available for each field.
4. Press **X** to save changes.  
The following message displays:  
*Update configuration? Are you sure (Y/N)?*
5. Press **Y** to save your changes or press **N** to cancel changes. You return to the *Octal Voice Card Configuration Menu*.

**FXS - PLAR  
Configuration  
Submenu Field  
Descriptions**

**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*) *Out of Service* is the default setting. This field determines the status of the port. The status will either be *In Service* or *Out Of Service*.

**Port Type:** (*option field*) You must check with your supplier to find out which start you will need to select. The following port types are available for the FXS-PLAR interface module:

- **Loop Start:** (*Default*) Primarily used where seizing is done in only in one direction.
- **Ground Start:** Primarily used where seizing takes place in either direction.
- **PLAR:** Private Line Automatic Ringdown.

**Codec Mode:** (*option field*) a coding algorithm. Select *mu-law (default)* for North American and Japan; *A-Law* for all others.

**Rx Gain:** (*option field*) adjusts the PCM receive signal gain. The options are *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

**Tx Gain:** (*option field*) adjusts the PCM transmit signal gain. The options are *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

**COMMANDS**

**Use Default Settings = [D]:** Press **D** to return your selections to the default settings.

---

## Configure E&M Parameters

To configure E&M parameters, follow these steps:

1. From the *DACS II AX Main Menu*, select *Node Summary*, move the cursor to the slot where the Octal Voice application module is located and press **P** for **[P]ort/Link Cfg**.
2. From the *Octal Voice Card Configuration Menu* place your cursor on the port you want to configure and press **<Enter>**. The following submenu displays:

```
Lucent Technologies DACS II AX - Octal Voice Slot: 05 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
```

**Figure 18-11. E&M Configuration Submenu Menu**

3. Configure all parameters for each port number. Use the **<Spacebar>** to navigate between fields and the **<Enter>** key to toggle between options. Refer to the *E&M Configuration Submenu Field Descriptions* at the end of this section for descriptions of the options available for each field.
4. Press **X** to save changes.  
The following message displays:  
*Update configuration? Are you sure (Y/N)?*
5. Press **Y** to save your changes or press **N** to cancel changes. You return to the *Octal Voice Card Configuration Menu*.

**E&M  
Configuration  
Submenu Field  
Descriptions**

**Port #:** The port to be configured.

**Name:** (*text field*) This is a user-defined field. Any name up to 11 alphanumeric characters in length can be entered to identify each port on the Octal Voice. You may 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*.

**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. The options are *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

**Tx Gain:** (*option field*) adjusts the PCM transmit signal gain. The options are *0dB* (default), *+2dB*, *+4dB*, *+6dB*, *+8dB*, *-6dB*, *-4dB*, *-2dB*.

**COMMANDS**

**Use Default Settings = [D]:** Press **D** to return your selections to the default settings.

---

## **Access the Octal Voice Main Menu**

---

### **Purpose**

From the *Octal Voice Card Main Menu* you can display the module configuration, run diagnostic tests, access utilities, and display module identification (software and hardware revision levels).

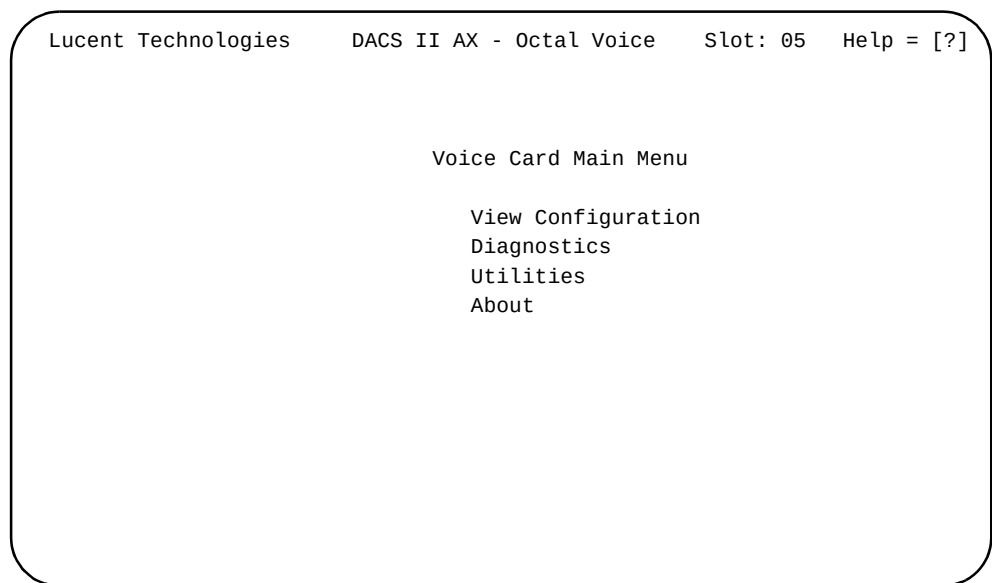
On the Node Summary Menu, the Configured Type must display "Octal Voice" and the Device State must display "On-line" or "Standby" in order to access the Octal Voice Module Main Menu. If the Device State is "Off-line", an alert message is generated

---

### **Procedure**

To access the Octal Voice Main Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*.
2. Place your cursor on the slot number where the *Octal Voice Module* is located and press **<Enter>**. The *Voice Card Main Menu* displays.



---

**Figure 18-12. Voice Card Main Menu**

## Diagnostics Menu

This menu allows you to perform various diagnostics on a selected port out of eight available ports. You should be able to perform these tests without affecting the performance of the other ports that are not being tested.

Only the ports that are "In Service" are accessible for diagnostics. The FXO-DPT, FXS-PLAR and E&M Interface Modules have the same diagnostics functionality. The following procedures are applicable for all three interface modules.

### Run Diagnostics

To run diagnostics, follow these steps:

1. From the *Octal Voice Card Main Menu*, place your cursor on the *Diagnostics* field and press **<Enter>**. The following menu displays:

Lucent Technologies

DACS II AX - Octal Voice

Slot: 05

Help = [?]

Octal Voice Card Diagnostics

| Port# | Name   | Test Type        | Port Status | Run Time |
|-------|--------|------------------|-------------|----------|
| 01    | Port01 | Normal Operation | In Service  | 81       |
| 02    | Port02 | Normal Operation | In Service  | 81       |
| 03    | Port03 | Normal Operation | In Service  | 81       |
| 04    | Port04 | Normal Operation | In Service  | 81       |
| 05    | Port05 | Normal Operation | In Service  | 81       |
| 06    | Port06 | Normal Operation | In Service  | 81       |
| 07    | Port07 | Normal Operation | In Service  | 81       |
| 08    | Port08 | Normal Operation | In Service  | 81       |

Current Backplane Status.....: On the Bus

Clear Run Time = [R]

Clear All Counters = [A]

**Figure 18-13. Octal Voice Card Diagnostics Menu**

- ```
Lucent Technologies          DACS II AX - Octal Voice          Slot: 05    Help = [?]

                               Octal Voice Card Diagnostics

-----

Port# Selected....: 1
Name.....: Port01
Select Test Type.: Normal Operation


Tone Generator Setup = [S]
```

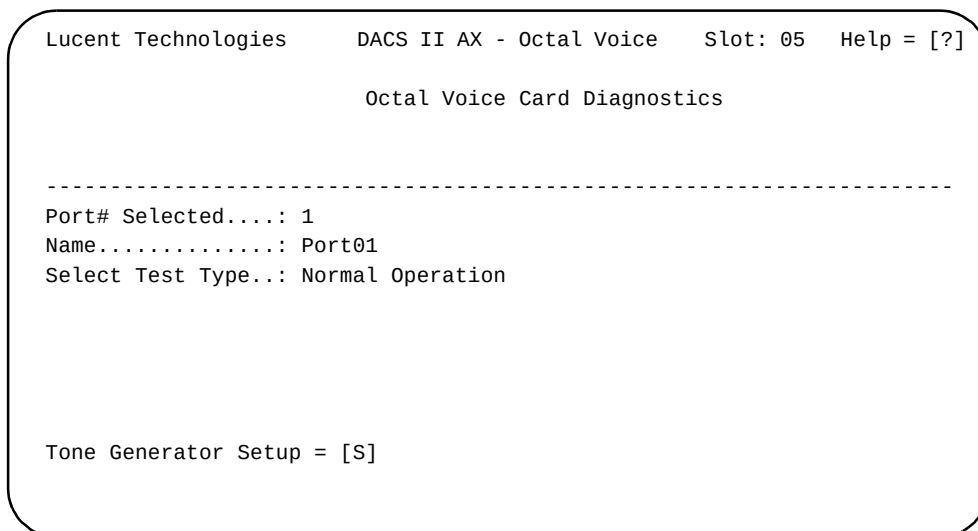
Figure 18-14. Octal Voice Card Diagnostics Submenu

-

Set Up Tone Generator Diagnostics

To set up tone generator diagnostics, follow these steps:

1. From the *Voice Card Main Menu*, select *Diagnostics*.
2. Place your cursor on a port number and press **<Enter>**. The following submenu displays:



The screenshot shows a terminal window with the following text:

```
Lucent Technologies      DACS II AX - Octal Voice   Slot: 05   Help = [?]  
  
                          Octal Voice Card Diagnostics  
  
-----  
Port# Selected....: 1  
Name.....: Port01  
Select Test Type..: Normal Operation  
  
  
Tone Generator Setup = [S]
```

Figure 18-15. Octal Voice Card Diagnostics Submenu

3. In the Select Test Type field, press **<Enter>** until the *Tone Generator* option displays.

4. Press **S** for the Tone Generator Setup and the following screen displays:

```
Lucent Technologies   DACS II AX - Octal Voice   Slot: 05   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 18-16. Tone Generator Setup Submenu

The Tone Generator Setup Submenu initially displays default values.

5. Select the Tone Type, Tone Frequency, and Tone Gain by pressing **<Enter>** on the corresponding fields to toggle between the options.
6. Press **X**
The following message displays:
Update configuration? Are you sure (Y/N)?
7. Press **Y** to update diagnostics and return to the *Octal Voice Card Diagnostics Menu* or press **N** to cancel changes and return to the *Octal Voice Card Diagnostics Menu*.

Diagnostics Field Descriptions

Port #: The port number selected from the *Diagnostics* menu.

Name: This is a user-defined field selected from the *Configuration Entry* submenu.

Test Type: (*option field*) A host of tests can be run on an Octal Voice Module Set. One test for each port or a maximum of eight tests per module set can be selected. The exception is the *Digital Loopback* test. The *test type* should be set to *Normal Operation* at the end of your testing period.

- **Normal Operation** - (*default*) This is the operating mode the Octal Voice Module Set is in when you are not performing tests.

- **Digital Loopback** - Permits testing of logic that generates timing for the transmit and receive highways. Only one test can be run on one of the 8 ports at a time. Configuration Maps should be set up prior to running this test. Refer to Chapter 4, *Connection Map Configuration* for details.
- **Analog Loopback** - Confirms backplane interface logic and transmit/receive highway timing/control are fully functional. One test for each port or a maximum of eight tests per module set can be selected. Configuration Maps should be set up prior to running this test. Refer to Chapter 4, *Connection Map Configuration* for details.
- **Backplane Loopback** - Puts the channel in the backplane loopback by forcing the destination time slot to be the same as the source time slot. One test for each port or a maximum of eight tests per module set can be selected.
- **Backplane Loopback with Tx idle** - A channel is connected to itself via a backplane connection. One test for each port or a maximum of eight tests per module set can be selected.
- **Transmit Idle Pattern** - The transmit idle pattern will be transmitted from the external equipment to the CODEC. One test for each port or a maximum of eight tests per module set can be selected.
- **Receive Idle Pattern** - An idle pattern is generated by the CODEC toward the external equipment. One test for each port or a maximum of eight tests per module set can be selected.
- **Tone Generator** - This diagnostic tool allows you to verify the integrity of the circuit. One test for each port or a maximum of eight tests per module set can be selected.

Tone Type: (*option field*) You can select either *DTMF* or *Other*.

Tone Frequency: (*option field*) The *DTMF* frequency ranges from 697 Hz + 1209 Hz to 941 Hz + 1633 Hz. The *Other* frequency ranges from 1k, 16 Hz mod to 2100 Hz, *Single Tone*.

Tone Gain: (*option field*) Allows an adjustment of the receive gain control from -36dB to -6dB.

Port Status: This field displays the status of the port. The status will either be *In Service* or *Out of Service*.

Run Time: Displays a running time of the active port. The elapsed time since the test is enabled is displayed and updated every one second.

INDICATORS

Current Backplane Status: An *On-line/Off-line* status that displays the communication with the DACS II AX Backplane.

COMMANDS

Clear Run Time = [R]: Resets the run time of the current active port back to zero.

Clear All Counters = [A]: Resets the values of all ports back to zero.

Utilities Menu

The FXO-DPT, FXS-PLAR and E&M interface modules have the same utilities functionality. The following procedures are applicable for all three interface modules.

Access Utilities

To access the Utilities:

1. From the *Octal Voice Card Main Menu*, select *Utilities*. The following menu displays:

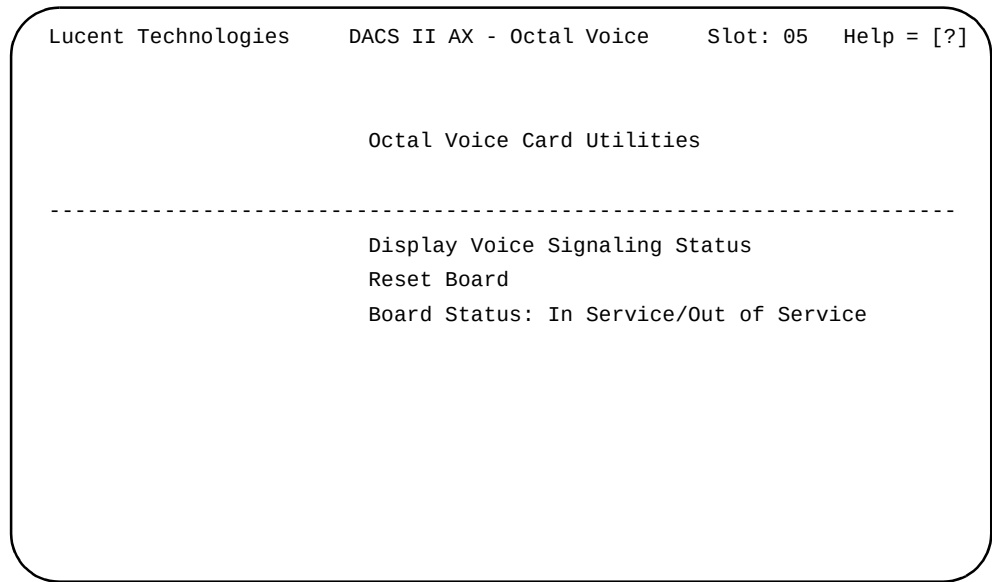


Figure 18-17. Octal Voice Card Utilities Menu

Display Voice Signaling Status

To access the Display Voice Signaling Status, follow these steps:

1. From the *Octal Voice Card Utilities Menu*, select *Display Voice Signaling Status*. The following menu displays:

```
Lucent Technologies      DACS II AX - Octal Voice      Slot: 05  Help = [?]
```

Display Voice Signaling Status

Port#	Port Status	'A' Status		'A' Transitions	
		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 18-18. Display Voice Signaling Status Menu

The *Display Voice Signaling Status* screen shows the status of the **LOC** (local) and **REM** (remote) ends either on hook or off hook. The status should be displayed and refreshed in one second intervals.

2. To reset the on-hook, off-hook transition counts press **R**.
3. Press **X** to return to the previous menu.

**Voice Signaling
Status
Field Descriptions**

Port #: The port number selected.

Port Status: This field displays the status of the port. The status will either be *In Service* or *Out Of Service*.



NOTE:

Before you take the board out of service, the board must be on the bus.

'A' Status: This field records when the LOC (local) and REM (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 a complete call.

'A' Transitions: This field records how often the hook status changes.

COMMANDS

Reset Transitions = [R]: Press **R** to reset the number of 'A' Transitions to 0.

Reset Module

This utility causes the Octal Voice Application Module and the Interface 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, connections will be restored.



CAUTION:

Resetting the module will cause data to be momentarily corrupted.

To reset the board:

1. From the *Octal Voice Card Utilities Menu*, place the cursor on the *Reset Board* field and press **<Enter>**.

The following message displays:

Reset This Octal Voice Card? Are you sure (Y/N)?

2. Press **N** to return to the *Utilities* menu.
 3. Press **Y** to reset the board and the next screen displays 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*.
-

About Menu

The About menu displays information about the software release and version, and details about the Octal Voice Application Module and the installed Rear Card.

Display Module Identification

To display module identification information:

1. From the Voice Card *Main Menu*, place your cursor on the *About* field and press **<Enter>**. The following screen displays:

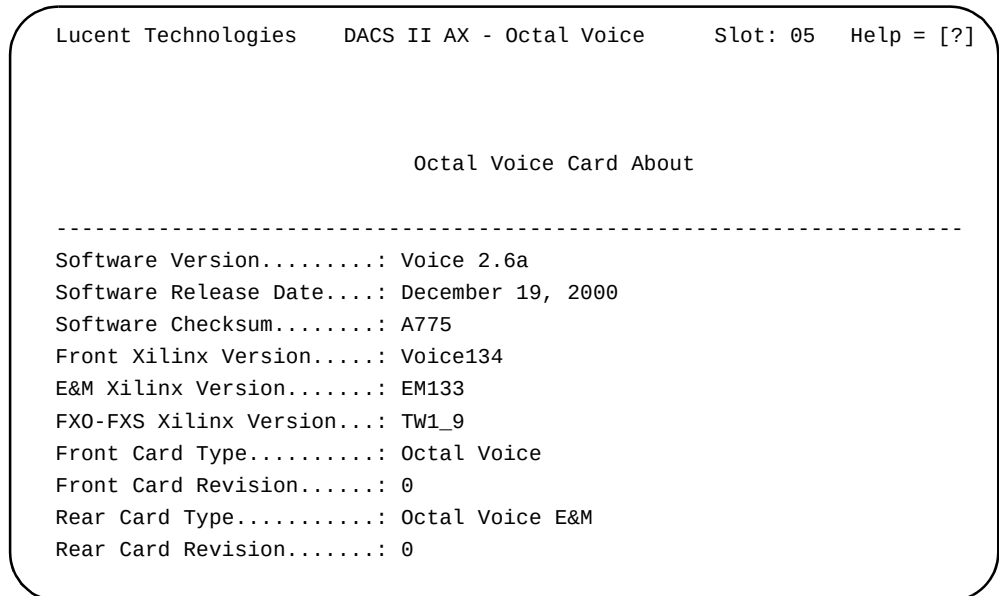


Figure 18-19. Sample About Menu with E&M Interface Module

About Field Descriptions

Software Version: Displays the software version currently residing in the Octal Voice's flash memory.

Software Release Date: Displays the date of module software release.

Software Checksum: Displays the sum of all bytes in the Octal Voice card's flash memory at power up. Also used to identify software version.

Front XILINX Version: Displays the hardware version of downloadable, programmable devices.

E&M XILINX Version: Displays the hardware version of downloadable, programmable devices.

FXO - FXS 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

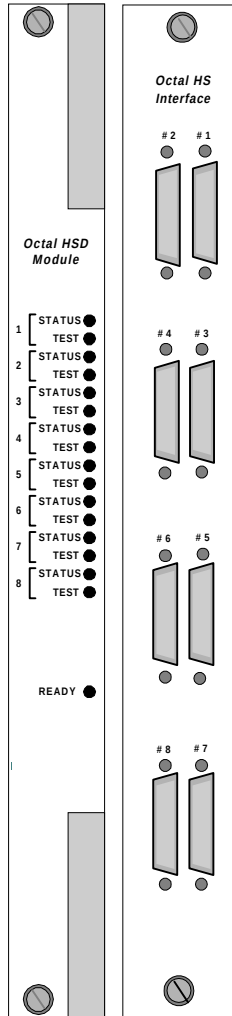
■ Physical Description	<u>19-5</u>
■ LED Indicators	<u>19-6</u>
STATUS	<u>19-6</u>
TEST	<u>19-7</u>
READY	<u>19-7</u>
■ Regulatory Information	<u>19-8</u>
North America	<u>19-8</u>
Product Safety	<u>19-8</u>
■ Port Timing	<u>19-9</u>
Internal Timing	<u>19-9</u>
External Timing Mode	<u>19-10</u>
Internal/External Timing Mode	<u>19-11</u>
■ Software-Selectable Interfaces	<u>19-12</u>
■ Data Rates	<u>19-14</u>
■ Control Signals	<u>19-15</u>
■ Diagnostics	<u>19-16</u>
Local Loopback	<u>19-16</u>
V.54 Loopback	<u>19-17</u>
Remote Loopback	<u>19-17</u>

Backplane Loopback	<u>19-18</u>
BERT	<u>19-18</u>
Remote OCU Non-Latching Test	<u>19-19</u>
■ Before You Begin	<u>19-20</u>
Notes about this Module	<u>19-20</u>
■ Configure Slot for Octal High Speed Module	<u>19-21</u>
Configure Slot	<u>19-21</u>
■ Configure Octal High Speed Data Ports	<u>19-22</u>
Before You Begin	<u>19-22</u>
Configure Ports	<u>19-22</u>
Port Configuration Field Descriptions	<u>19-28</u>
■ Octal High Speed Data Main Menu	<u>19-30</u>
Access Main Menu	<u>19-30</u>
■ View Configuration	<u>19-31</u>
Purpose	<u>19-31</u>
Related Task	<u>19-31</u>
Procedure	<u>19-31</u>
■ Diagnostics Menu	<u>19-32</u>
Before You Begin	<u>19-32</u>
Access Diagnostics Manager	<u>19-32</u>
Diagnostics Manager Field Descriptions	<u>19-33</u>
Diagnostics Manager Commands	<u>19-35</u>
No Connection Error	<u>19-35</u>
■ Bit Error Rate Test (BERT)	<u>19-36</u>
Overview	<u>19-36</u>
Before You Begin	<u>19-36</u>
Start BERT	<u>19-36</u>
Stop BERT	<u>19-37</u>
■ Diagnostic Loops	<u>19-38</u>
Loop Types	<u>19-38</u>
Select Loop Type	<u>19-38</u>
View Status of OHSD Port	<u>19-40</u>

■ Utilities Menu	<u>19-43</u>
Reset OHSD Module	<u>19-43</u>
Change Board Status	<u>19-44</u>
■ About Menu	<u>19-46</u>
Procedure	<u>19-46</u>
About Field Descriptions	<u>19-46</u>

Physical Description

The Octal High Speed Data (OHSD) Module Set provides eight synchronous DCE ports. Each port can be configured independently for EIA-232, EIA-422, EIA-530, EIA-530A, ITU-V.35, or ITU-X.21 operation. 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 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 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

The STATUS LED can be red, green, or off.

- 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

The TEST LED can be solid yellow, flashing yellow, or off.

- 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

The READY LED can be solid green, flashing green, red or off.

- 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)
- The LED indicator will be OFF if it is out of service.

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.

Port Timing

There are three synchronous timing mode options: Internal, External, and Internal/External. In addition, an option to invert the clock signal, regardless of selected timing mode, is available to facilitate installations and troubleshooting efforts. Furthermore, if an external clock source is utilized on any OHSD port, that port-level timing can be selected to be the DACS II AX system-wide reference.

Internal Timing

When you select the Internal timing mode, the OHSD module provides the DTE with both the transmit and receive timing information necessary to clock the data in and out at both ends. The only timing reference for this application comes from the DACS II AX system level timing, which is managed by the SMC. Internal timing is required for a local loopback.

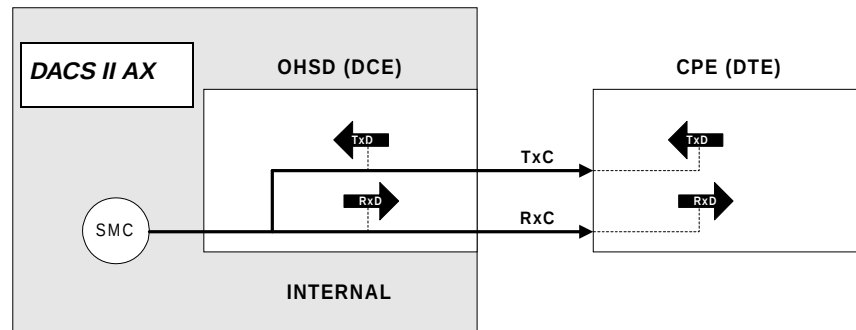


Figure 19-2. Internal Timing

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 (such as a T1/E1 port on the DACS II AX or another Stratum-level reference) or slips will occur.

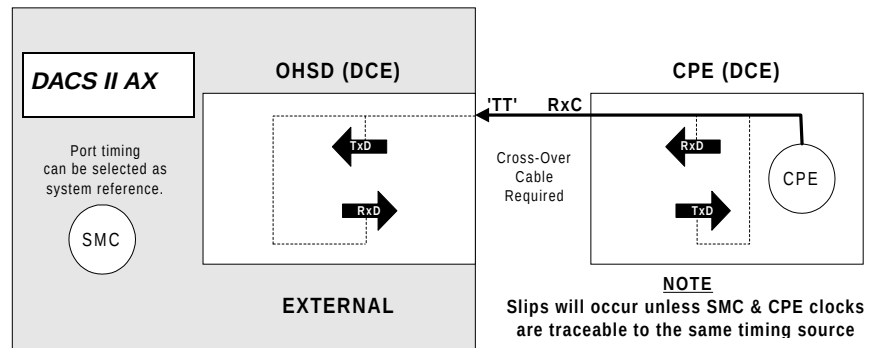


Figure 19-3. External Timing

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.

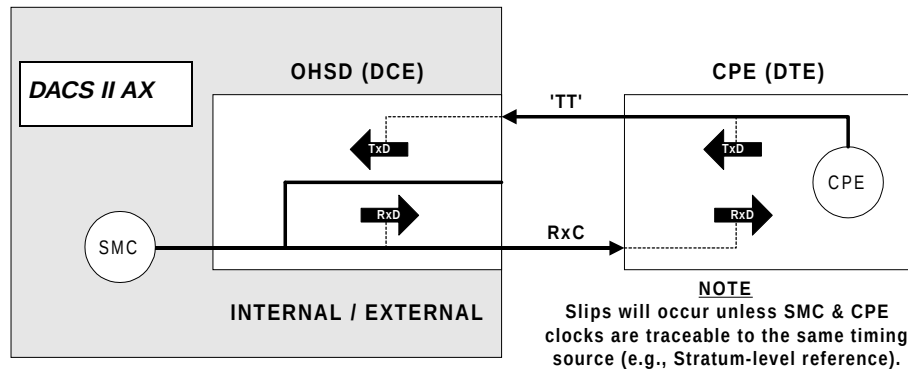


Figure 19-4. Internal/External Timing

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
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. The OHSD module supports DSR, DCD, and CTS. The option to track RTS is supported for CTS and DCD. 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.

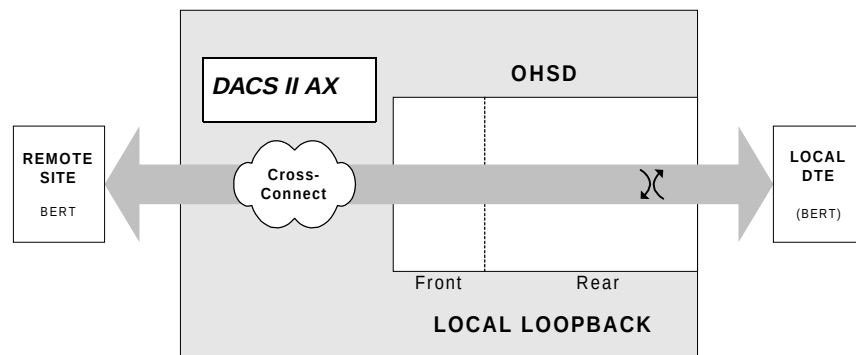


Figure 19-5. External testing using a Local Loopback



NOTE:

Port timing must be configured as internal (Int) in order for Local Loop to function properly, otherwise the port will fail a local loop test. Verify that the setting for Timing is Int on the Configuration menu.

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.

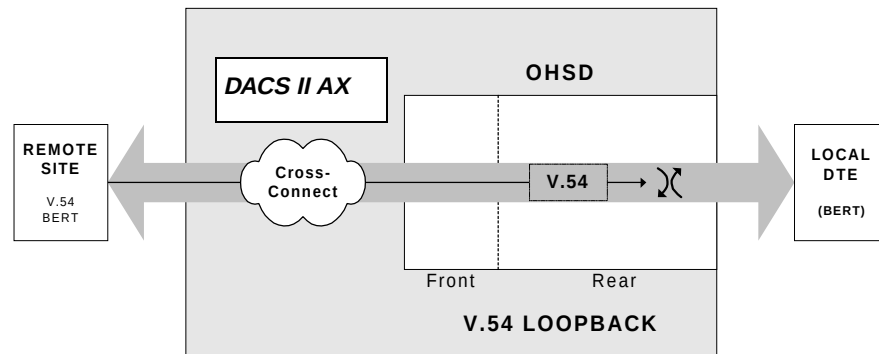


Figure 19-6. External testing using a V.54 Loopback

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.

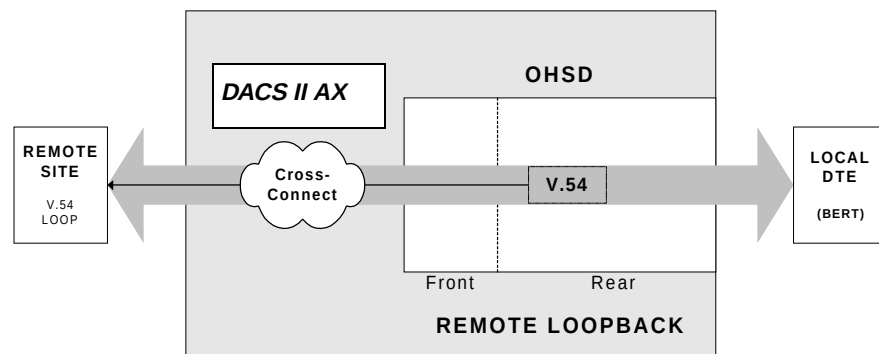


Figure 19-7. External testing using a Remote Loopback

Backplane Loopback

A Backplane Loopback is a useful diagnostic to fully test the port integrity of the OHSD module set as a whole.

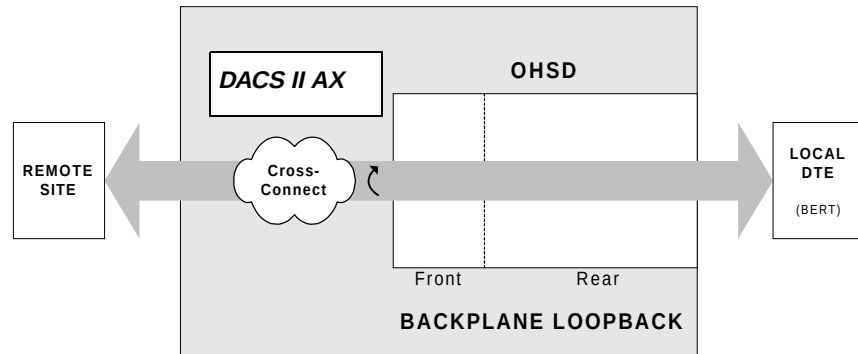


Figure 19-8. External testing using a Backplane Loopback

BERT

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.

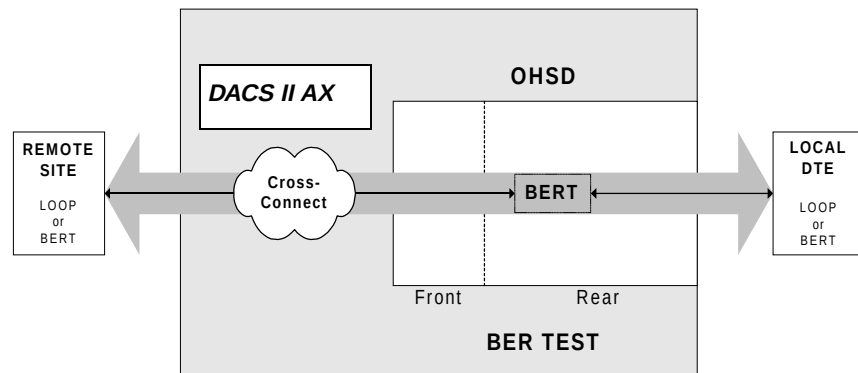


Figure 19-9. External testing using a Bit Error Rate Test

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.

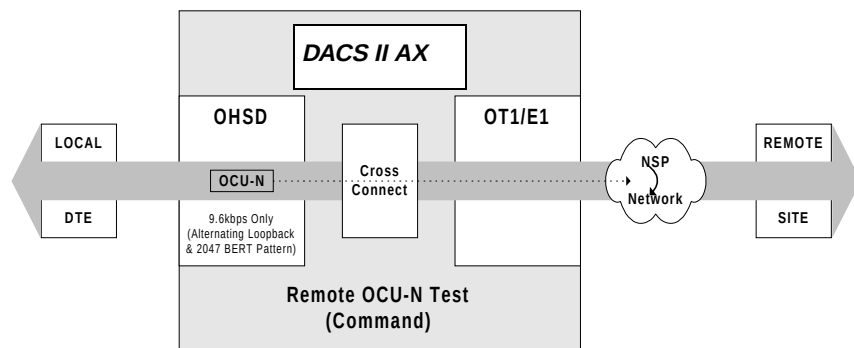


Figure 19-10. Remote OCU Non-Latching Test

Before You Begin

Notes about this Module

- A slot must be configured for the Octal High Speed module.
 - The Octal High Speed application module and rear interface must be physically present in the DACS II AX chassis.
 - For cabling and interface requirements, refer to Appendix B.
-

Configure Slot for Octal High Speed Module

Configure Slot Configure a slot for the Octal High Speed module. Refer to [Configuring a Slot: page 4-8](#).

Configure Octal High Speed Data Ports

Before You Begin Make sure that the slot has been configured for an Octal High Speed module.

Prior to entering the Ports Configuration Menu to configure the ports, you must set up a cross connection map. Refer to Chapter 5 for information on how 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). For NxDS0 and Special operating modes, the connection map can be configured with any speed.

Configure Ports To configure the ports on the Octal High Speed module:

1. From the *DACS II AX Main Menu*, you can do one of the following:
 - Select *Slot Configuration*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

The Ports Configuration Menu displays ([Figure 19-11](#)).

Lucent Technologies

DACS II AX - System Manager

Slot:02

Help = [?]

Ports Configuration

	Name	Type	Rate	xN	Timing	Data	Clock	DSR	DCD	CTS/I	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 19-11. Ports Configuration Menu

Place the cursor on any port number and press **<Enter>**. The Port Configuration menu displays ([Figure 19-12](#)).

```
Lucent Technologies   DACS II AX - System Manager   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 19-12. 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 fields display:

Lucent Technologies DACS II AX - System Manager 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 19-13. 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 fields display:

Lucent Technologies
DACS II AX - System Manager
Slot:02
Help = [?]

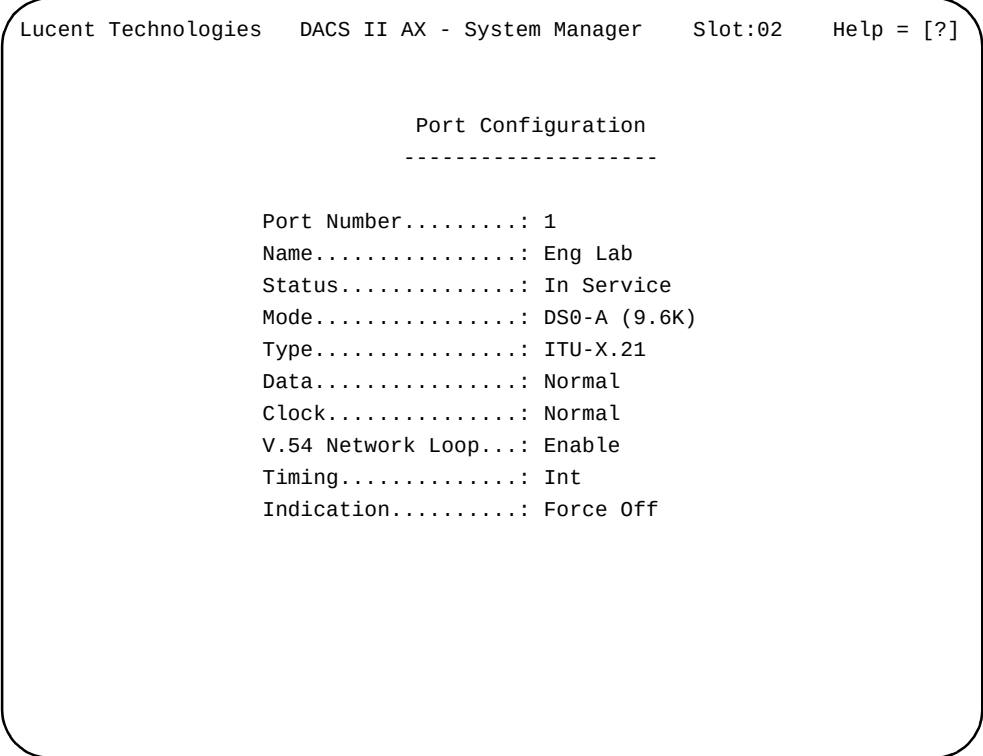
Port Configuration

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

Figure 19-14. 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 *E1 Type ITU-X.21 Type*, is available. When *E1 Type ITU-X.21* is chosen, the following fields display:



```
Lucent Technologies   DACS II AX - System Manager   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 19-15. Port 1 configured for ITU-X.21

The E1 ITU-X.21 option provides the DS0-A (9.6K) or NxDS0 options to appear in the Mode field and replaces the DCD, DSR, CTS and DTE options 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 5 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.

Octal High Speed Data Main Menu

Access Main Menu To access the Main Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*.
2. Place your cursor on the slot number where the Octal High Speed module is located and press **<Enter>**. The *Main Menu* displays ([Figure 19-16](#)).



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.

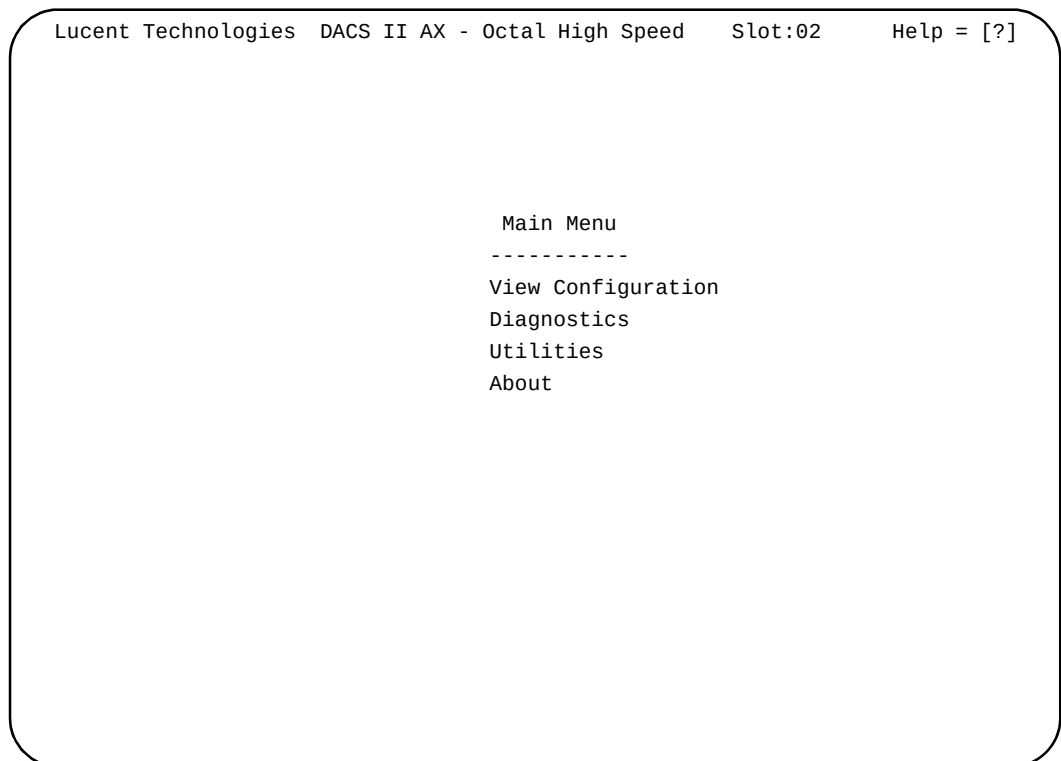


Figure 19-16. Octal High Speed Main Menu

From the *OHSD Main Menu*, you can display the module's port configuration, run diagnostic tests, access utilities, and display module identification.

View Configuration

Purpose The View Configuration option provides access to a display of the Octal High Speed port configuration.

Related Task To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.** For details, refer to [Configure Octal High Speed Data Ports: page 19-22](#).

Procedure To display the module configuration:

1. From the *Main Menu*, select *View Configuration*.
The Octal High Speed Port Configuration displays. The fields are described in [Port Configuration Field Descriptions: page 19-28](#).
2. Press **X** to return to the previous menu.

Diagnostics Menu

From this menu, you can view and perform diagnostics on the Octal High Speed ports.

Before You Begin

A module must be In Service to access the Diagnostics Menu.

Access Diagnostics Manager

To access the Diagnostics Manager:

1. From the *OHSD Main Menu*, select *Diagnostics*. The Diagnostics Menu displays ([Figure 19-17](#)).

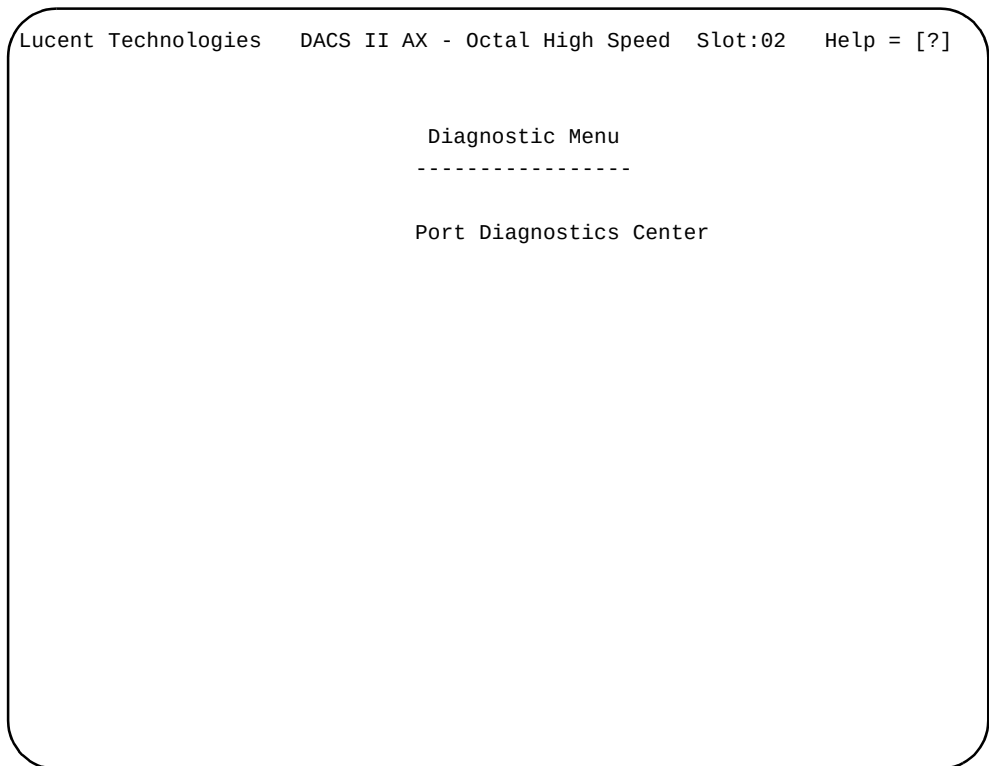


Figure 19-17. Diagnostics Menu

2. Select *Port Diagnostics Center* field. The Diagnostics Manager menu displays ([Figure 19-18](#)).

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]nsert Error									

Figure 19-18. Diagnostics Manager

The fields and commands that appear on the Diagnostic Manager Menu are described below.

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 traversing 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.

Diagnostics Manager Commands

The following commands are available from the Diagnostics Manager ([Figure 19-18](#)). To run a test or view statistics, place the cursor on the port and press one of the command keys:

- **[B] = Bert:** Provides several test patterns.
 - **[L] = Loop:** Provides several loopback options.
 - **[E] = Expose:** Displays the port status and allows you to clear counters for the port or insert errors.
 - **[C] = Clear Error Counters:** Clears **all** errored second counters for all eight ports. The errored seconds columns are reset to zero. The counter will automatically start again, recording the errors in 5 second intervals.
 - **[I] = Insert Error:** Allows you to insert errors on a port that has a BERT pattern running. The counter will record the errors in a 1 second interval.
-

No Connection Error

Prior to running diagnostics, you must set up a cross connection map. Refer to Chapter 5 for information on how 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). For NxDS0 and Special operating modes, the connection map can be configured with any speed.

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 (BERT)

Overview

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 in order to perform BERT.

Start BERT

To perform a BERT:

1. Place your cursor on an active port in the *Diagnostics Manager* menu and press **B** to select [B]ert. The BERT Select menu displays ([Figure 19-19](#)).

```
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 19-19. 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*.

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.

3. Press **X** to save.
 4. At the prompt, *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 *BERT Selection* submenu.
-

Stop BERT

To stop the BERT test:

1. Press **B** and the BERT Select submenu displays.
 2. Press **O** to turn off BERT.
 3. Press **X** to stop the BERT and return to the Diagnostics Manager menu.
 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.
-

Diagnostic Loops

Loop Types

The OHSD module has several loops available:

- Local Loop (port must have timing configured as Internal)
- Remote V.54 Loop
- Backplane Loop

For details, refer to [Diagnostics: page 19-16](#).

Select 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 Loop Select Screen displays the current loop settings.

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 19-20. Loop Select Screen

2. Turn loopbacks on or off.
 - For a local loop, press **L** to change the *Local* field to *On* or press **O** to change the *Local* field to *OFF*.

Port timing must be configured as internal (Int) in order for Local Loop to function properly, otherwise the port will fail a local loop test. Verify that the setting for Timing is Int on the Configuration menu.
 - Press **R** to change the *Remote V.54* field to *V.54* or press **f** to change the *Remote V.54* field to *Off*.
 - Press **B** to change the *Backplane Loop* field to *On*, or press **a** to change the *Backplane Loop* field to *Off*.

This loopback only affects an existing backplane connection. The loopback will not occur without a defined connection.
 3. Press **X** to set the configuration.
 4. 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*.
-

Status

The *Expose* function is used to display the 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.

View Status of OHSD Port

To view (Expose) the status of the OHSD port:

1. Place your cursor on an active port in the *Diagnostics Manager* menu and press **E** to select **[E]xpose**. The Port Status menu displays. The Port Status menu varies depending on the port configuration.

If your configuration mode is set for *DS0-A (9.6K) Special* or *NxDS0 Special*, then the following fields display:

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 19-21. Port Status - 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 fields display:

Lucent Technologies DACS II AX - Octal High Speed Slot:02 Help = [?]

Port Status

Port#: 5 Name: NxDS0 Type: EIA-530

	State	Errored Seconds
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 19-22. Port Status - 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 fields display:

```

Lucent Technologies      DACS II AX - Octal High Speed  Slot:02  Help = [?]

                                Port Status
                                -----

Port#: 6      Name: NxDS0 2      Type: ITU-X.21

                                State  Errored Seconds
Indication: Force Off      RX FIFO....: OK      0
Control....: Off          TX FIFO....: OK      0
                                CLOCK EDGE.: OK      0
                                Total.....:      0

[C]lear Counters [I]nsert Error
  
```

Figure 19-23. Port Status - NxDS0 or NxDS0-A (9.6K) mode and EI Type 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.

2. Press **C** to clear counters for this port.
The Errored Seconds column will reset to zero. The counter will automatically start again, recording the errors in 5 second intervals.
3. 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.
4. Press **X** to return to the *Diagnostics Manager Menu*.

Utilities Menu

The Utilities Menu provides access to two submenus from which you can reset the OHSD Module or set its status to *In Service* or *Out of Service*.

Reset OHSD Module

The reset 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.



CAUTION:

Resetting the module will cause data to be momentarily corrupted.

To reset the OHSD module:

1. From the Utilities Menu, select *Reset Device*. The following message displays:

```
Lucent Technologies   DACS II AX - Octal High Speed   Slot:01   Help = [?]  
  
                          Utilities Menu  
                          -----  
  
*****  
*                                                                    *  
*                          -MESSAGE! -                             *  
*                                                                    *  
*                          Reset Device?                            *  
*                                                                    *  
*                          Are you sure (Y/N)?                      *  
*                                                                    *  
*****
```

Figure 19-24. Reset Device 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 OHSD 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 OHSD 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 OHSD *Utilities Menu*, select *Board Status* field and press **<Enter>**. If the board status is *In Service*, the following message displays:

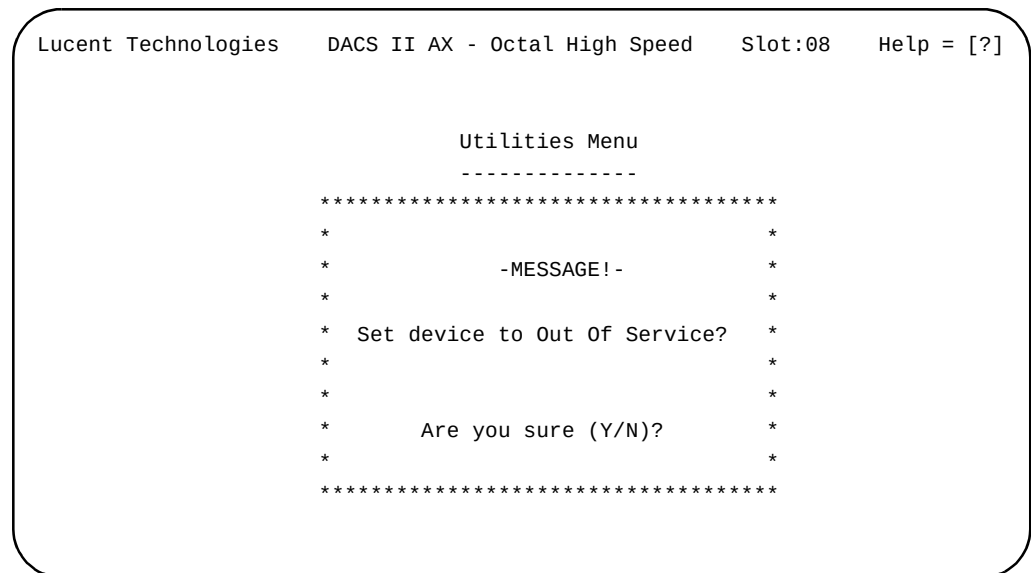


Figure 19-25. Board Status Screen

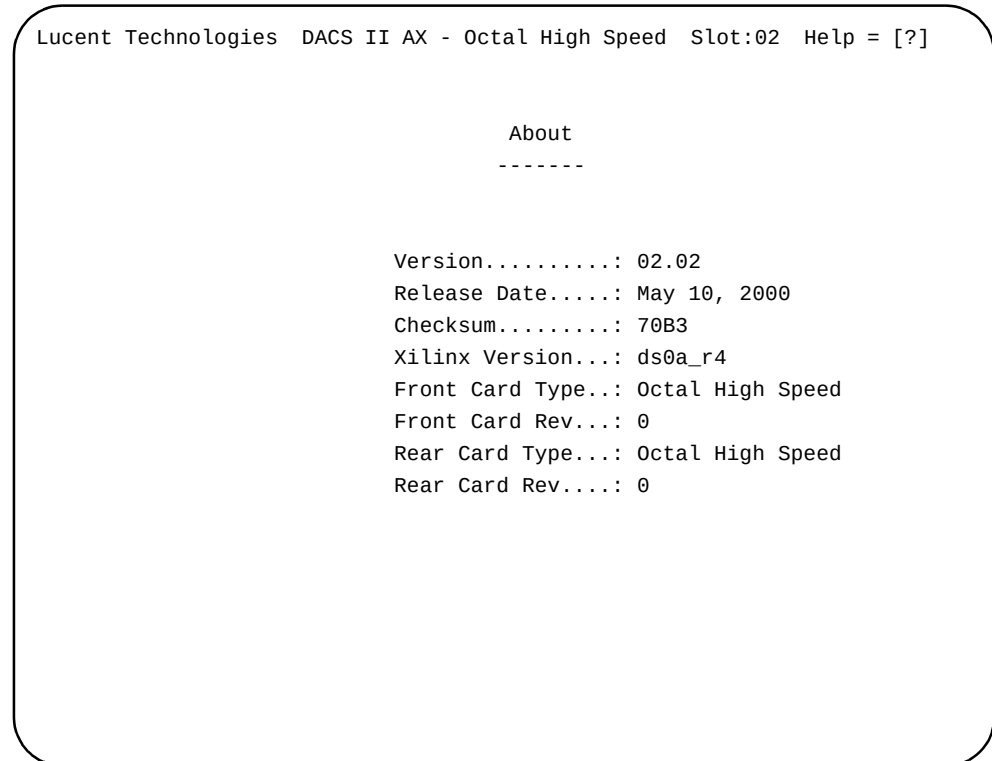
About Menu

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 About Menu displays.



```
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 19-27. 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 the module software release.

Checksum: Displays the sum of all bytes in the OHSD'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

■ Physical Description	20-9
■ Regulatory Information	20-10
FCC Information	20-10
Product Safety	20-10
Europe	20-10
■ Before You Begin	20-11
■ Configure Slot for the Router Module	20-12
Configure Slot	20-12
■ Main Menu	20-13
Access Router Module Main Menu	20-15
■ Configuration Menu	20-16
View Configuration	20-16
Modify Configuration	20-16

■ Router Module Configuration	20-17
Procedure	20-17
■ LAN Port Configuration	20-18
Procedure	20-18
LAN Configuration Field Descriptions	20-19
■ WAN Port Configuration	20-21
Procedure	20-21
WAN Configuration Field Descriptions	20-25
■ Logical Port Configuration	20-29
Procedure	20-29
Logical Port Configuration Field Descriptions	20-32
■ SNMP Agent Configuration	20-36
Procedure	20-36
■ SNMP Agent Configuration Field Descriptions	20-38
System Group Parameters	20-38
Trap Controls	20-38
Community Profiles	20-38
■ Alarm Contact Configuration	20-39
Procedure	20-39
Procedure - Configure User Alarms	20-41
User Alarms Configuration Field Descriptions	20-42
■ Bridge Address Table	20-43
Procedure	20-43
Bridge Address Configuration Field Descriptions	20-44
■ DHCP/Bootp Relay	20-45
Procedure	20-45
DHCP/BOOTP Relay Configuration Field Descriptions	20-46

■ IP and OSPF Configuration	<u>20-47</u>
Procedure	<u>20-47</u>
■ IP Route Table	<u>20-49</u>
Procedure	<u>20-49</u>
IP Route Table Field Descriptions	<u>20-50</u>
■ IP Multicast Group	<u>20-51</u>
Procedure	<u>20-51</u>
IP Multicast Group Configuration Field Descriptions	<u>20-52</u>
■ Additional Information on IP Multicast Groups	<u>20-53</u>
■ IP Route Filters Configuration	<u>20-54</u>
Procedure	<u>20-54</u>
IP Route Filters Field Descriptions	<u>20-56</u>
■ IP Filter Configuration	<u>20-57</u>
Procedure - Configure IP Filter for Logical Port	<u>20-58</u>
Procedure - Set IP Address for Syslog Messages	<u>20-62</u>
Single Rule Configuration Submenu Field Descriptions	<u>20-63</u>
■ IP Secondary Address Configuration	<u>20-65</u>
Procedure - Configure Secondary IP Addresses	<u>20-65</u>
IP Secondary Address Field Descriptions	<u>20-67</u>
■ Special Instructions for Router-to-Router Configuration using Secondary Addressing	<u>20-68</u>
■ IP Network Address Translation	<u>20-69</u>
Procedure	<u>20-69</u>
Network Address Translation Field Descriptions	<u>20-70</u>
■ Network Address Translation Entry	<u>20-71</u>
Procedure	<u>20-71</u>
Procedure - Delete an Entry	<u>20-72</u>
Network Address Translation Entry Field Descriptions	<u>20-72</u>

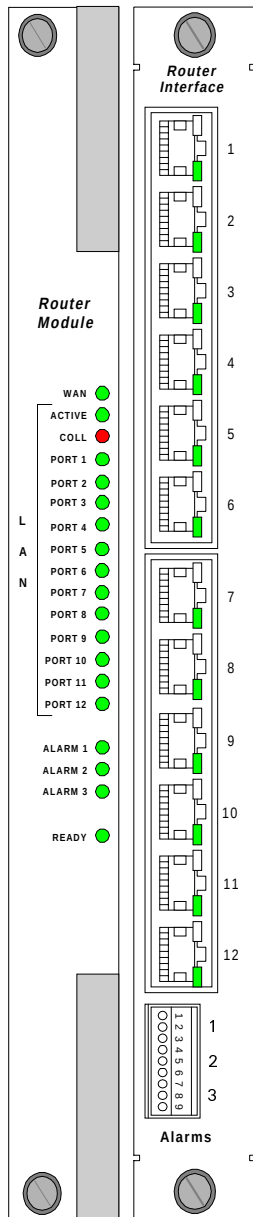
■ OSPF Protocol	20-74
■ OSPF Areas	20-76
Procedure	20-77
■ OSPF Area Configuration Entry Field Descriptions	20-80
■ OSPF Circuits	20-81
Procedure - Configure OSPF Circuits	20-81
OSPF Circuit Configuration Field Descriptions	20-83
■ OSPF Virtual Links	20-85
Procedure - Configure OSPF Virtual Links	20-85
OSPF Virtual Links Configuration Field Descriptions	20-87
■ OSPF Ranges Configuration	20-88
Procedure	20-88
OSPF Ranges Configuration Field Descriptions	20-90
■ OSPF Route Filters	20-91
Procedure - OSPF Route Filters	20-91
OSPF Route Filters Configuration Field Descriptions	20-93
■ RIP Route Filters	20-94
Procedure - RIP Route Filters	20-94
RIP Route Filter Configuration Field Descriptions	20-96
■ RIP 2	20-97
Procedure - Configure RIP 2	20-97
RIP Route Filter Configuration Field Descriptions	20-98
■ IPX SAP Filters	20-99
Procedure - Configure IPX SAP Filter	20-99
Procedure - Configure New IPX SAP Filter	20-100
Procedure - Configure Saved IPX SAP Filter	20-102
Procedure -Erase IPX SAP Filter	20-102
Procedure - Configure Single Rule	20-102
IPX SAP Filter Single Rule Configuration Field Descriptions	20-103

■ DHCP Server	20-104
Procedure - Configure DHCP Server	20-105
Before You Begin	20-105
Procedure - DHCP Dynamic Configuration	20-106
DHCP Server Pool Configuration Field Descriptions	20-108
Procedure - DHCP Static Configuration	20-109
DHCP Server Pool Configuration Field Descriptions	20-111
Procedure - View DHCP Pool Statistics	20-112
DHCP Pool Statistics Display Field Descriptions	20-114
Procedure - View DHCP Used IP Statistics	20-115
DHCP Used IP Statistics Display Field Descriptions	20-116
Procedure - Enable DHCP and Set Up Options	20-117
DHCP Option Field Descriptions	20-118
Procedure - NetBios Scope	20-119
Procedure - NetBios Name Server	20-120
■ Statistics Menu	20-121
Procedure	20-121
■ Physical Port Statistics	20-122
Procedure	20-122
■ Physical Port Statistics Display Field Descriptions	20-123
LAN Port Status Parameters	20-123
WAN Port Status Parameters	20-123
■ Logical Port Status	20-125
Procedure	20-125
Logical Port Status Field Descriptions	20-126

■ Frame Relay DLCI Statistics	<u>20-127</u>
Procedure	<u>20-127</u>
Frame Relay DLCI Statistics Field Descriptions	<u>20-128</u>
■ Router Utilities Menu	<u>20-129</u>
Procedure	<u>20-130</u>
■ LAN Commands - Bridge Address Table	<u>20-131</u>
Procedure	<u>20-131</u>
Bridge Address Table Field Descriptions	<u>20-132</u>
■ LAN Commands - Spanning Tree Status	<u>20-133</u>
Procedure	<u>20-133</u>
Spanning Tree Information Display Field Descriptions	<u>20-134</u>
■ WAN Commands - Frame Relay Status	<u>20-135</u>
Procedure	<u>20-135</u>
Frame Relay Status Utility Field Descriptions	<u>20-136</u>
■ WAN Commands - PPP Status	<u>20-140</u>
Procedure	<u>20-140</u>
PPP Port Status Display Field Descriptions	<u>20-141</u>
■ IP Commands - Ping	<u>20-143</u>
Procedure	<u>20-143</u>
■ IP Commands - Telnet Client	<u>20-145</u>
Procedure	<u>20-145</u>
■ IP Commands - IP Route Table	<u>20-146</u>
Procedure	<u>20-146</u>
Procedure	<u>20-147</u>
Show IP Route Field Descriptions	<u>20-148</u>
Procedure	<u>20-149</u>
IP Route Table Display Field Descriptions	<u>20-150</u>

■ IP Commands - ARP Table	<u>20-151</u>
Procedure	<u>20-151</u>
ARP Table Display Field Descriptions	<u>20-152</u>
■ IP Commands - MIB Table	<u>20-153</u>
Procedure	<u>20-153</u>
■ IP Commands - Trace IP	<u>20-154</u>
Procedure	<u>20-154</u>
■ IPX Commands - IPX RIP Table	<u>20-155</u>
Procedure	<u>20-155</u>
■ IPX Router RIP Information Table Display Field Descriptions	<u>20-156</u>
■ IPX Commands - IPX SAP Table	<u>20-158</u>
Procedure	<u>20-158</u>
■ IPX SAP Server Information Table Display Field Descriptions	<u>20-159</u>
■ IPX Commands - Trace IPX	<u>20-160</u>
Procedure	<u>20-160</u>
■ IPX Commands - SAP Filtering Stats	<u>20-161</u>
Procedure	<u>20-161</u>
SAP Filtering Stats Utility Field Descriptions	<u>20-161</u>
■ Utilities Menu	<u>20-162</u>
Procedure	<u>20-163</u>
Procedure - Reset Router Module	<u>20-163</u>
Procedure - Put Port In Service/Out-of-Service	<u>20-164</u>
■ About Menu	<u>20-165</u>
Procedure	<u>20-165</u>
About Display Field Descriptions	<u>20-166</u>

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 application module and rear interface must be resident in a slot in the equipment chassis.
 - 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.
-

Configure Slot for the Router Module

Configure Slot Configure a slot for the Router module. Refer to Configuring a Slot: page 4-8.

Main Menu

The Channelized Router Hub's *Main Menu* is accessed from the *Node Summary Menu*. The menu structure is shown in [Figure 20-1](#).

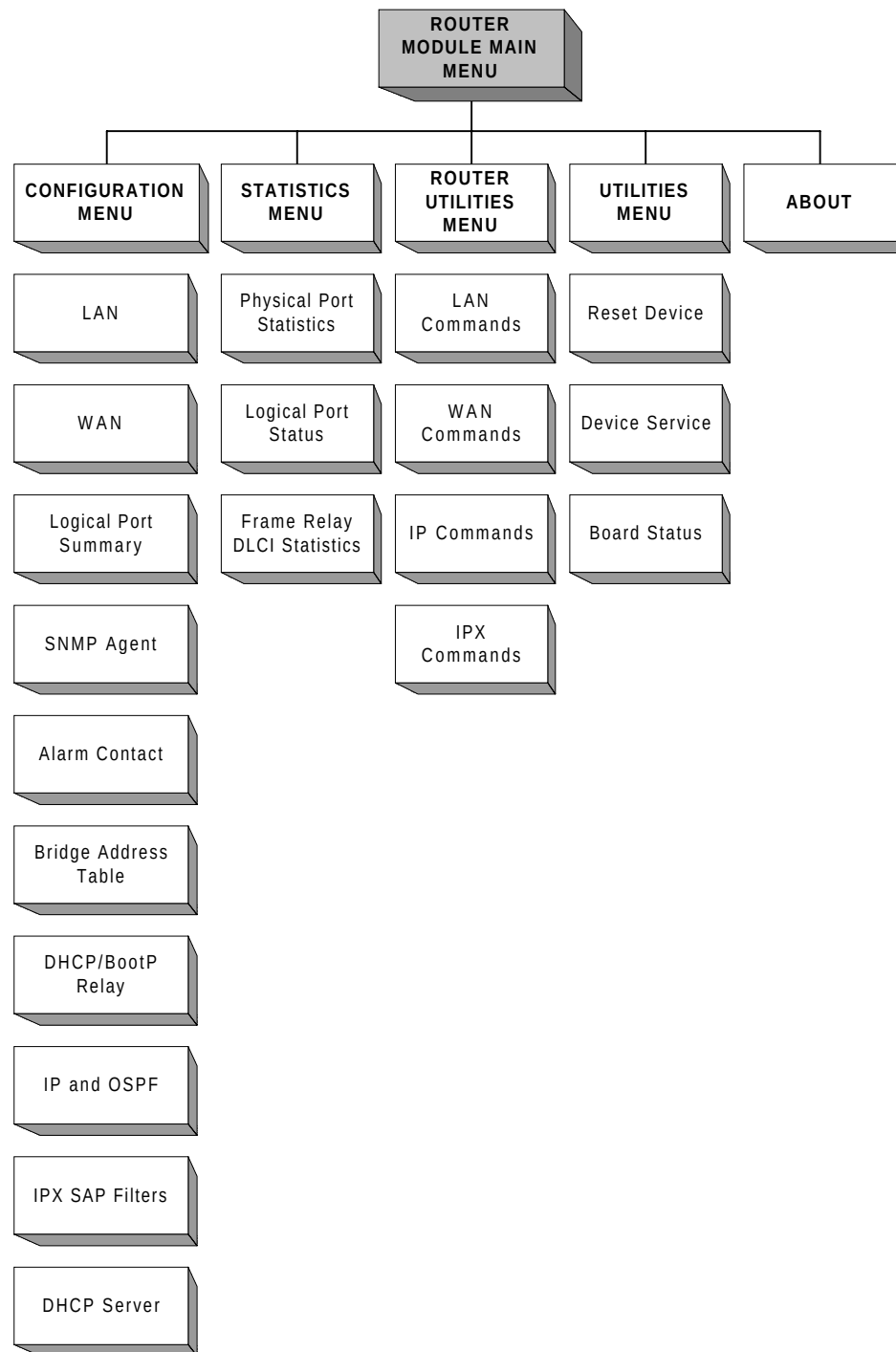


Figure 20-1. Router Module Menu Structure

Access Router Module Main Menu

To access the Router Module Main Menu:

1. From the *DACS II AX Main Menu*, select *Node Summary*.
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.

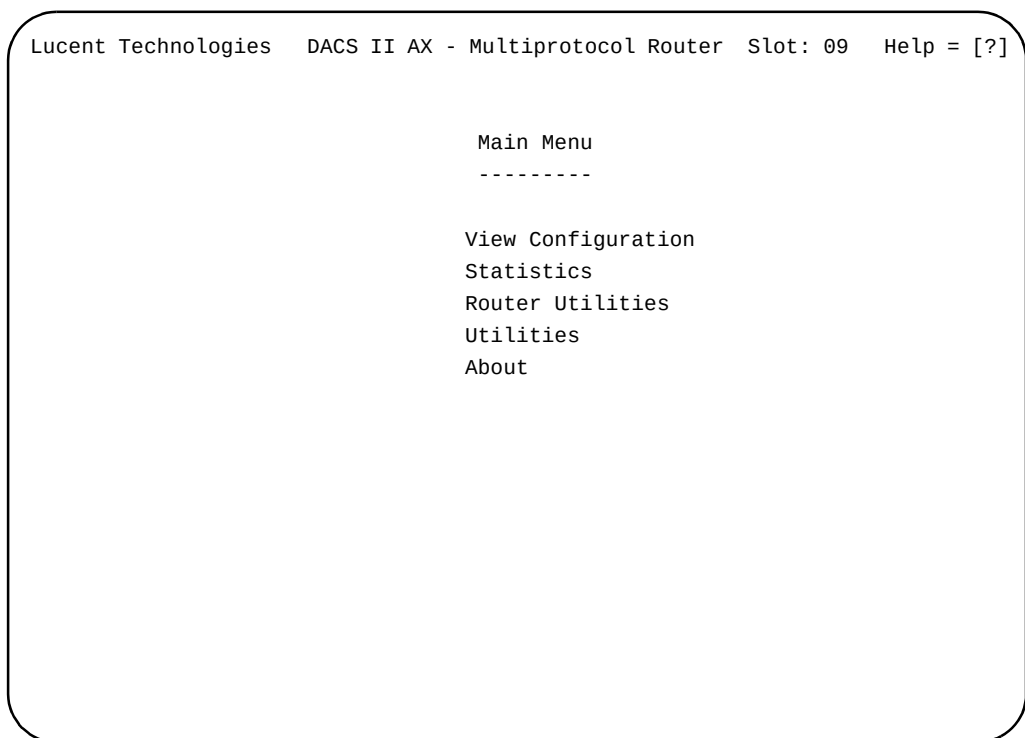


Figure 20-2. Router Main Menu

From the *Main Menu* you can display the Channelized Router Hub configuration, 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 20-3](#).

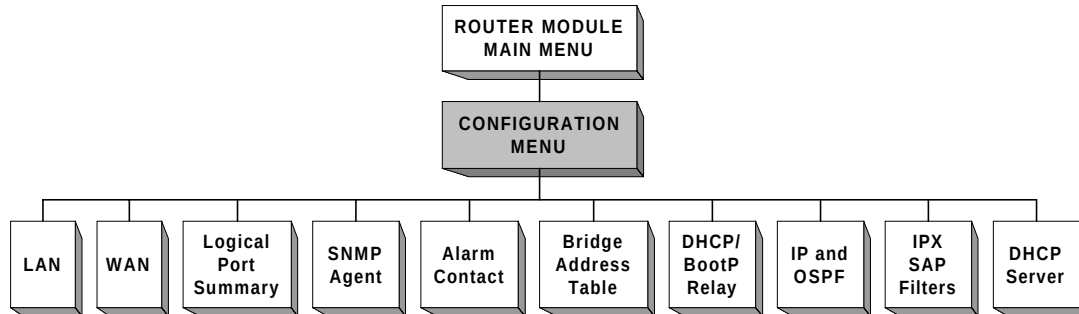


Figure 20-3. Configuration Menu Structure

View Configuration

To display the router configuration, from the *DACS II AX Main Menu*, select *Node Summary*. Place your cursor on the slot number where the Router Module is located and press **<Enter>**. The Router Module's *Main Menu* appears. Select *View Configuration*. When the Configuration menu is accessed this way, it provides access to displays of the configuration information.

Modify Configuration

To configure the router, go to the Node Summary menu, move the cursor to the slot where the router is and press **P** for **[P]ort/Link Cfg**. The following sections provide configuration procedures and descriptions on the fields.

Router Module Configuration

Procedure

To configure the Router Module:

1. From the *DACS II AX Main Menu* you can do one of the following:
 - Select *System Configuration*, then select *Slot Configuration*. Move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

The Configuration Menu displays ([Figure 20-4](#)).

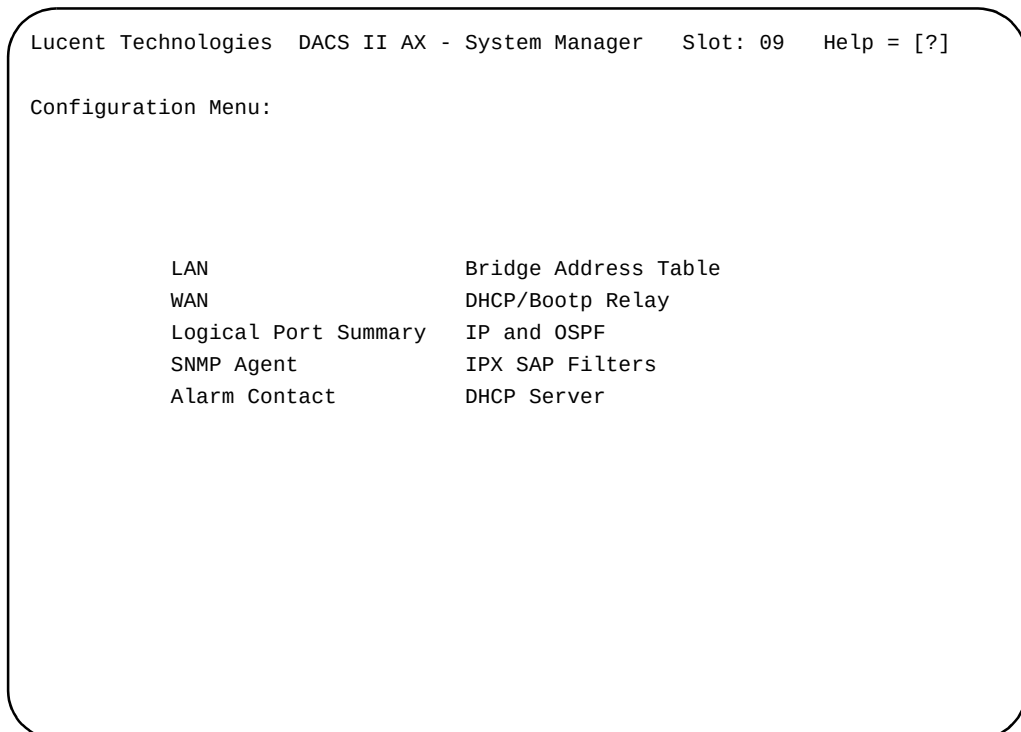


Figure 20-4. Configuration Menu

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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. From the *Configuration Menu*, place your cursor on the *LAN* field and press **<Enter>**. The following submenu appears:

```

Lucent Technologies   DACS II AX - System Manager   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 20-5. LAN Configuration Submenu

3. Configure LAN 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 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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. From the *Configuration Menu*, place your cursor on the *WAN* field and press **<Enter>**. The following submenu appears:

```

Lucent Technologies  DACS II AX - System Manager  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 20-6. WAN Configuration Submenu (Time Slot Allocation)

3. 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.
4. 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).

5. Move your cursor to each timeslot and press **<Enter>** to select the virtual WAN port for the timeslot.

6. 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 - System Manager 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 20-7. WAN Virtual Port Configuration Submenu (WAN 1)

This submenu allows Frame Relay parameters to be configured.

7. If you are configuring WAN 2-32, the following submenu appears when **C** is pressed:

```
Lucent Technologies  DACS II AX - System Manager  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 20-8. WAN Virtual Port Configuration Submenu (WAN 2-32)

This submenu does NOT allow Frame Relay configuration.

8. 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

9. 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.
10. 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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.**
2. 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 - System Manager

Slot: 09

Help = [?]

Logical port summary menu...

Page 1 of 5

Port	DLCI	BSIXC	Port	DLCI	BSIXC	Port	DLCI	BSIXC
LAN		--I--	WAN 16	16	--I--	n/a		-----
WAN 1	16	--IX-	WAN 17	16	--I--	n/a		-----
WAN 2	16	--I--	WAN 18	16	--I--	n/a		-----
WAN 3	16	--I--	WAN 19	16	--I--	n/a		-----
WAN 4	16	--I--	WAN 20	16	--I--	n/a		-----
WAN 5	16	--I--	WAN 21	16	--I--	n/a		-----
WAN 6	16	--I--	WAN 22	16	--I--	n/a		-----
WAN 7	16	--I--	WAN 23	16	--I--	n/a		-----
WAN 8	16	--I--	WAN 24	16	--I--	n/a		-----
WAN 9	16	--I--	n/a		-----	n/a		-----
WAN 10	16	--I--	n/a		-----	n/a		-----
WAN 11	16	--I--	n/a		-----	n/a		-----
WAN 12	16	--I--	n/a		-----	n/a		-----
WAN 13	16	--I--	n/a		-----	n/a		-----
WAN 14	16	--I--	n/a		-----	n/a		-----
WAN 15	16	--I--	n/a		-----	n/a		-----

Page next/prev = ['+'/'-']

Figure 20-9. Logical Port Summary Submenu

3. 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 - System Manager      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 20-10. Logical Port Parameters Submenu

4. Select logical port parameters from here. Refer to the field descriptions on the following pages.
5. 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.

6. 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 - System Manager  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 20-11. 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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.

2. From the *Router Configuration Menu*, place your cursor on the *SNMP Agent* field and press <Enter>. The following submenu appears:

Lucent Technologies DACS II AX - System Manager 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...
(used for trap destinations)

Community profiles...

		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 20-12. SNMP Agent Configuration Submenu

3. Select SNMP Agent 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 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.

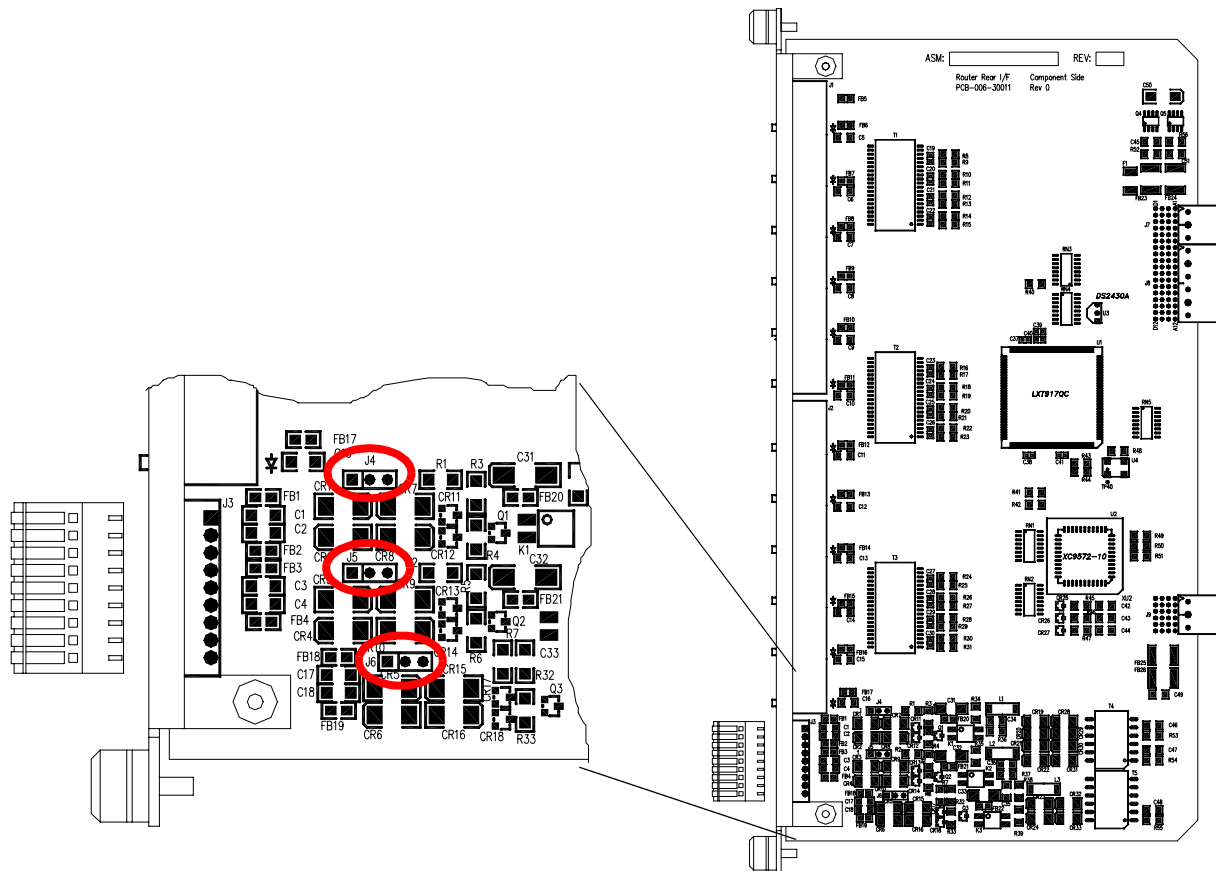


Figure 20-13. Alarm Jumper Location

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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. From the Router Configuration Menu, place your cursor on the *Alarm Contact* field and press **<Enter>**. The following submenu appears:

```
Lucent Technologies  DACS II AX - System Manager      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 20-14. User Alarms Configuration Submenu

3. From this submenu, the user alarms can be enabled or disabled, and their status is displayed. Refer to the field descriptions that follow.

4. 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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. 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 - Sytem Manager 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
0:0:0:0:0:0	LAN	16	0:0:0:0:0:0	LAN	16

Figure 20-15. Bridge Address Configuration Menu

3. Configure the Bridge Addresses 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 *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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. 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 - System Manager  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 20-16. DHCP/Bootp Relay Configuration Submenu

3. Configure the DHCP/Bootp Relay parameters 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 *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:

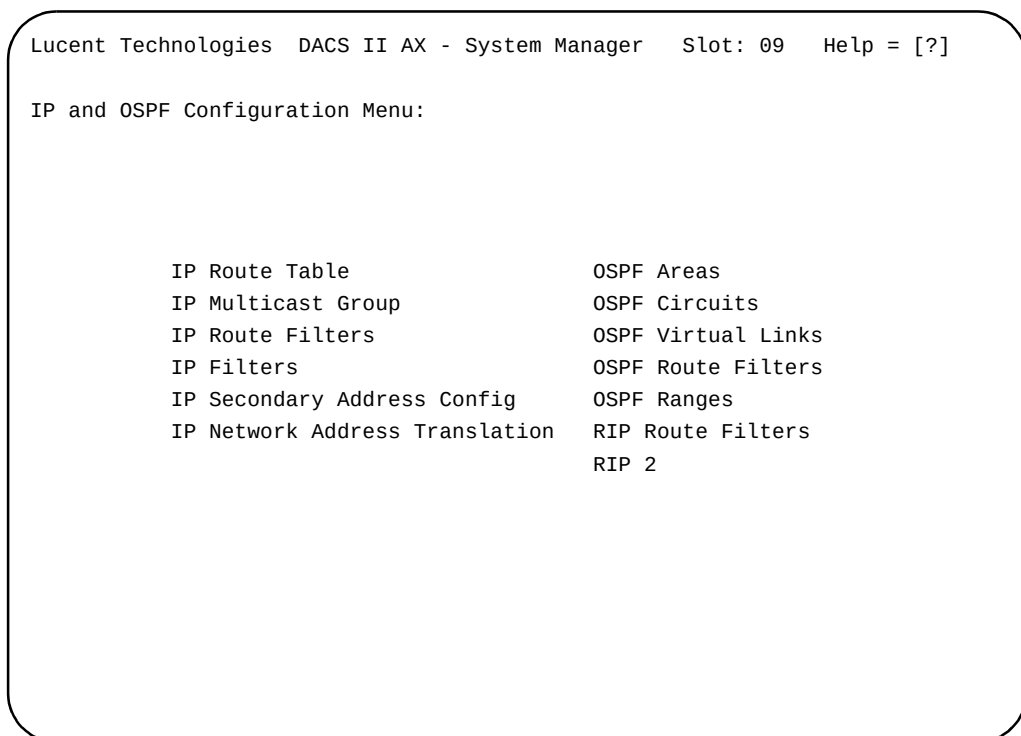


Figure 20-17. IP and OSPF Configuration Submenu

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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. 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 - System Manager 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
		Page next/prev = ['+'/'-']	
		Entry up/down = ['u'/'d']	
		Entry insert/erase = ['i'/'e']	

Figure 20-18. IP Route Table Configuration Submenu

3. Configure the IP Route Table 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 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 *DACS II AX Main Menu*, select *Node Summary*, then move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
2. 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 - System Manager  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 20-19. IP Multicast Group Configuration Submenu

3. Configure the IP Multicast Group 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 *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.

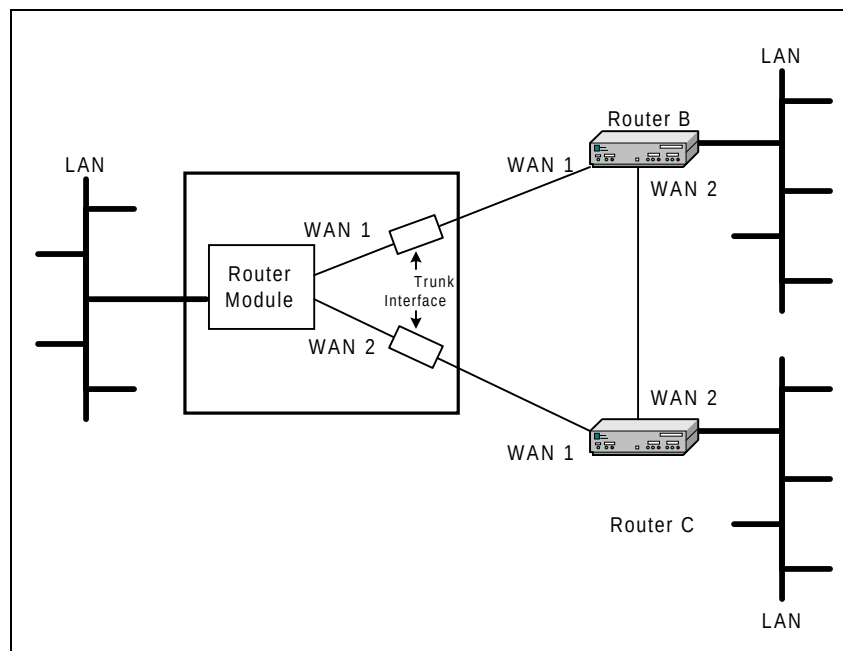


Figure 20-20. Depiction of an IP Multicast Group

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 - System Manager 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 20-21. 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 - System Manager Slot: 09 Help = [?]

IP address.....: 0.0.0.0
Network mask.....: 0.0.0.0
OSPF.....: No
RIP.....: No

Figure 20-22. 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 - System Manager 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 20-23. 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 - System Manager   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 20-24. 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 - System Manager   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 20-25. 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 - System Manager 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 20-26. 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.
-

Procedure - 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:

Figure 20-27. 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 20-28. 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 20-68](#) 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:

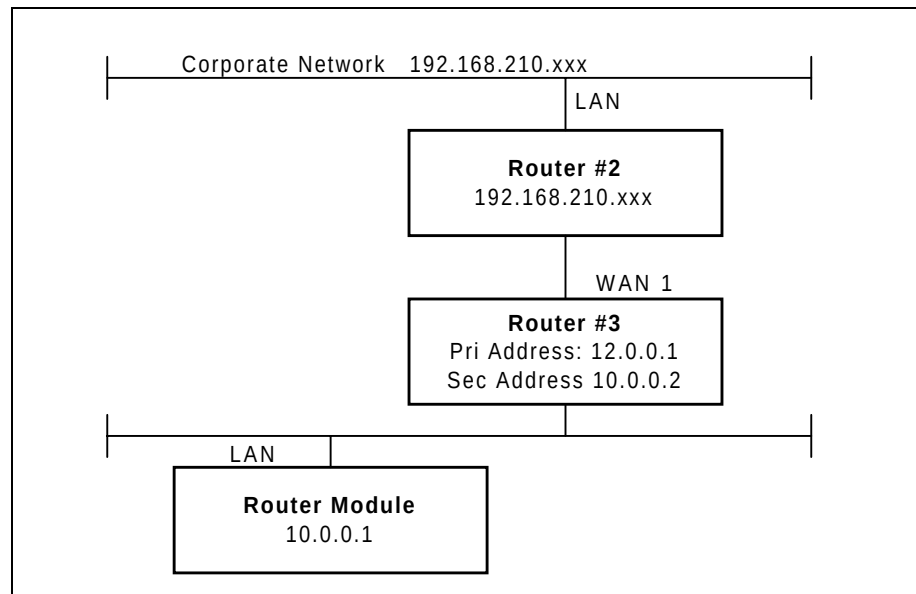


Figure 20-29. Sample Router-to-Router Configuration with Multiple Homing

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 - System Manager
 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 20-30. 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 - System Manager 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 20-31. 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 20-32](#) is followed by a basic explanation of how OSPF functions for the configuration shown in the figure.

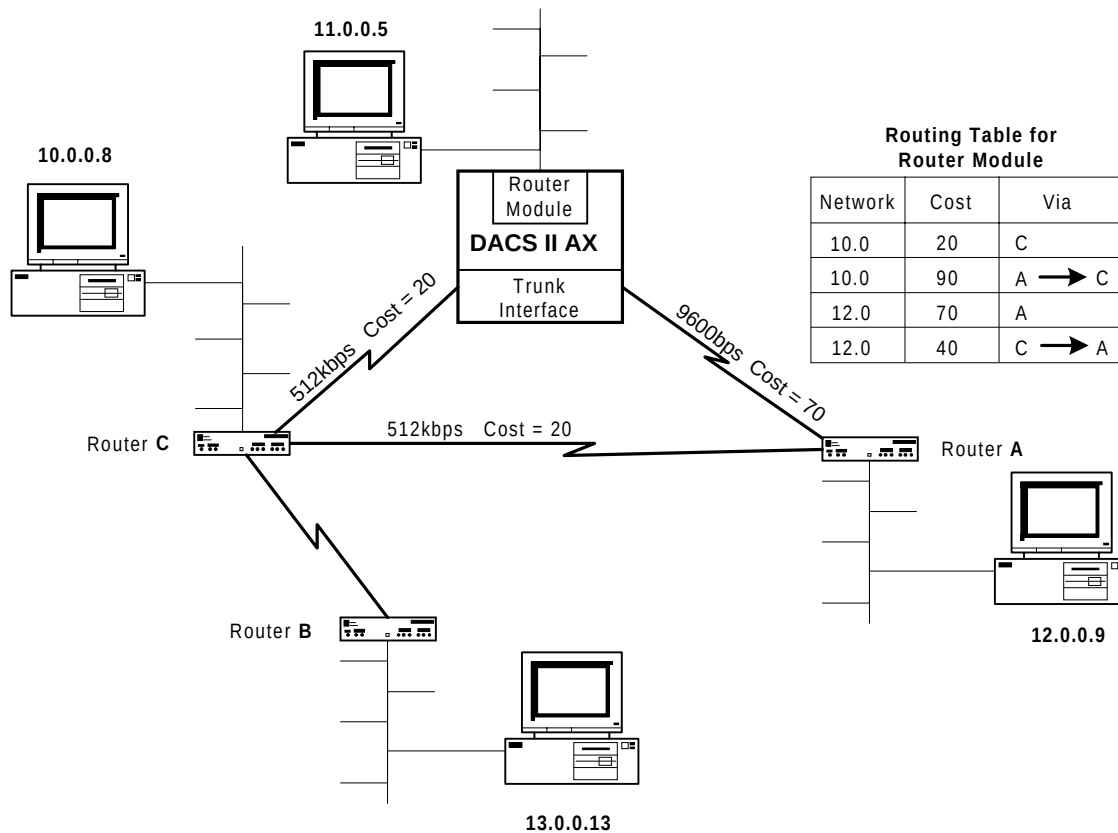


Figure 20-32. OSPF Protocol

In the example shown in the [Figure 20-32](#), 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.

Procedure

To configure OSPF Areas:

1. From the *IP and OSPF Configuration* submenu, place your cursor on the *OSPF Areas* field and press **<Enter>**. The following submenu appears:

Lucent Technologies DACS II AX - System Manager Slot: 09 Help = [?]

OSPF Areas Configuration Menu:

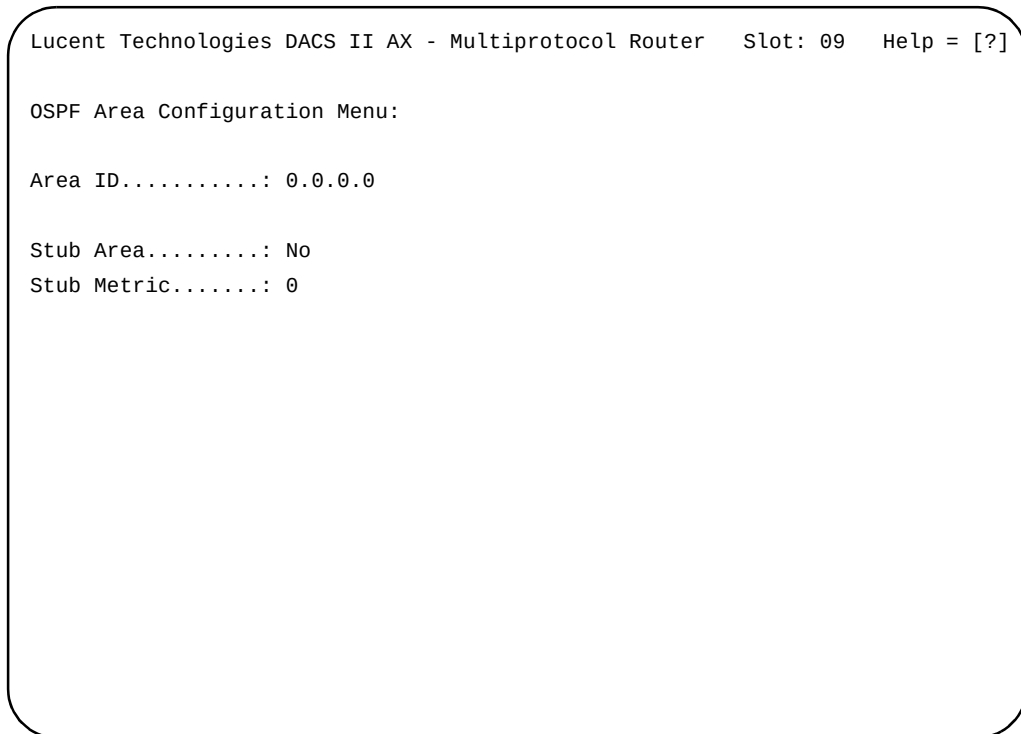
Area ID	Stub Area	Stub Metric
0.0.0.0	No	0
0.0.0.0	No	0
0.0.0.0	No	0

Page next/prev = ['+'/'-']
Entry up/down = ['u'/'d']
Entry insert/erase = ['i'/'e']

Figure 20-33. 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:



The screenshot shows a terminal window with the following text:

```
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 20-34. 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 20-35. 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 20-36. 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 20-37. 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:

```
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 20-38. 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

Figure 20-39. 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 20-40. 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 20-41. 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 20-42. 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 20-43. 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 20-44. 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.

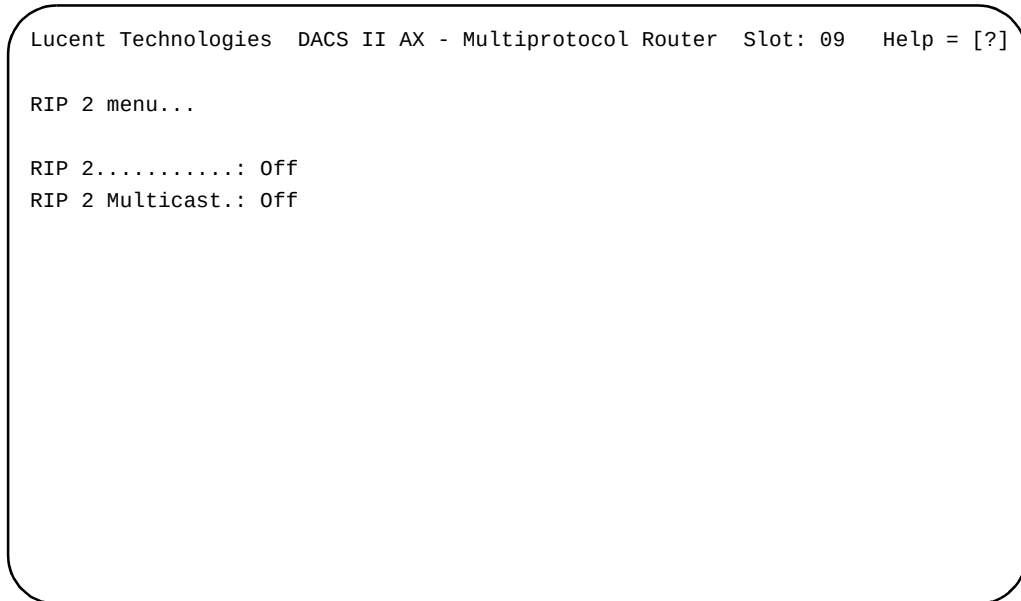
RIP 2

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:

A screenshot of a terminal window showing the configuration interface for a Lucent Technologies DACS II AX Multiprotocol Router. The title bar at the top reads 'Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]'. The main content area displays the 'RIP 2 menu...' with two options: 'RIP 2.....: Off' and 'RIP 2 Multicast.: Off'.

```
Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]  
  
RIP 2 menu...  
  
RIP 2.....: Off  
RIP 2 Multicast.: Off
```

Figure 20-45. 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 20-46. 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 20-47. 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 20-48. 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:

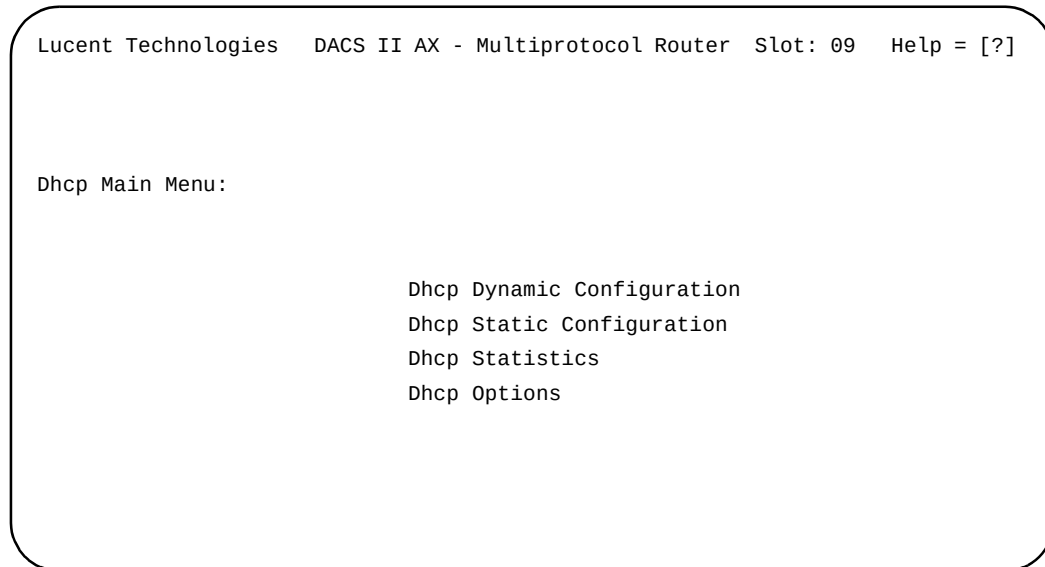


Figure 20-49. DHCP Main Menu

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 20-50. 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 20-51. 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

                                     Page next/prev =  ['+'/'-']

```

Figure 20-52. 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 20-53. 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:

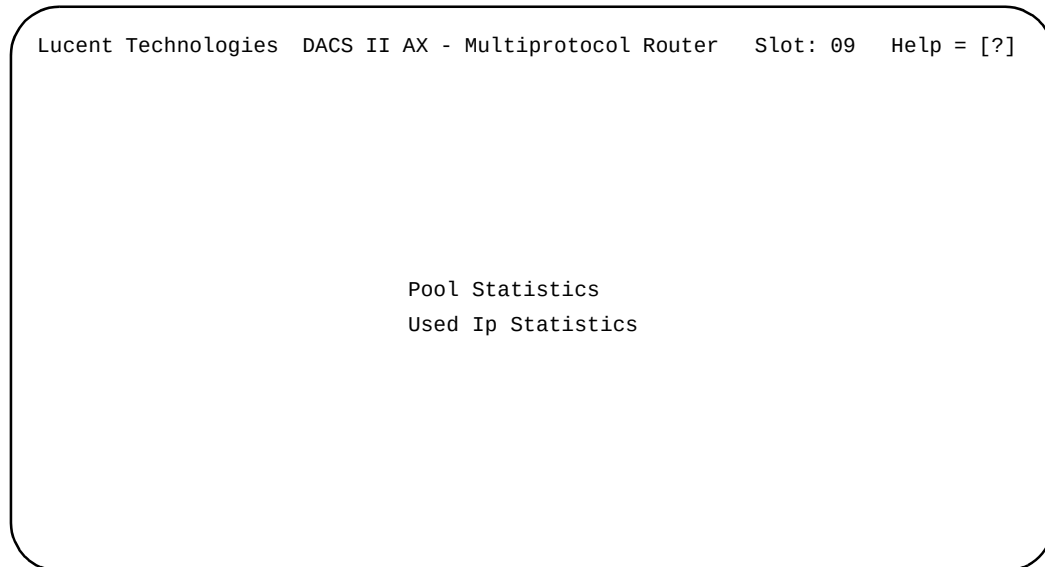


Figure 20-54. DHCP Statistics Submenu

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 20-55. 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 20-56. 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.

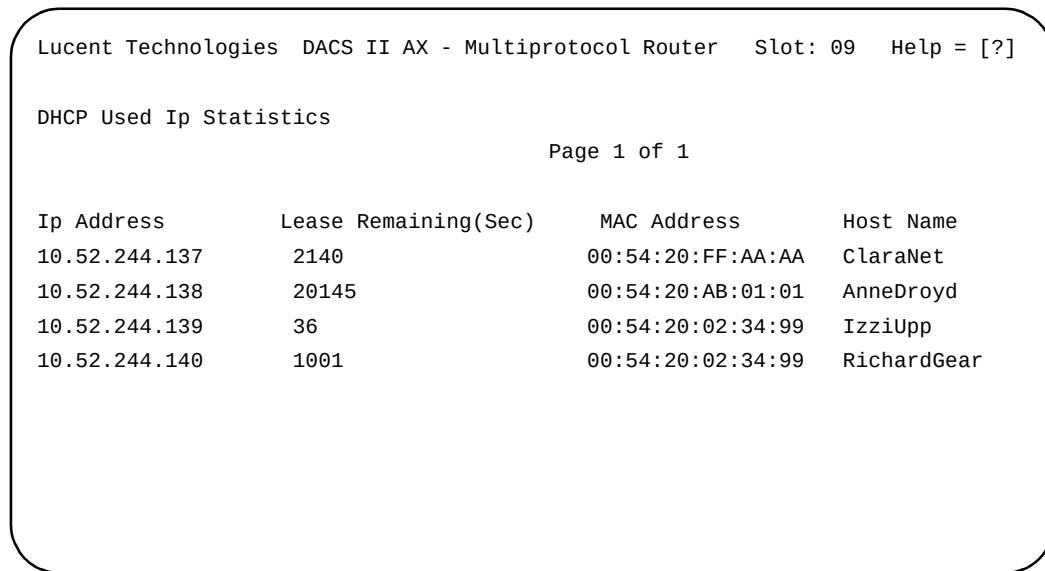
Total: This field displays the total number of addresses in the Dynamic Address Pool.

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 20-57. 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.

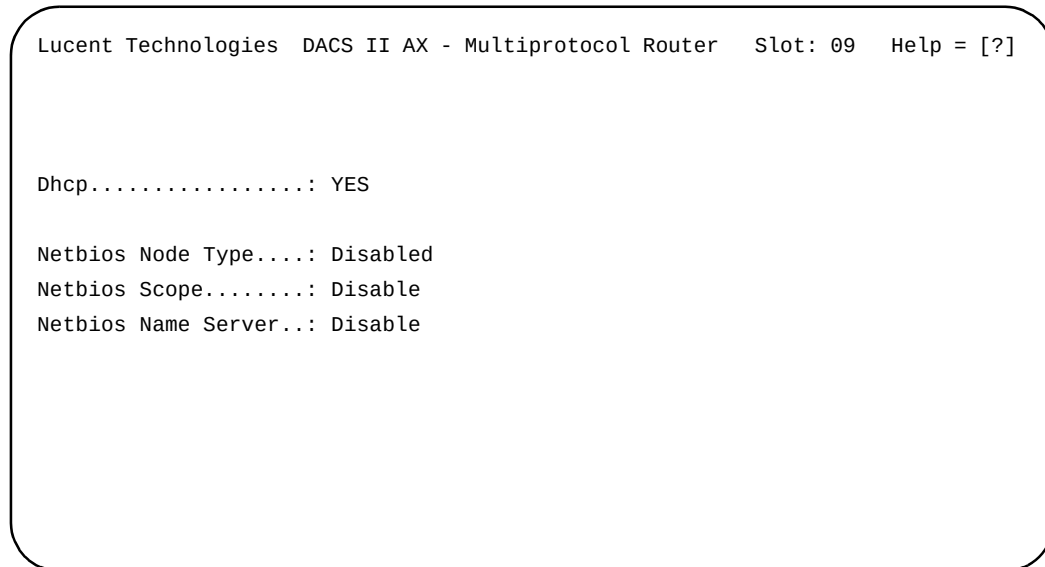
MAC Address: This field displays the MAC address of the interfacing equipment.

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:

A screenshot of a terminal window showing the DHCP Options Submenu. The window title is "Lucent Technologies DACS II AX - Multiprotocol Router Slot: 09 Help = [?]". The menu content is as follows:

```
Dhcp.....: YES

Netbios Node Type....: Disabled
Netbios Scope.....: Disable
Netbios Name Server...: Disable
```

Figure 20-58. 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.

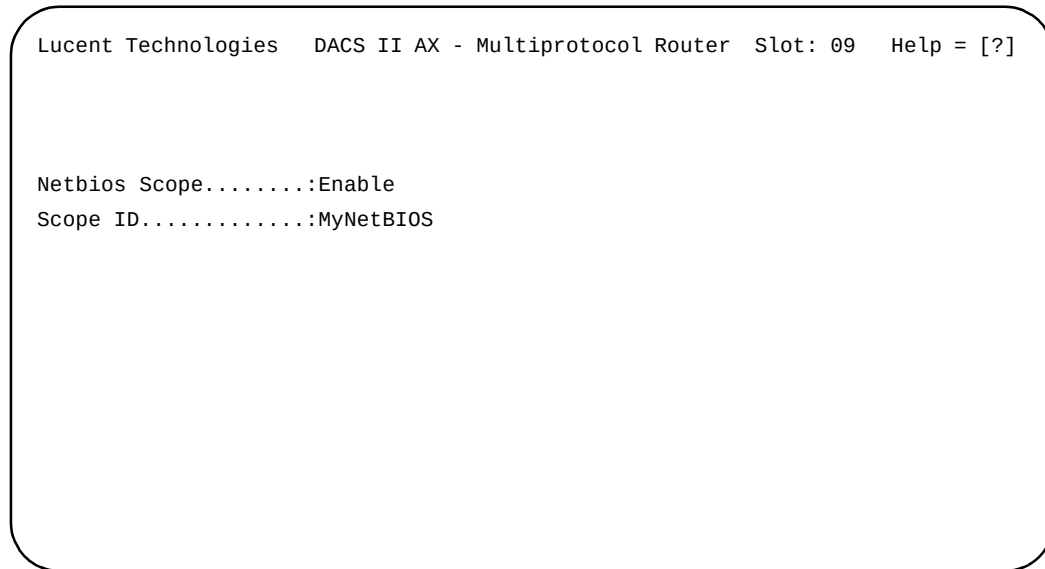
Netbios Scope: (*option field*) Enables you to *Enable* or *Disable* NetBios Scope, as well as assign a name to the population of computers on the network. See the Enable and Configure NetBios Scope procedure on the following page.

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:



```
Lucent Technologies   DACS II AX - Multiprotocol Router   Slot: 09   Help = [?]  
  
Netbios Scope.....:Enable  
Scope ID.....:MyNetBIOS
```

Figure 20-59. 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 20-60. 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.

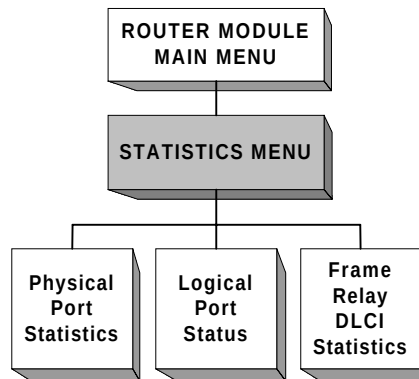


Figure 20-61. Statistics Menu Structure

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 20-62](#)).

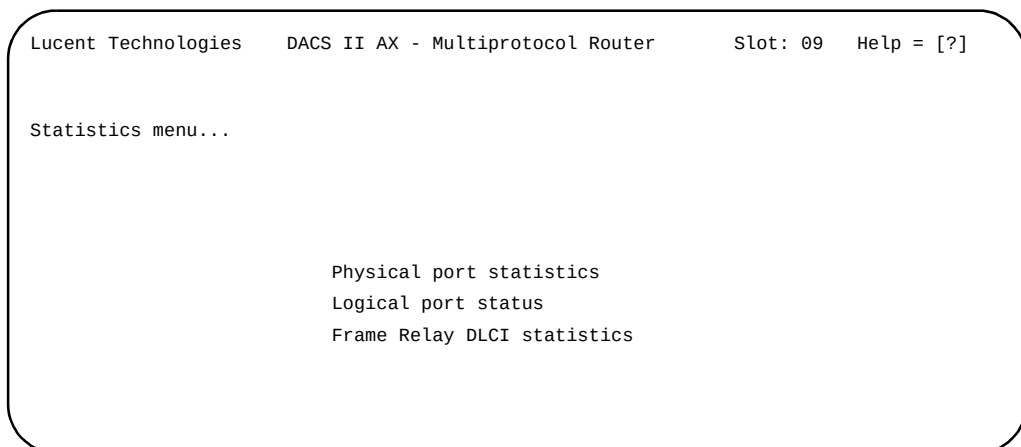


Figure 20-62. Statistics Menu

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 20-63. 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 20-64. 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).

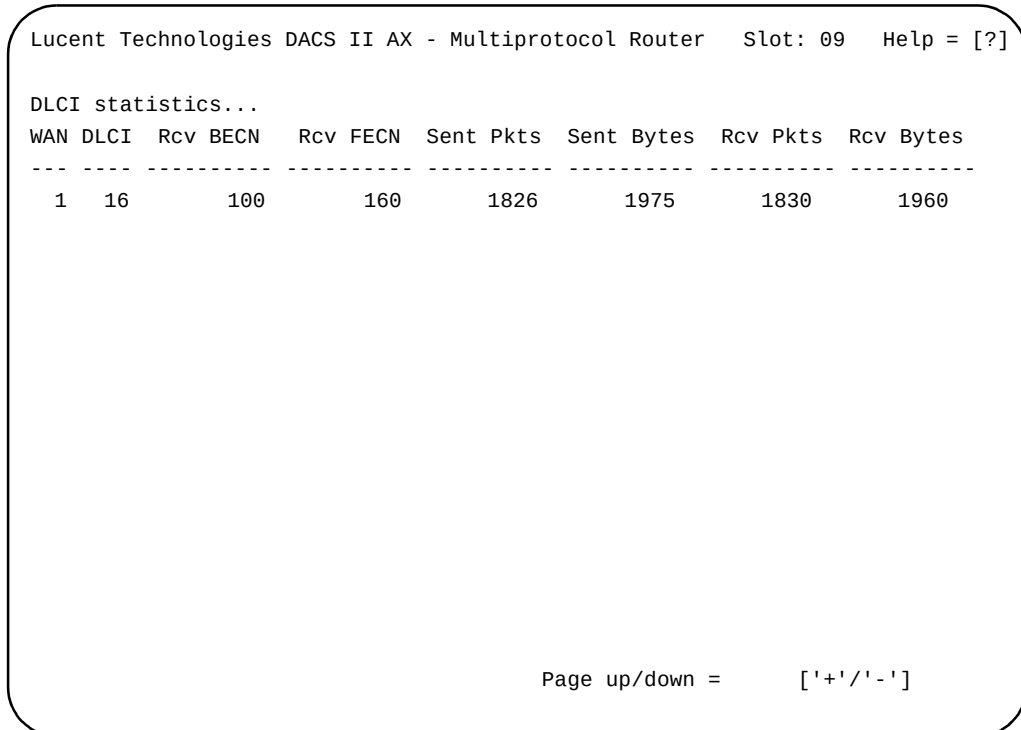
Frame Relay DLCI Statistics

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 20-65. 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.

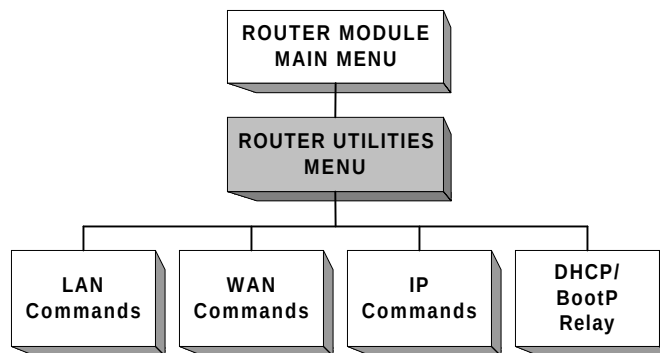


Figure 20-66. Router Utilities Menu Structure

Procedure

To Access the Router Utilities Menu:

1. From the *Main Menu*, select *Router Utilities*. The Router Utilities Menu displays ([Figure 20-67](#)).



Figure 20-67. 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 20-68. 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 20-69. 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...: [1,1,1,1,1,1,1,1,1,0,0,0,1,1,0,0]
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, 1100, 0101, 0
101, 0101, 1100, 0101, 0101, 0101, 0101, 1100,

Press any key to continue...
```

Figure 20-70. 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)

Code	Description
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 20-71. 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 20-72. 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).

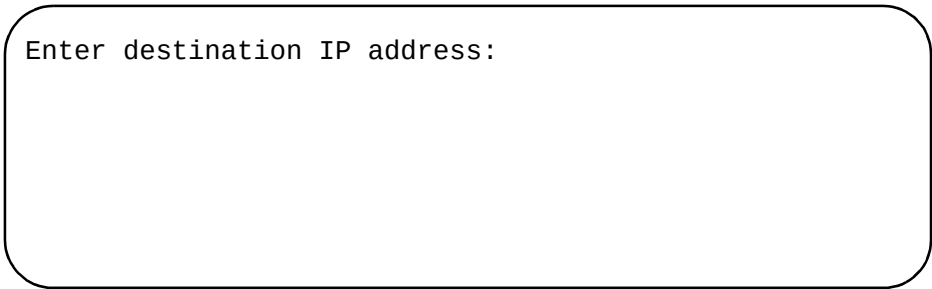
IP Commands - Telnet Client

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 20-73. 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 20-74. 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 20-75. 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 20-76. 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 20-77. 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 20-78. 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 20-79. 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 20-80. 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 20-81. 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 20-82. 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 20-83. 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.

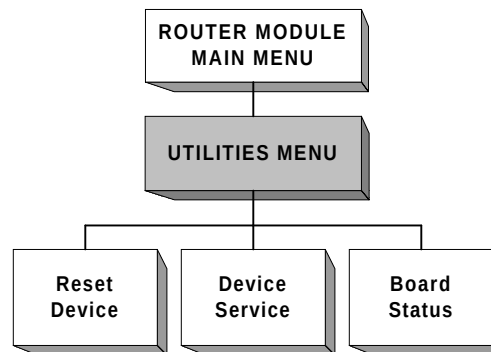


Figure 20-84. Utilities Menu Structure

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:

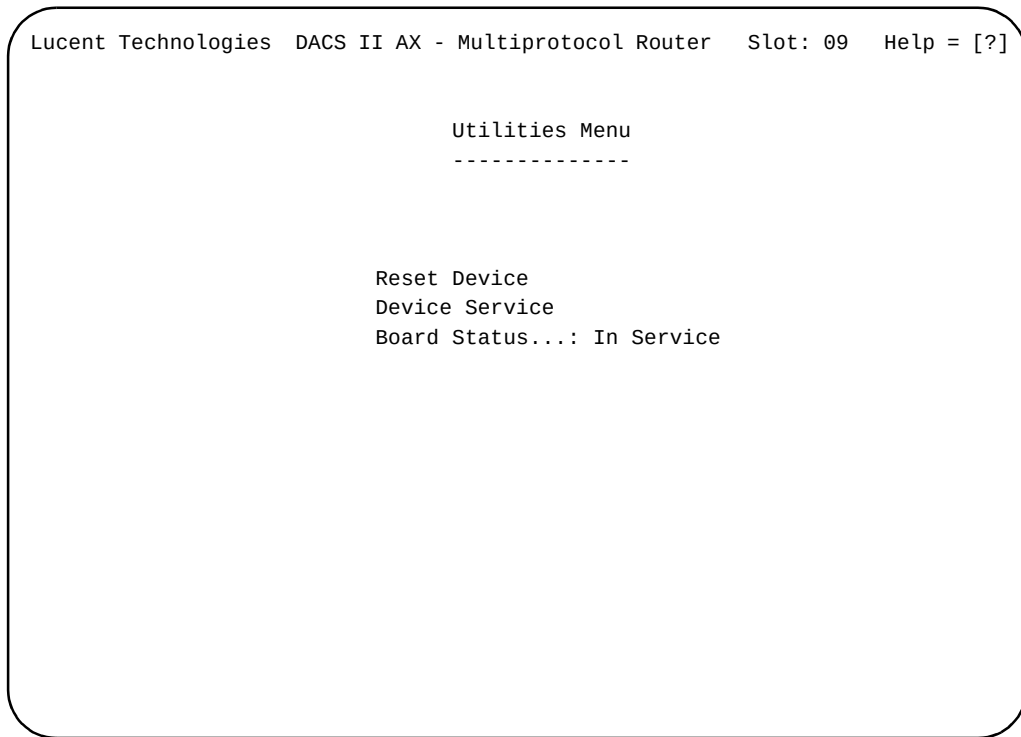


Figure 20-85. Utilities Menu

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 20-86. 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.

Contents

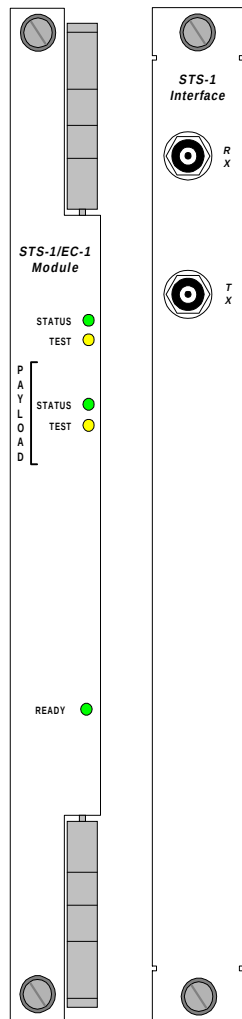
■ Physical Description	<u>21-5</u>
■ LED Descriptions	<u>21-6</u>
STATUS - Mapper	<u>21-6</u>
TEST - Mapper	<u>21-6</u>
STATUS - Payload	<u>21-6</u>
TEST - Payload	<u>21-6</u>
READY	<u>21-7</u>
■ Regulatory Information	<u>21-8</u>
North America	<u>21-8</u>
Product Safety	<u>21-8</u>
Europe	<u>21-8</u>
■ Before You Begin	<u>21-9</u>
Notes about the STS-1 Module	<u>21-9</u>
■ Configure Slot for STS-1 Module	<u>21-10</u>
Configure Slot	<u>21-10</u>
■ Configure STS-1 Module	<u>21-11</u>
Purpose	<u>21-11</u>
Procedure	<u>21-11</u>
■ STS-1 Configuration	<u>21-13</u>

Mapping T1/E1 links into SONET Virtual Tributaries	<u>21-13</u>
Before You Begin	<u>21-14</u>
Configure VTs	<u>21-15</u>
STS-1 Configuration	
Field Descriptions	<u>21-16</u>
■ T1/E1 Link Configuration	<u>21-17</u>
Configure T1 Links	<u>21-17</u>
Link Configuration Field Descriptions	<u>21-19</u>
■ Main Menu	<u>21-21</u>
Access STS-1 Main Menu	<u>21-21</u>
■ View Configuration	<u>21-22</u>
Purpose	<u>21-22</u>
Related Task	<u>21-22</u>
Procedure	<u>21-22</u>
■ Diagnostics	<u>21-25</u>
Overview	<u>21-25</u>
Before You Begin	<u>21-25</u>
Access Diagnostics Menu	<u>21-25</u>
Diagnostics Menu Options	<u>21-26</u>
■ Line Diagnostics	<u>21-27</u>
Perform Line Diagnostics	<u>21-27</u>
Clear Counters	<u>21-27</u>
Diagnostics Manager Field Descriptions	<u>21-28</u>
Diagnostics Manager Commands	<u>21-30</u>
■ BERT (Bit Error Rate Test)	<u>21-31</u>
Overview	<u>21-31</u>
Before You Begin	<u>21-31</u>
Start BERT on a Link	<u>21-31</u>
Stop BERT for a Link	<u>21-34</u>
Start LIU BERT	<u>21-34</u>
Stop LIU BERT	<u>21-35</u>
View Status of T1/E1 Links	<u>21-36</u>
T1/E1 Link Status Field Descriptions	<u>21-37</u>
View STS-1 Link Status	<u>21-40</u>
STS-1 Mapper Link Status Field Descriptions	<u>21-40</u>
■ Display or Clear G.826 Statistics	<u>21-42</u>

Purpose	21-42
Related Information	21-42
Procedure	21-42
G.826 Statistics Field Descriptions	21-43
■ Reinitialize T1/E1 Framer	21-44
Purpose	21-44
Before You Begin	21-44
Procedure	21-44
■ Inserting Errors	21-45
Insert Errors	21-45
■ Diagnostic Loops	21-46
Loop Types	21-46
Select Loop for T1/E1 Link	21-47
Loop Selection Screen Field Descriptions	21-49
Select Loop for Mapper/LIU	21-50
■ ESF Statistics	21-51
Purpose	21-51
Before You Begin	21-51
View ESF Statistics	21-51
ESF Statistics Field Descriptions	21-52
■ 15-Minute Performance Registers	21-53
Before You Begin	21-53
View 15-min Performance Registers	21-53
15-min Performance Registers Field Descriptions	21-54
■ View In Service Links Only	21-55
■ Line Interface Unit (LIU) Monitor	21-56
View STS-1 Line Status	21-56
Line Interface Unit Monitor Display Field Descriptions	21-57
■ Monitor Control Signals	21-58
Purpose	21-58
Procedure	21-58
PCM Signalling Status Display Field Descriptions	21-59
■ Utilities Menu	21-61
Reset STS-1 Module	21-61
Change Board Status	21-62
■ N+1 Redundancy Menu	21-65

Display Redundancy Information	<u>21-65</u>
■ N+1 Redundancy Status Field Descriptions	<u>21-67</u>
■ About Menu	<u>21-68</u>
Display About Information	<u>21-68</u>
About Menu Field Descriptions	<u>21-68</u>

Physical Description



The STS-1 Module is used to provide SONET (Synchronous Optical Network) Path Terminating Equipment (PTE) functionality for the DACS II AX. 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.

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 currently not supported.

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	STATUS (Mapper) - 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	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.

Regulatory Information

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.

Before You Begin

Notes about the STS-1 Module

- A slot must be configured for STS-1.
 - The STS-1 application module and rear interface must be physically present in the DACS II AX chassis.
 - For cabling and interface requirements, refer to Appendix B.
-

Configure Slot for STS-1 Module

Configure Slot Configure a slot for the STS-1 module. Refer to [Configuring a Slot: page 4-8](#).

Configure STS-1 Module

Purpose

There are two parts to configuring an STS-1 module:

1. Configure the STS-1 module and the virtual tributaries
 2. Configure the T1/E1 links.
-

Procedure

To configure the STS-1 module:

1. From the *DACS II AX Main Menu* you can do one of the following:
 - Select *System Configuration*, then select *Slot Configuration*. Move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.



NOTE:

You must use press **P** to configure the module. If you go through the module's Main Menu, you will access view-only configuration screens.

The Configuration Menu displays.

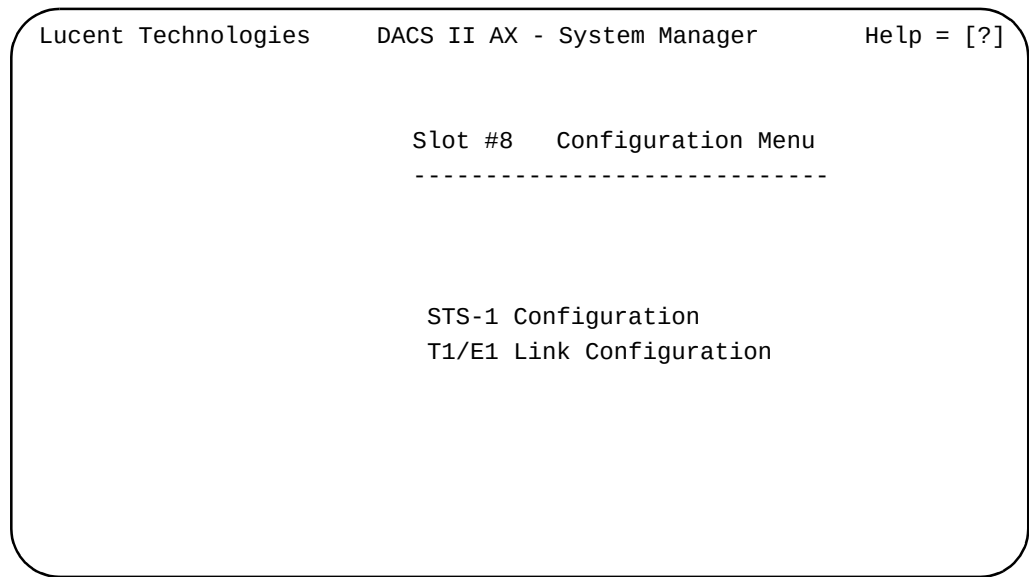


Figure 21-2. Configuration Menu

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.

Complete the STS-1 Configuration before the T1/E1 Link Configuration.

STS-1 Configuration

Mapping T1/E1 links into SONET Virtual Tributaries

Each T1 or E1 link is mapped into a Virtual Tributary (VT) group, which is part of the SONET payload structure. Up to four T1 links can be mapped into a SONET VT-1.5. Each bit of the T1 is associated with a location in the VT-1.5. Up to three E1 links can be mapped into a SONET VT-2. Each bit of the E1 is associated with a location in the VT-2. A VT group will always consist of either four T1 links or three E1 links per group. Refer to [Table 21-1](#).



NOTE:

E1 is currently not supported.

Table 21-1. STS-1 Mapping

Link	T1/E1	VT Type	Group	STS-1
1	T1	VT 1.5	1	
2	T1			
3	T1			
4	T1			
5	T1	VT 1.5	2	
6	T1			
7	T1			
8	T1			
9	T1	VT 1.5	3	
10	T1			
11	T1			
12	T1			
13	T1	VT 1.5	4	
14	T1			
15	T1			
16	T1			
17	T1	VT 1.5	5	
18	T1			
19	T1			
20	T1			
21	T1	VT 1.5	6	
22	T1			
23	T1			
24	T1			
25	T1	VT 1.5	7	
26	T1			
27	T1			
28	T1			

Before You Begin

The STS-1 Configuration must be set up prior to configuring the T1 links. E1 is not supported for this release.

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:

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

Slot #8 STS-1 Configuration

VT Group#	Type	
1:	VT-1.5 (DS1)	Clocking.....: EC-1 Line
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 21-3. 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 Virtual Tributary group number.

Type: (*option field*) Select either *VT-1.5* for T1 or *VT-2* for E1.
(*VT-2* currently not available).

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 not available).

T1/E1 Link Configuration

Configure T1 Links

To configure the T1 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 - System Manager			Help = [?]		
Slot #8		T1/E1 Links Configuration					

Nbr	Link Name	Clear T1/E1	Framing	FDL	Network Loop	Yel Alarm	Idle 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 21-4. 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 - System Manager 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 21-5. 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**.
5. Press **X** to return to the previous menu.

**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.

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 the STS-1 module 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).

Main Menu

The STS-1 Main Menu is accessed from the Node Summary Menu. From the Main Menu, you can display the module configuration, run diagnostic tests, access utilities, view N+1 Redundancy status (for DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware revision levels).

Access STS-1 Main Menu

To access the STS-1 Main Menu:

1. From the DACS II AX *Main Menu*, select *Node Summary*.
2. Place the cursor on the slot number where the STS-1 Module is located and press **<Enter>**. The STS-1 *Main Menu* displays.



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.

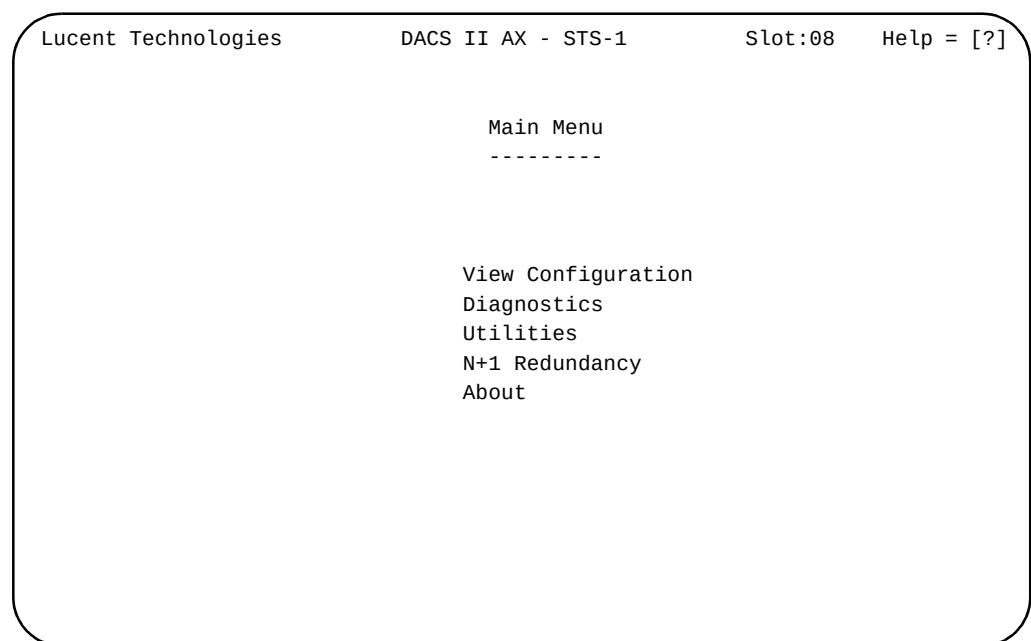


Figure 21-6. STS-1 Main Menu

View Configuration

- Purpose** The View Configuration option available from the module's main menu enables you to display the configuration for the STS-1 module and the T1/E1 links on the STS-1 module.
- Related Task** To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**. For details, refer to [Configure STS-1 Module: page 21-11](#).
- Procedure** To display STS-1 module configuration.
1. From the *Main Menu*, select *View Configuration*.
 2. Select an option.
 - Select *STS-1 Configuration* to display the mapping for the STS-1 Virtual Tributaries, STS-1 Timing, and cable settings. The STS-1 Configuration Menu displays. Refer to [STS-1 Configuration Field Descriptions: page 21-16](#) for an explanation of the fields in this menu.

Lucent Technologies DACS II AX - STS-1 Help = [?]

Slot #8 STS-1 Configuration

VT Group#	Type	

1:	VT-1.5 (DS1)	Clocking.....: EC-1 Line
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 21-7. View STS1 Configuration Submenu

- Select *T1/E1 Link Configuration* to display the T1/E1 link configuration. Press **N** to view more links. Move the cursor to a link and press **<Enter>** to display status information for that link. The fields are described in [Link Configuration Field Descriptions: page 21-19](#).

Lucent Technologies		DACS II AX - STS-1			Help = [?]		
Slot #8		T1/E1 Links Configuration					

Nbr	Link Name	Clear T1/E1	Framing	FDL	Network Loop	Yel Alarm	Idle 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

Figure 21-8. View T1/E1 Links Configuration Submenu

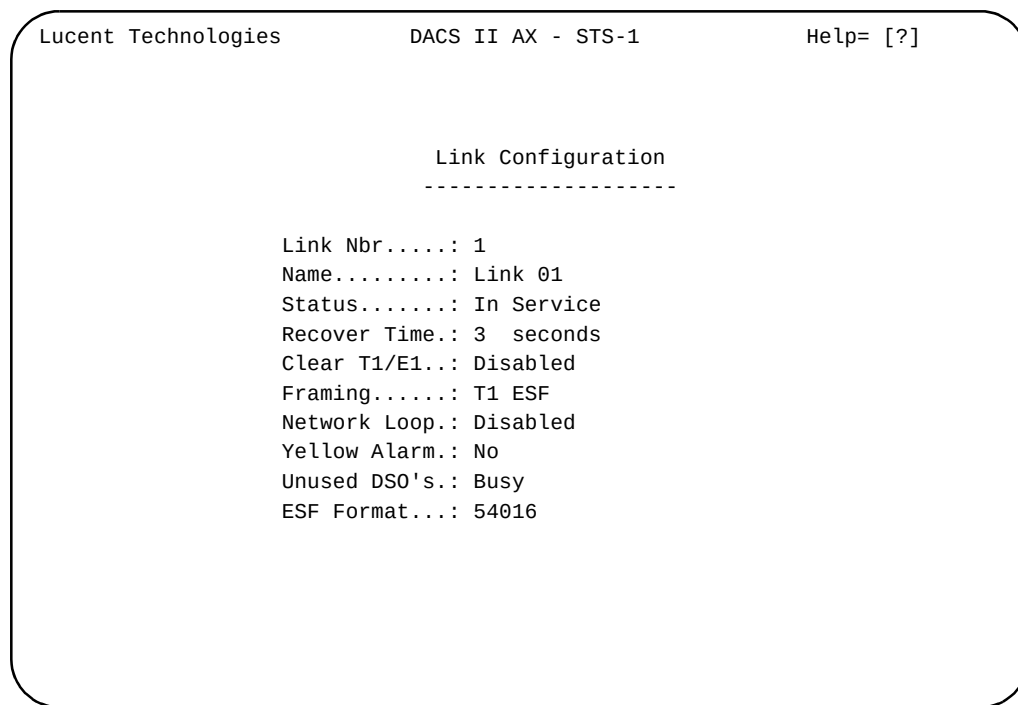


Figure 21-9. View Individual T1/E1 Link Configuration Submenu

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

Diagnostics

Overview The Diagnostics Menu provides access to diagnostics, 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.

Before You Begin A module must be In Service to access the Diagnostics Menu. For further information, see [Change Board Status: page 21-62](#).

Access Diagnostics Menu To view and perform diagnostics on the STS-1 module:

1. From the *Main Menu*, select *Diagnostics*.

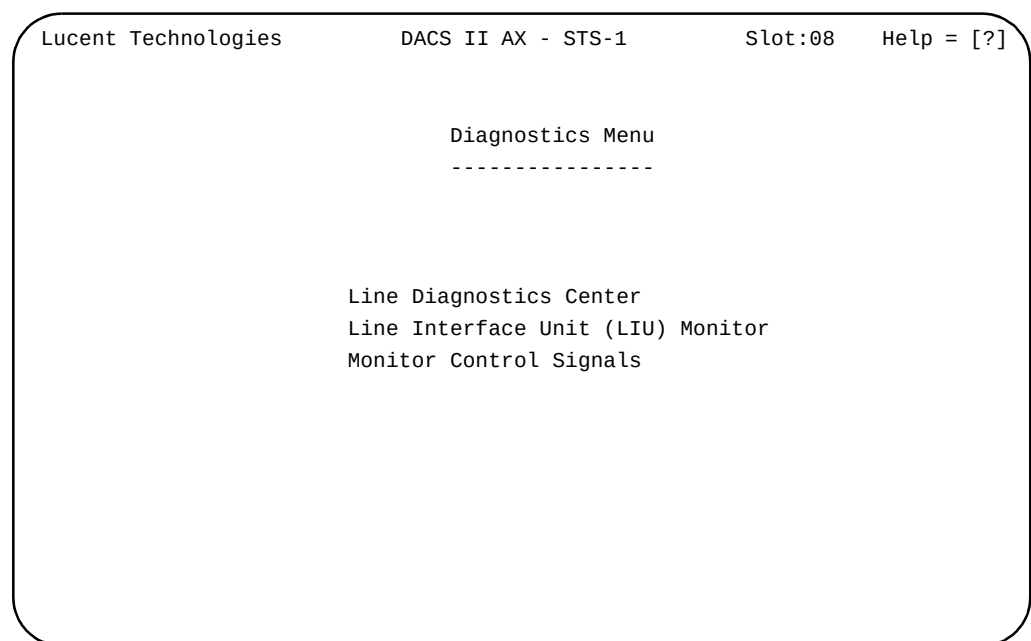


Figure 21-10. Diagnostics Menu

Diagnostics Menu Options

There are three options on the *STS-1 Diagnostics Menu*:

- **Line Diagnostics Center:** Use to access line diagnostics such as loopbacks and built-in BERTs.
 - **Line Interface Unit (LIU) Monitor:** Use to display the status of loopbacks and errors.
 - **Monitor Control Signals:** Use to observe PCM signalling status for a link.
-

Line Diagnostics

Perform Line Diagnostics

To perform Line Diagnostics, such as loopbacks and BERTs:

1. From the *Diagnostics Menu*, select *Line Diagnostics Center*. The Diagnostics Manager Menu displays.

Lucent Technologies

DACS II AX - STS-1

Slot:08

Help = [?]

Diagnostics Manager

Link Name	DS1/E1		VT		Link	Back	Bert Testing		
	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

[E]xpose

[C]lear counters

[L]oop

[S]tatistics (ESF)

[N]ext

15-min Performance

[R]egisters

[I]n service (toggle view)

Figure 21-11. Diagnostics Manager Submenu

The *Diagnostics Manager* displays the status for all of the T1/E1 links in the STS-1. The first seven links are displayed, to view an additional 7 links (up to 28 total), press **N**.

Clear Counters

To clear counters for the mapper and all 28 links (including those not shown on the current screen), press **C**. To clear counters for just the Mapper/LIU or a single link, put the cursor on the link, press **E** to expose the link, then press **C**.

**Diagnostics
Manager 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: page 21-37](#).

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: page 21-37](#)

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. Loop types are shown in [Figure 21-17](#).

Back Loop (Backplane Loop): *On* in this field indicates that a backplane loop is enabled.

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.

Diagnostics Manager Commands

The following commands are available from the Diagnostics Manager ([Figure 21-11](#)). To run a test or view statistics, place the cursor on a link or on the *Mapper/LIU* field and press one of the command keys:

- **[B] = Bert:** Provides several pseudo-random test patterns for testing both the T1/E1 links and the LIU. Link must be in-service and Clear T1/E1 must be disabled.
- **[E] = Expose:** Displays the status of the link and allows you to run additional procedures such as reinitializing the T1/E1 framers and injecting known errors.
- **[L] = Loop:** Provides several loopbacks for both the T1/E1 links and the Mapper/LIU.
- **[S] = Statistics (ESF):** Use to view *ESF Statistics*, which shows current and 24-hour statistics for the specific ESF link.
- **[R] = Registers:** Allows you to view *15-min Performance Registers*, which shows statistics by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

Additional commands on the Diagnostics Manager are:

- **[C] = Clear Error Counters:** Clears **all** errored second and BERT counters for all 28 links and the Mapper/LIU.
- **[N] = Next:** Allows you to view an additional 7 links (up to 28 total).
- **[I] = In Service:** Allows you to toggle between displaying all links or only those links that are currently in service.

BERT (Bit Error Rate Test)

Overview 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.

Start 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/E1 ----- DS1/E1 -----
[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]ystem 2047 (BERT -> Link and BERT -> Backplane)
  
```

Figure 21-12. Bert Selection Submenu

The *BERT Selection* submenu has a list of several test patterns that you can choose.

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 command key indicated on the bottom of the menu. The selectable patterns and their corresponding command keys are as follows:

DS1/T1 BERT:

- **[2]** Unframed 2047
- **[3]** Unframed 2¹⁵ (Inverted Pattern according to ITU 0.151)
- **[4]** Unframed 2²⁰
- **[5]** Unframed 2²³ (Inverted Pattern according to ITU 0.151)
- **[6]** Unframed 2¹¹ - 7 0's limits
- **[7]** Unframed 2¹⁵ - 7 0's limits
- **[8]** Unframed QRSS
- **[9]** Unframed 2²³ - 14 0's limits
- **[B]** Framed 2047
- **[C]** Framed 2¹⁵ (Inverted Pattern according to ITU 0.151)
- **[D]** Framed 2²⁰
- **[E]** Framed 2²³ (Inverted Pattern according to ITU 0.151)
- **[F]** Framed 2¹¹ - 7 0's limits
- **[G]** Framed 2¹⁵ - 7 0's limits
- **[H]** Framed QRSS
- **[I]** Framed 2²³ - 14 0's limits

Other Selections:

- **[O]** Off
- **[A]** All 2047 (All T1/E1 links generate 2047 Bert Pattern)
- **[S]** System 2047 (BERT -> Link and BERT -> Backplane)

3. Press **X** to start the test.
 4. At the prompt, *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 *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, place the cursor on the link with the BERT test, press **B** and the *BERT Selection* submenu appears.
 2. With the cursor on the *New BERT* field, type **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.
-

Start LIU BERT

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:

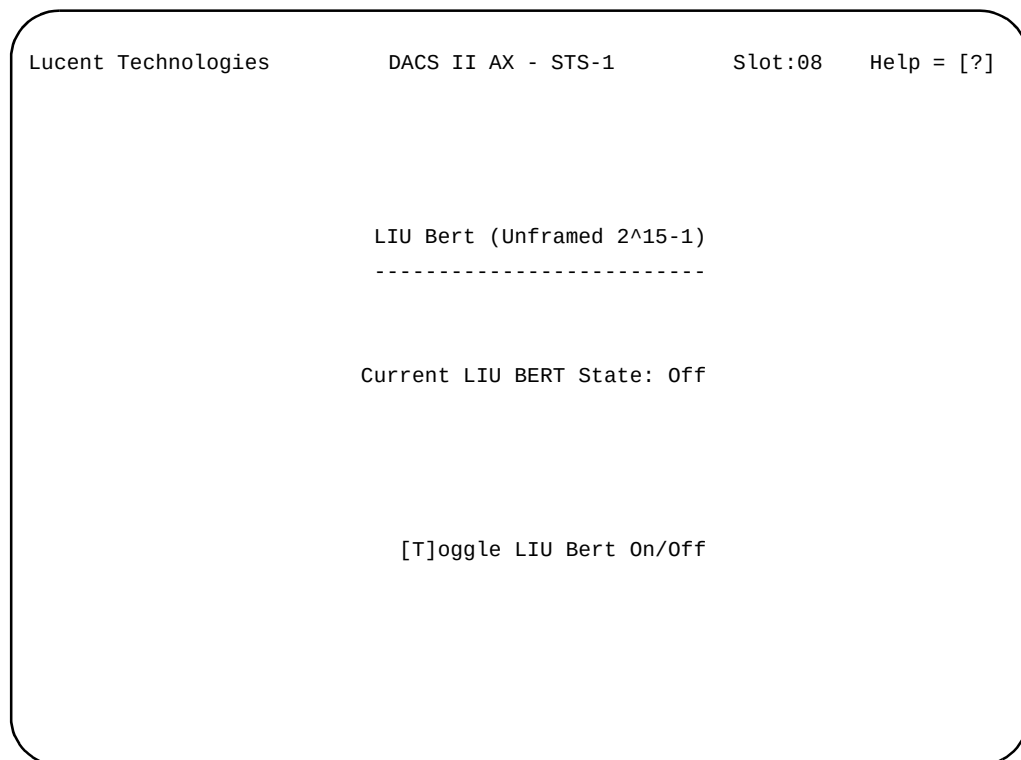


Figure 21-13. LIU Bert Submenu

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.

Stop LIU BERT

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.

Status

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    Re[i]nitalize
ESF [S]tatistics    15-min Performance [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 21-14. 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 15-min Performance 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 network interface 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

Link Name: Contains the name of the specific link for which the status is being displayed.

DS1/E1 Status Fields

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.

Rx Slip (Receive Slip): This field will display *On* to indicate that slip has been detected in the receive path.

VT (Virtual Tributary) Status

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 STS-1 Link Status

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 21-15. STS-1 Mapper Link Status Submenu

From the *STS-1 Mapper Link Status* submenu, press **C** to clear the counters for the mapper link.

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.

Display or Clear G.826 Statistics

Purpose 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.

Related Information The G.826 Statistics Display is not accessible for E1 links without CRC or T1 links with D4 framing.

Procedure To access the G.826 Statistics screen:

1. From the *T1/E1 Link Status* submenu, press **G**. The following display appears:

```
Eastern Research, Inc.          DNX - HDS3          Slot:08  Help =  
[?]  
  
          G.826 Statistics  
          -----  
  
Link#: 1  
Total Time.....: 370  
Errored Seconds.....: 0  
Error Free Seconds.....: 370  
Severely Errored Seconds.....: 0  
Consecutive Severely Errored Seconds: 0  
Consecutive Error Free Seconds.....: 370  
Background Block Error.....: 0  
Errored Seconds Ratio.....: 0.00 %  
Severely Errored Seconds Ratio.....: 0.00 %  
Background Block Error Ratio.....: 0.00 %  
  
[C]lear Counters
```

Figure 21-16. 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.

**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 Block Error: An errored block not occurring as part of a severely errored second. This field displays the number of background block errors 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 Block Error 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 T1/E1 Framer

Purpose 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.

Before You Begin



CAUTION:

Reinitializing the framer will cause data to be momentarily interrupted for the selected link.

Procedure

To reinitialize the framer:

1. From the *T1/E1 Link Status* submenu, press **I**. The following message appears: *Are you sure to reinitialize the framer? Are you sure (Y/N)?*
 2. Press **Y**. The T1/E1 framer will be reinitialized, and you are returned to the *T1/E1 Link Status* submenu. If you press **N**, 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 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 command 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

Loop Types

The loop types for the STS-1 module are shown in [Figure 21-17](#).

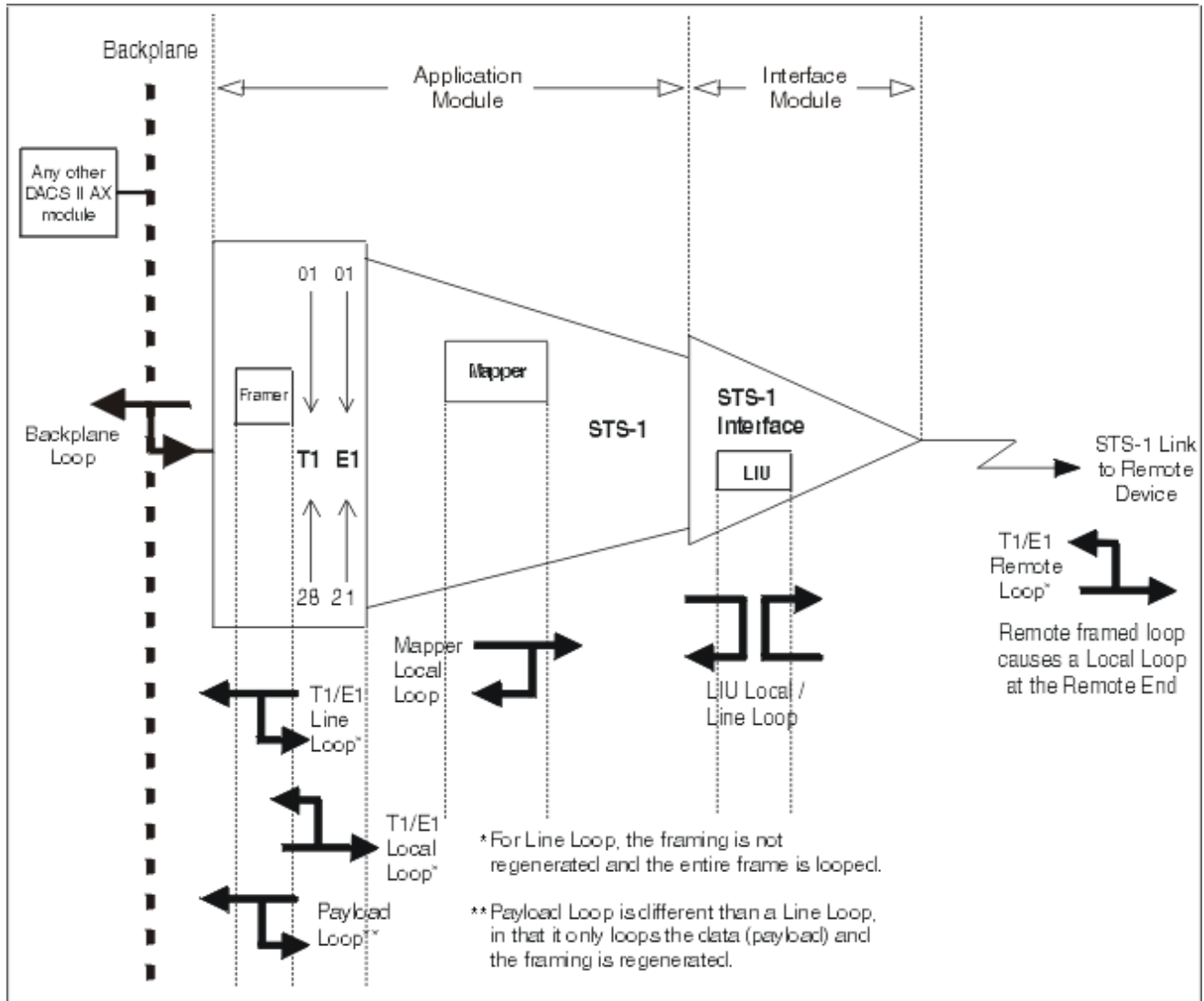


Figure 21-17. STS-1 Module Loops

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 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 : [O]ff  [L]ocal  Li[n]e  [R]emote  [P]ayload  
  
                    [1]All Local  
                    [2]All Line  
  
Backplane Loop:   [T]oggle
```

Figure 21-18. 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:

If the link is in Clear T1/E1 Unframed mode, payload and remote loops will not function.

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] *  
                                *          Are you sure (Y/N)?          *  
                                [1] *  
                                [2] *****  
  
Backplane Loop:  [T]oggle
```

Figure 21-19. 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 21-20. 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 command 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

Purpose 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.

Before You Begin ESF Statistics can only be displayed for links that are configured as ESF.

View ESF Statistics To view ESF statistics:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable link, and press **S**. If the link has been configured for ESF, the *ESF Statistics* are displayed for the selected link appears. If the link is not configured for ESF, an error message appears.



NOTE:
 ESF Statistics can also be displayed from the T1/E1 Link Status submenu by pressing **S**.

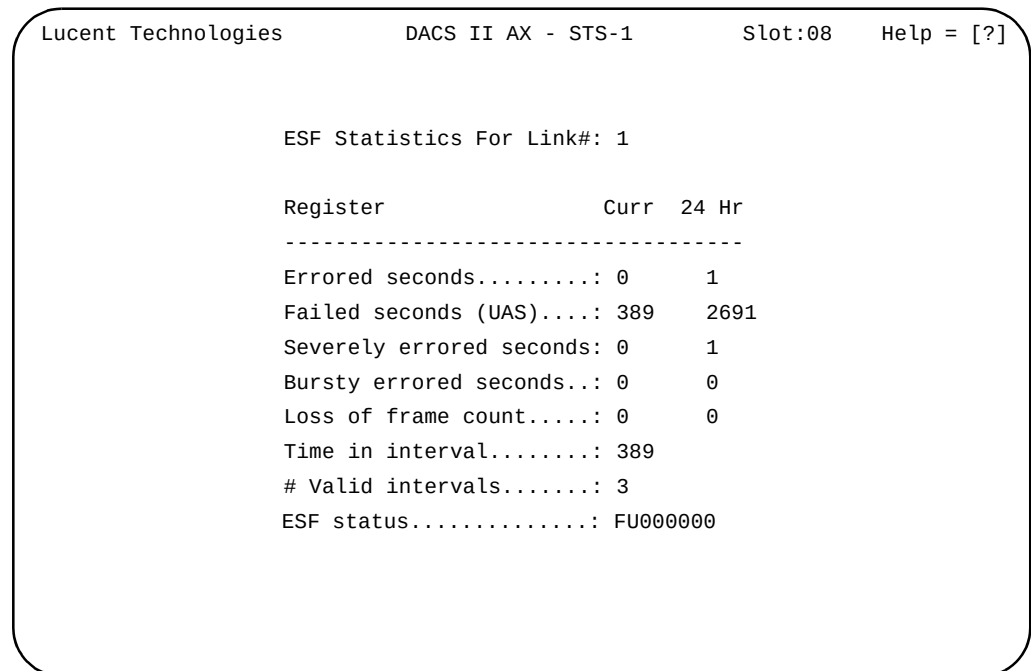


Figure 21-21. ESF Statistics Display

**ESF Statistics 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.

15-Minute Performance Registers

The *15-min Performance Registers* screen displays statistics broken down by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period.

- Before You Begin** 15-minute Performance Registers are not applicable for D4-framed links.
- View 15-min Performance Registers** To view 15-min Performance Registers:
1. From the *Diagnostics Manager* submenu, place your cursor on the applicable link and press **R**. The *15-min Performance Registers* display for the selected link appears. Press **N** to view the next 48 intervals.

 **NOTE:**
 15-min Performance 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 = [?]

15-min Performance 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

[N]ext Page

Figure 21-22. 15-min Performance Registers Display

**15-min
Performance
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:

1. 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.

Lucent Technologies

DACS II AX - STS-1

Slot:08

Help = [?]

Diagnostics Manager

Link Name	DS1/E1		VT		Link Loop	Back Loop	State	Bert Testing	
	State	ErrSecs	State	ErrSecs				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
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----									
Mapper/LIU	OK	0	NA	NA	Local	NA	Off	0	0
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----									

[B]ert

[E]xpose

[C]lear counters

[L]oop

[S]tatistics (ESF)

[N]ext

15-min Performance

[R]egisters

[I]n service (toggle view)

Figure 21-23. Diagnostics Manager with In-Service Links Displayed

2. 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 21-24. 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.

**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.

Local Loop: *On* indicates that an LIU local loop has been enabled.

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 (± 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

Purpose The Monitor Control Signals option is used to observe the status of Pulse Coded Modulation (PCM) signalling for the STS-1 Module's configured links.

Procedure 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:

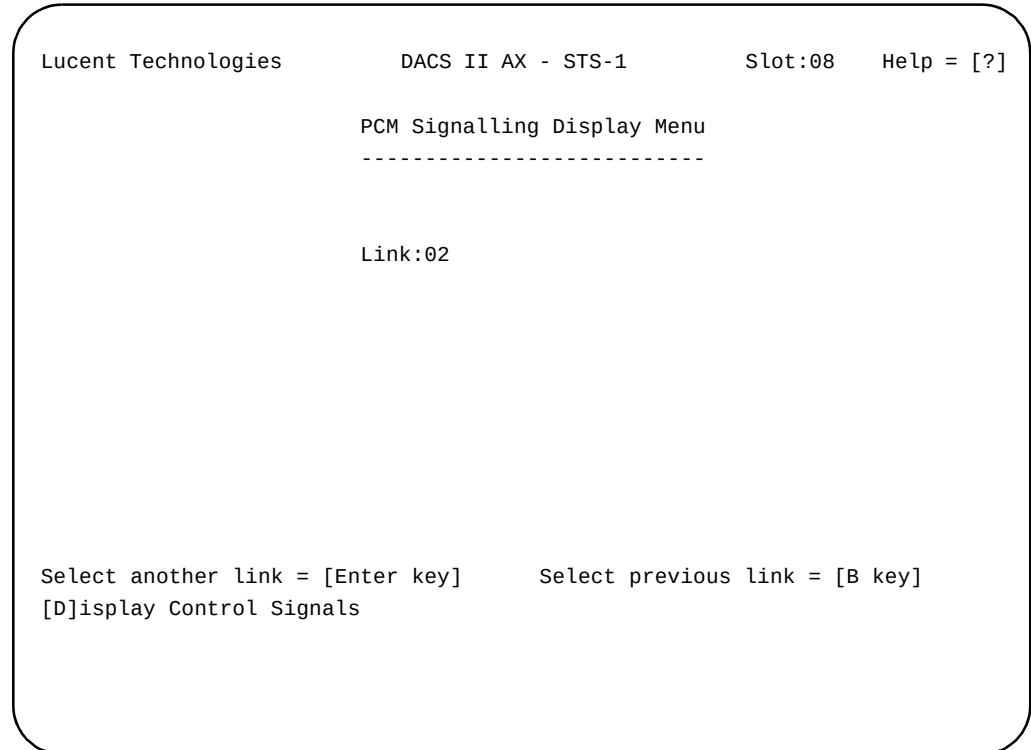


Figure 21-25. PCM Signalling Display Menu.

2. From the PCM Signalling Display Menu, press **<Enter>** to toggle to the link number you want to view.
3. Press **D**, and the following menu appears displaying the selected link:

Lucent Technologies			DACS II AX - STS-1		Slot:08	Help = [?]
Link:2			PCM Signalling Display Menu			
DS0	To Link	To Bus	DS0	To Link	To Bus	

01	A_C_	A_C_	13	ABC_	ABC_	
02	A_CD	A_CD	14	A__	A__	
03	AB__	AB__	15	A_D	A_D	
04	AB_D	AB_D	16	A_C_	A_C_	
05	ABC_	ABC_	17	A_CD	A_CD	
06	ABCD	ABCD	18	AB__	AB__	
07	__D	__D	19	AB_D	AB_D	
08	_C_	_C_	20	Data	Data	
09	_CD_	_CD_	21	Data	Data	
10	_B_	_B_	22	Data	Data	
11	_B_D	_B_D	23	Data	Data	
12	_BC_	_BC_	24	Data	Data	

Figure 21-26. PCM Signalling Status Display

The *PCM Signalling Status Display* is a read-only screen which displays the control signals for a selected link. Descriptions of each field on this screen are supplied on the following page.

PCM Signalling Status Display Field Descriptions

Link: Displays the link number for which the control signals are shown.

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.

- *N/A* indicates that the DS0 has not been mapped.
- *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 PCM signalling bit status (per ATT Technical Reference 43801) in the direction of the DACS II AX Bus.

- *N/A* indicates that the DS0 has not been mapped. *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 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 interrupted.

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 21-27. 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:

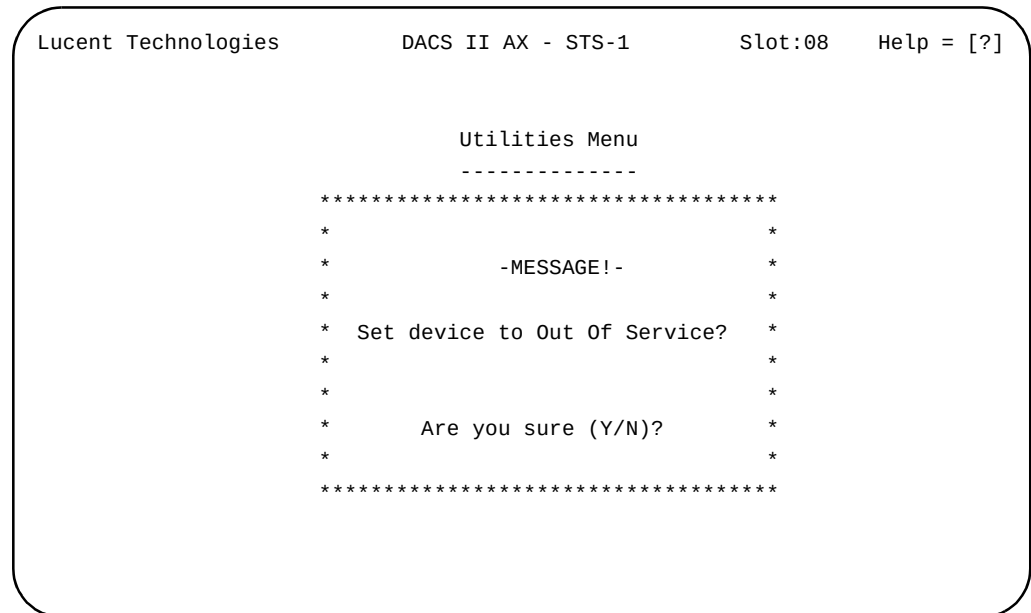


Figure 21-28. Board Status Screen

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.

```

Lucent Technologies          DACS II AX - STS-1          Slot:08      Help = [?]

                                Utilities Menu
                                -----

                                *****
                                *
                                *              -MESSAGE! -              *
                                *
                                *              *
                                * Set device to In Service? **Device Will Reset** *
                                *
                                *              *
                                *              Are you sure (Y/N)?          *
                                *
                                *****
  
```

Figure 21-29. 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. Below the separator, the text 'Device Redundancy' is visible, followed by a blank line.

```
Lucent Technologies      DACS II AX - STS-1      Slot:08      Help = [?]  
  
N+1 Redundancy Menu  
-----  
  
Device Redundancy  
  

```

Figure 21-30. 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

[C]lear counters

Figure 21-31. N+1 Redundancy Status Menu

The *N+1 Redundancy Status* menu is a read-only screen. Press **C** to clear the counters. 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:

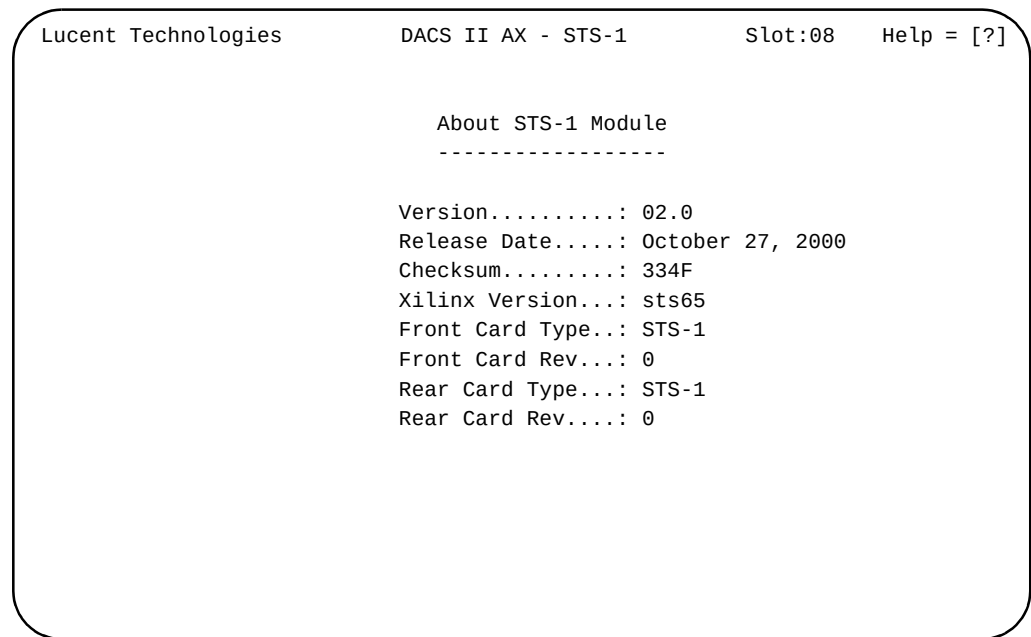


Figure 21-32. About STS-1 Module Display

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.

Contents

■ Physical Description	<u>22-5</u>
■ LED Descriptions	<u>22-7</u>
STATUS - Framer/LIU	<u>22-7</u>
TEST - Framer/LIU	<u>22-7</u>
STATUS - Payload	<u>22-7</u>
TEST - Payload	<u>22-7</u>
READY	<u>22-7</u>
ALL LEDs	<u>22-8</u>
■ Regulatory Information	<u>22-9</u>
North America	<u>22-9</u>
Product Safety	<u>22-9</u>
Europe	<u>22-9</u>
■ Before You Begin	<u>22-10</u>
Notes about the Hybrid DS-3 Module	<u>22-10</u>
■ Configure Slot for Hybrid DS-3 Module	<u>22-11</u>
Configure Slot	<u>22-11</u>
■ Configure Hybrid DS-3 Module	<u>22-12</u>
Purpose	<u>22-12</u>
Procedure	<u>22-12</u>

■ Hybrid DS-3 Configuration	<u>22-14</u>
Mapping T1/E1 links into DS-2/G.747 Groups	<u>22-14</u>
■ HDS3 Port Configuration	<u>22-15</u>
Purpose	<u>22-15</u>
Configure HDS3 Port	<u>22-15</u>
HDS3 Port Configuration Field Descriptions	<u>22-16</u>
■ DS2/G.747 Group Type Configuration	<u>22-19</u>
Description	<u>22-19</u>
Configure DS2/G.747 Groups	<u>22-19</u>
DS2/G.747 Group Type Configuration Field Descriptions	<u>22-19</u>
■ T1/E1 Link Configuration	<u>22-20</u>
Configure T1/E1 Links	<u>22-20</u>
Link Configuration Field Descriptions	<u>22-21</u>
■ Main Menu	<u>22-23</u>
Access Hybrid DS-3 Main Menu	<u>22-23</u>
■ View Configuration	<u>22-24</u>
Purpose	<u>22-24</u>
Related Task	<u>22-24</u>
Procedure	<u>22-24</u>
■ Diagnostics Menu	<u>22-29</u>
Overview	<u>22-29</u>
Before You Begin	<u>22-29</u>
Access Diagnostics Menu	<u>22-30</u>
■ Line Diagnostics	<u>22-31</u>
Perform Line Diagnostics	<u>22-31</u>
Clear Counters	<u>22-32</u>
Line Diagnostics Manager Submenu Field Descriptions	<u>22-32</u>
Diagnostics Manager Commands	<u>22-34</u>
■ BERT (Bit Error Rate Test)	<u>22-35</u>
Before You Begin	<u>22-35</u>
Start BERT on a Link	<u>22-35</u>
Stop BERT on a Link	<u>22-38</u>
Start LIU BERT Test	<u>22-38</u>
Stop LIU BERT Test	<u>22-39</u>
■ Status	<u>22-40</u>
View Status of T1/E1 Links	<u>22-40</u>

T1/E1 Link Status Field Descriptions	22-41
View HDS-3 Framers Status	22-43
HDS-3 Framers Status Display Field Descriptions	22-44
■ Display or Clear G.826 Statistics	22-46
Purpose	22-46
Before You Begin	22-46
Procedure	22-46
■ G.826 Statistics Field Descriptions	22-47
■ Re-initialize T1/E1 Framers	22-49
Purpose	22-49
Before You Begin	22-49
Procedure	22-49
■ Inserting Errors	22-50
T1/E1 Link	22-50
HDS-3 Framers	22-50
■ Diagnostic Loops	22-52
Loop Types	22-52
Select Link Diagnostic Loop	22-53
Loop Selection Screen Field Descriptions	22-54
Select HDS3 Framers/LIU Diagnostic Loop	22-56
■ ESF Statistics	22-57
Purpose	22-57
Before You Begin	22-57
View ESF Statistics for a T1/E1 Link	22-57
ESF Statistics Display Field Descriptions	22-58
■ 15-Minute Performance Registers	22-59
Purpose	22-59
Before You Begin	22-59
View ESF Statistics	22-59
15-Minute Performance Registers Field Descriptions	22-60
■ View In Service Links Only	22-61
■ Line Interface Unit (LIU) Monitor	22-62
Line Interface Unit Monitor Display Field Descriptions	22-63
■ Monitor Control Signals	22-64
PCM Signalling Display Menu Field Descriptions	22-65
■ Utilities Menu	22-67

Reset Hybrid DS-3 Module	<u>22-68</u>
Change Board Status	<u>22-68</u>
■ N+1 Redundancy Menu	<u>22-71</u>
N+1 Redundancy Status Field Descriptions	<u>22-72</u>
■ About Menu	<u>22-74</u>
■ About Menu Field Descriptions	<u>22-75</u>

Physical Description

The Hybrid DS-3 module set assembly consists of two circuit cards:

- a Hybrid DS-3 Application Module that contains backplane, switching, and framing logic. It contains a microprocessor, and FLASH memory for program storage.
- an Interface Module which provides electrical interface connections.

The Hybrid DS-3 module assembly occupies a single backplane slot in the DACS II AX chassis.

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.

Features

The Hybrid DS-3 module set has these capabilities:

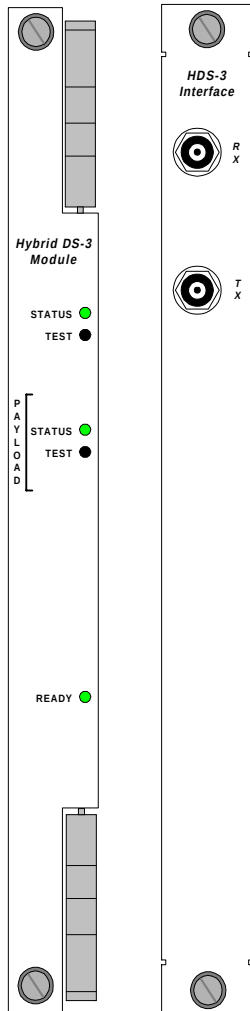
- Supports both T1 and E1 links.
- Allows the DACS II AX to connect to a DS-3 compatible link, and is capable of multiplexing up to 28 T1 links or 21 E1 links into a single DS-3 signal.
- Can be protected. The Hybrid DS-3 module can be part of a Hybrid DS-3 protection group when it is utilized in a DACS II AX-11 chassis with the N+1 Protection Switch.
- 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.

Capacity

A maximum of six Hybrid DS-3 module sets may be installed in the DACS II AX-11, with all DS0s mapped. More than six module sets may be installed, although not all associated DS0s can be mapped due to insufficient backplane bandwidth.

For T1, six Hybrid DS-3 module sets can be supported based on mapping up to 28 links per card for a total of 168 DS1s with all 24 DS0s mapped on each DS1.



For E1, six Hybrid DS-3 module sets can be supported based on mapping up to 21 links per card for a total of 126 E1s with all 32 DS0s mapped on each E1.

Mix of T1 and E1 Links

A Hybrid DS-3 module set can support a mix of T1 and E1 links. Examples are shown in the following table.

Type	Number of Links Supported							
DS1	0	4	8	12	16	20	24	28
E1	21	18	15	12	9	6	3	0

LED Descriptions

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.

STATUS - Framer/LIU

STATUS (Framer/LIU) - Green indicates the Framer/LIU port is operational and functional. Red indicates that the Framer/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 - Framer/LIU

TEST (Framer/LIU) - Solid yellow indicates the Framer/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 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

Notes about the Hybrid DS-3 Module

- A slot must be configured for Hybrid DS-3.
 - The Hybrid DS-3 application module and rear interface must be physically present in the DACS II AX chassis.
 - For cabling and interface requirements, refer to Appendix B.
-

Configure Slot for Hybrid DS-3 Module

Configure Slot Configure a slot for the Hybrid DS-3 module. Refer to [Configuring a Slot: page 4-8](#).

Configure Hybrid DS-3 Module

Purpose

There are three parts to configuring a Hybrid DS-3 module that should be configured in sequence:

1. Configure the hybrid DS-3 port.
 2. Configure the DS2/G.747 groups as DS1 or E1.
 3. Configure the T1/E1 links.
-

Procedure

To configure the Hybrid DS-3 module:

1. From the *DACS II AX Main Menu* you can do one of the following:
 - Select *System Configuration*, then select *Slot Configuration*. Move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.
 - Select *Node Summary*, type **S** for **[S]lot Cfg**, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg**.



NOTE:

You must use press **P** to configure the module. If you go through the module's Main Menu, you will access view-only configuration screens.

The *HDS-3 Configuration Menu* displays.

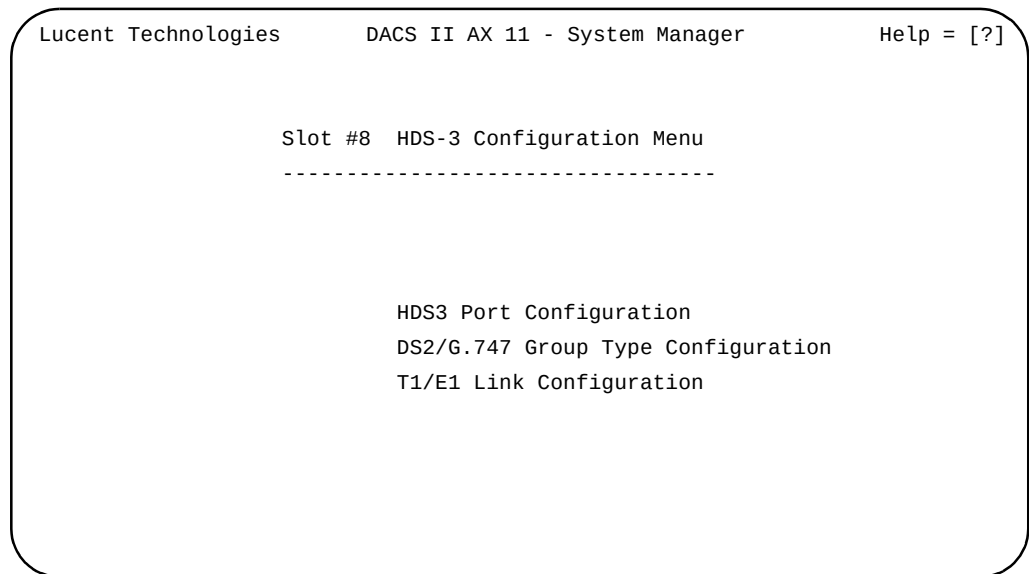


Figure 22-1. HDS-3 Configuration Menu

The *HDS-3 Configuration Menu* has three options:

- Select *HDS3 Port Configuration* to configure the Hybrid DS-3 port.
- Select *DS2/G.747 Group Type Configuration* to configure the T1 and E1 groups.
- Select *T1/E1 Link Configuration* to configure the T1 and E1 links.

Hybrid DS-3 Configuration

Mapping T1/E1 links into DS-2/ G.747 Groups

A group consists of four T1 links or three E1 links per group with the fourth link not available.

Link	T1/E1	DS2/G.747 Group	Hybrid DS-3
1	T1	1	
2	T1		
3	T1		
4	T1		
5	E1	2	
6	E1		
7	E1		
8	Not Used		
9	T1	3	
10	T1		
11	T1		
12	T1		
13	E1	4	
14	E1		
15	E1		
16	Not Used		
17	T1	5	
18	T1		
19	T1		
20	T1		
21	T1	6	
22	T1		
23	T1		
24	T1		
25	T1	7	
26	T1		
27	T1		
28	T1		

HDS3 Port Configuration

Purpose Use the *HDS3 Port Configuration Menu* to set options for the hybrid DS-3 port.

Configure HDS3 Port To configure the hybrid DS-3 port:

1. From the *Configuration Menu* ([Figure 22-1](#)), select *HDS3 Port Configuration*. The HDS3 Port Configuration menu displays ([Figure 22-2](#)).

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

Slot #8 HDS3 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'.....: Yes
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 22-2. HDS3 Port Configuration Submenu

Refer to the field descriptions on the following page.

2. Press **X** to save changes. When prompted: "Update Configuration? Are you sure (Y/N)?" Press **Y**.

**HDS3 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

Description

The hybrid DS-3 supports seven groups of DS1 links or E1 links. For E1, the group has three E1 links with the fourth link not available. For DS1, the group has four DS1 links.

Configure DS2/G.747 Groups

To configure the DS2/G.747 groups:

1. From the *Configuration Menu* ([Figure 22-1](#)), select *DS2/G.747 Group Type Configuration*. The DS2/G.747 Group Type Configuration menu displays ([Figure 22-3](#)).

Group#	Type
1:	DS1
2:	DS1
3:	E1
4:	DS1
5:	DS1
6:	DS1
7:	DS1

Figure 22-3. DS2/G.747 Group Type Configuration Submenu

2. Press **<Enter>** to select either *DS1* or *E1* for each group to be defined.
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 *HDS-3 Configuration Menu* ([Figure 22-1](#)), select *T1/E1 Link Configuration*. The T1/E1 Link Configuration Menu displays ([Figure 22-4](#)).

```

Lucent Technologies          DACS II AX 11 - System Manager          Help = [?]
      Slot #8      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 22-4. T1/E1 Link Configuration Submenu



NOTE:

Link Not Available appears on the fourth link of an E1 group, and no configuration is possible for that link. [Figure 22-4](#) shows a Link Not Available for Link 08.

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 22-5](#)).


```
Lucent Technologies      DACS II AX 11 - System Manager      Help = [?]
                          Slot #8      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 DS0's.: Idle
                          ESF Format....: 54016
```

Figure 22-5. Link Configuration Submenu

3. Modify the entries.
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 a T1/E1 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.

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. When Clear T1/E1 is set to Unframed, the available framing types are *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 or E1 circuit to discard data and send a yellow alarm if it is in a red alarm condition for the value entered for **Recover Time**. *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.

Main Menu

The Hybrid DS-31 Main Menu is accessed from the Node Summary Menu. From the Main Menu, you can display the module configuration, run diagnostic tests, access utilities, view N+1 Redundancy status (for DACS II AX-11 units with N+1 Protection Switch), and display module identification (software and hardware revision levels).

Access Hybrid DS-3 Main Menu

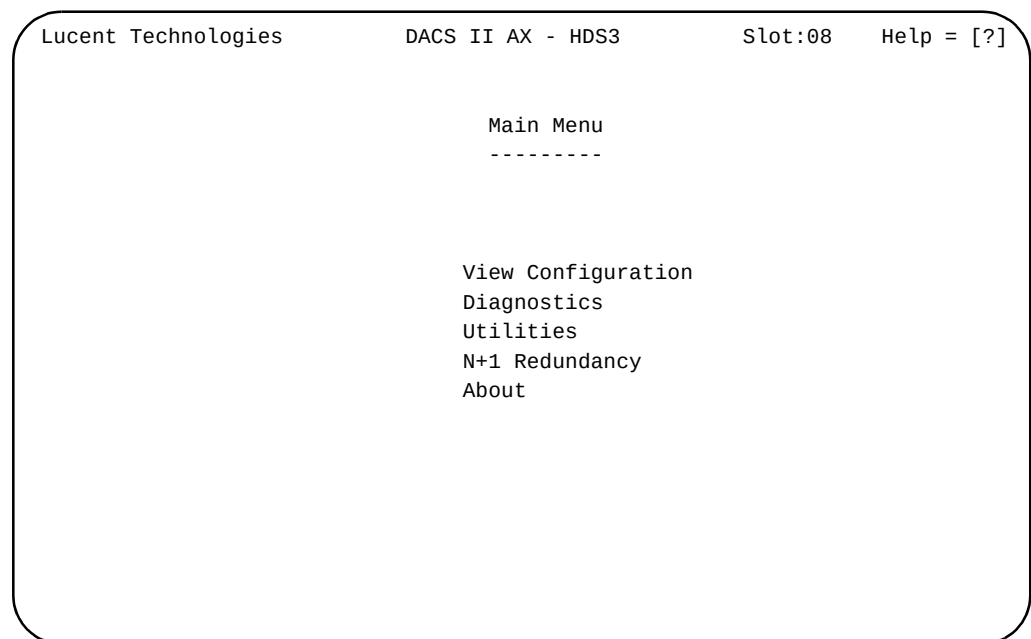
To access the Hybrid DS-3 Main Menu:

1. From the DACS II AX *Main Menu*, select *Node Summary*.
2. Place the cursor on the slot number where the Hybrid DS-3 is located and press **<Enter>**. The Hybrid DS-3 *Main Menu* displays.



NOTE:

On the Node Summary Menu, the Configured Type must display "Hybrid DS-3" and the Device State must display "Online" 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.



View Configuration

Purpose The View Configuration option provides access to submenus from which the hybrid DS-3 Port, DS2/G.747 Groups, and T1/E1 links can be displayed.

Related Task To configure the links, go to the Node Summary menu, move the cursor to the slot where ports/links are to be configured and press **P** for **[P]ort/Link Cfg.** For details, refer to [Configure Hybrid DS-3 Module: page 22-12](#).

Procedure To display the Hybrid DS-3 module configuration:

1. From the Hybrid DS-3 *Main Menu*, select *View Configuration*. The Configuration Menu displays ([Figure 22-6](#)).

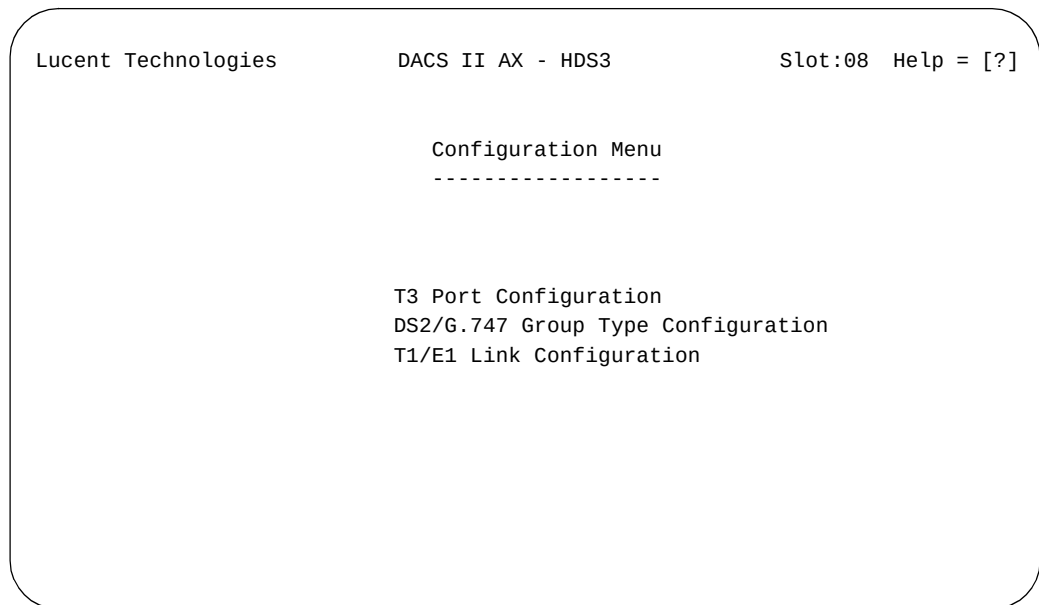


Figure 22-6. Configuration Menu

2. Select an option.

- Select *T3 Port Configuration* to display the hybrid DS-3 port settings. Fields are described in [HDS3 Port Configuration Field Descriptions: page 22-16](#).

Lucent Technologies DACS II AX - HDS3 Slot:08 Help = [?]

HDS3 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'.....: Yes
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 22-7. HDS3 Port Configuration

- Select *DS2/G.747 Group Type Configuration* to display the DS2/G.747 groups. Fields are described in [DS2/G.747 Group Type Configuration Field Descriptions: page 22-19](#).

Lucent Technologies

DACS II AX - HDS3

Slot:08

Help = [?]

HDS3 Framer DS2/G.747 Group Type Configuration

Group#	Type

1:	DS1
2:	E1
3:	DS1
4:	DS1
5:	DS1
6:	DS1
7:	DS1

Figure 22-8. HDS3 Framer DS2/G.747 Group Type Configuration

- Select *T1/E1 Link Configuration* to display the T1 and E1 links. Press **N** to view more links. Move the cursor to a link and press **<Enter>** to display status information for that link. The fields are described in [Link Configuration Field Descriptions: page 22-21](#).

```

Lucent Technologies          DACS II AX - HDS3          Slot:08  Help = [?]
                             T1/E1 Link Configuration
                             -----
Nbr      Link Name          Clear      Framing    FDL      Network  Yel  Idle
                             T1/E1                                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

```

Figure 22-9. T1/E1 Link Configuration

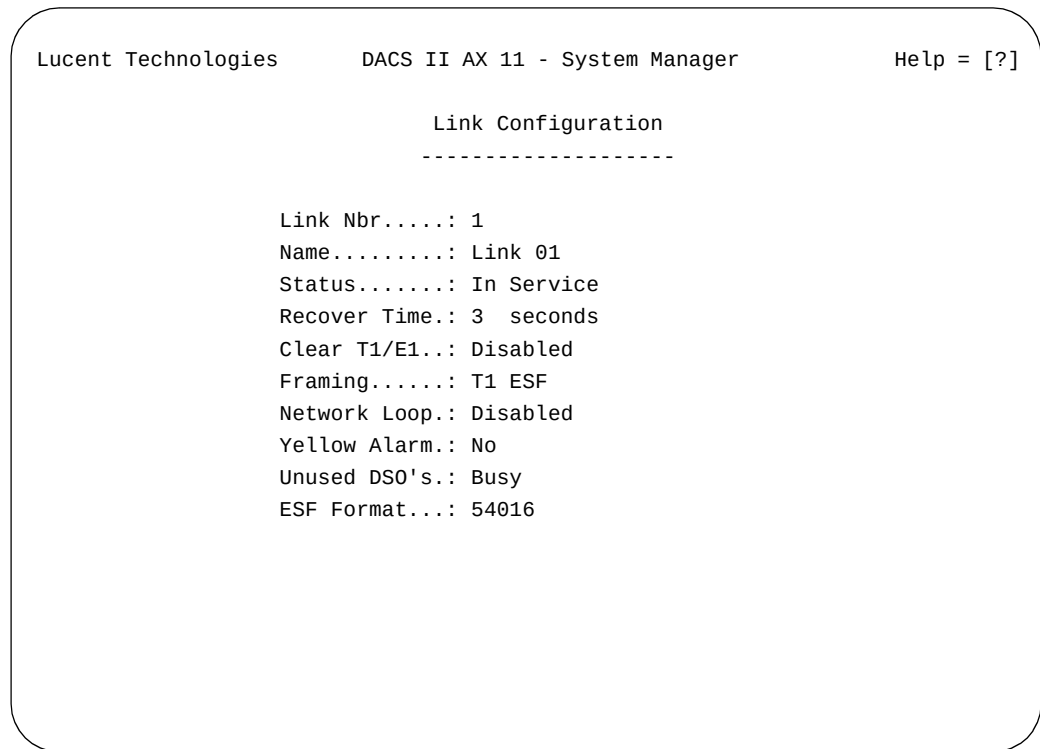


Figure 22-10. Link Configuration

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

Diagnostics Menu

Overview

The Diagnostics Menu provides access to several 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 22-18](#).

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.

Before You Begin

A module must be In Service to access the Diagnostics Menu. For further information, see [Change Board Status: page 22-68](#).

Access Diagnostics Menu

To view statistics and perform diagnostics on the Hybrid DS-3 module:

1. From the *Main Menu*, select *Diagnostics*. The Diagnostics Menu displays ([Figure 22-11](#)).

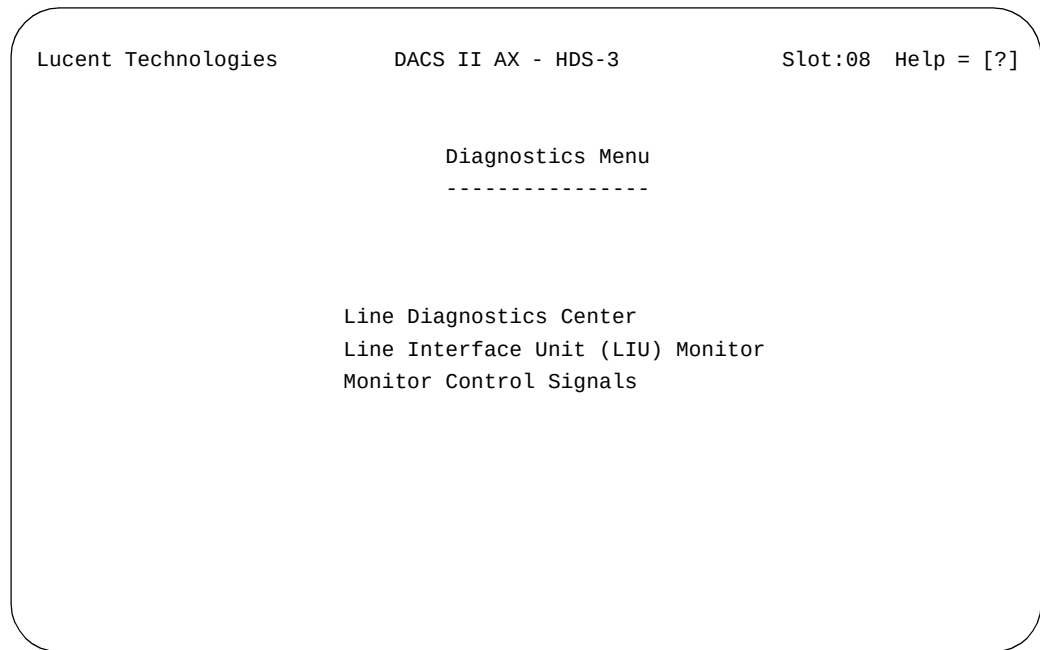


Figure 22-11. Diagnostics Menu

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.
-

Line Diagnostics

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 22-12](#)).

Lucent Technologies

DACS II AX - HDS3

Slot:08

Help = [?]

Diagnostics Manager

Link Name	DS1/E1		Link Loop	Back Loop	State	Bert Testing	
	State	ErrSecs				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)

15-min Performance

[R]egisters

[C]lear counters

[N]ext

[I]n service (toggle view)

Figure 22-12. Diagnostics Manager Submenu

The *Diagnostics Manager* displays the status for all of the T1/E1 links in the Hybrid DS-3. The first seven links are displayed, to view an additional 7 links (up to 28 total), press **N**.

Clear Counters To clear counters for the DS3 framer and all 28 links (including those not shown on the current screen), press **C**. To clear counters for just the DS3 framer or a single link, put the cursor on the link, press **E** to expose the link, then press **C**.

Line Diagnostics Manager Submenu These fields appear on the Diagnostics Manager menu ([Figure 22-12](#)).

Field Descriptions **Link Fields**

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: page 22-41](#).

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 22-18](#).

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 22-18](#).

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 Framers: 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.
-

Diagnostics Manager Commands

The following commands are available from the Diagnostics Manager ([Figure 22-12](#)). To run a test or view statistics, place the cursor on a link or on the *T3 Framer* field and press one of the command keys:

- **[B] = Bert:** Provides several pseudo-random test patterns for testing both the T1/E1 links and the DS3. Selectable only in Clear T1/E1 Disabled mode.
- **[E] = Expose:** Displays the status of the link and allows you to run additional procedures such as reinitializing the T1/E1 framers and injecting known errors. Selectable in all modes.
- **[L] = Loop:** Provides several loopbacks for both the T1/E1 links and the DS-3 link.
- **[S] = Statistics (ESF):** Use to view *ESF Statistics*, 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:** Allows you to view *15-min Performance Registers*, which shows statistics by link 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.

Additional commands on the Diagnostics Manager are:

- **[C] = Clear Error Counters:** Clears **all** errored second and BERT counters for all 28 links and the DS3 framer.
- **[N] = Next:** Allows you to view an additional 7 links (up to 28 total).
- **[I] = In Service:** Allows you to toggle between displaying all links or only those links that are currently in service.

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.

Before You Begin

The link must be in service and Clear T1/E1 must be disabled in order to perform BERT.

Start 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 22-13).

```

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/E1 ----- DS1/E1 -----
[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)
  
```

Figure 22-13. BERT Selection Submenu

The *BERT Selection* submenu has a list of several test patterns that you can choose.

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 command key indicated on the bottom of the menu. The selectable patterns and their corresponding command keys are as follows:

DS1/T1 BERT:

- **[2]** Unframed 2047
- **[3]** Unframed 2^15 (Inverted Pattern according to ITU 0.151)
- **[4]** Unframed 2^20

- **[5]** Unframed 2²³ (Inverted Pattern according to ITU 0.151)
- **[6]** Unframed 2¹¹ - 7 0's limits
- **[7]** Unframed 2¹⁵ - 7 0's limits
- **[8]** Unframed QRSS
- **[9]** Unframed 2²³ - 14 0's limits
- **[B]** Framed 2047
- **[C]** Framed 2¹⁵ (Inverted Pattern according to ITU 0.151)
- **[D]** Framed 2²⁰
- **[E]** Framed 2²³ (Inverted Pattern according to ITU 0.151)
- **[F]** Framed 2¹¹ - 7 0's limits
- **[G]** Framed 2¹⁵ - 7 0's limits
- **[H]** Framed QRSS
- **[I]** Framed 2²³ - 14 0's limits

Other Selections:

- **[O]** Off
- **[A]** All 2047 (All T1/E1 links generate 2047 Bert Pattern)
- **[S]** System 2047 (BERT -> Link and BERT -> Backplane)

3. Press **X** to start the test.
 4. At the prompt, *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 *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.
-

Start LIU BERT Test

To perform BERT for the LIU:

6. From the *Diagnostics Manager* submenu, place your cursor on the *T3 Framer* field and press **B**. The Liu Bert submenu displays ([Figure 22-14](#)). The LIU BERT pattern is 2¹⁵-1.

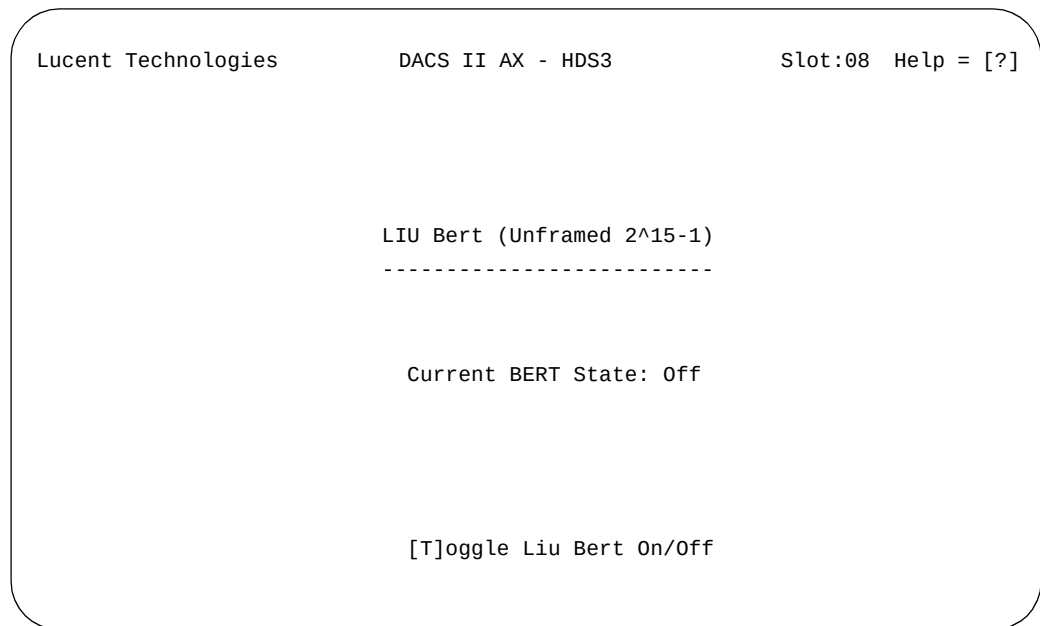


Figure 22-14. LIU Bert Submenu

7. Press **T** to toggle LIU BERT *On*.
8. Press **X** to start the test.

9. 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.
10. From the *LIU BERT* submenu, press **<Esc>** twice to return to the *Diagnostics Manager* submenu.

Stop LIU BERT Test

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.
-

Status

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 22-15](#)).

```

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]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 22-15. 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 15-minute Performance 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 interrupted.

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 22-16](#)).

```

Lucent Technologies          DACS II AX - HDS3          Slot:08   Help
= [?]

                                HDS3 Framer Status Display

                                Error
                                State  Sec
-----
Red Alarm.....: Off    0    P-Bit Parity Error.: 0
Loss of Signal.....: Off    0    C-Bit Parity Error.: 0
Out of Frame.....: Off    0    Far End Block Error: 0
AIS Indication.....: Off    0    Line Code Violation: 0
Receive Idle Pattern: Off    0    Framing Error.....: 0
Far End Rcv Failure.: Off    0    Excessive Zeros....: 0
CFA Indication.....: Off    0
C-Bit Identification: Off          Errored Seconds....: 564
Mismatch Shadow.....: Off          (including LIU)

[C]lear Counters    [R]eset Framer    [L]iu Monitor

----- Hit key 1 thru 8 to insert an error in TX DS3 -----
[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
  
```

Figure 22-16. HDS-3 Framer Status Display

**HDS-3 Framer
Status Display
Field Descriptions**

From the *HDS-3 Framer Status* display, the only action that is available is pressing **C** to clear the counters for the T3 Framer.

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: Displays the number incorrect parity bits that have been detected since the last counter reset.

C-Bit Parity Error: Displays the number of C-Bit parity errors in DS3 to DS3 multiplexing that have been detected since the last counter reset.

Far End Block Error: Displays the number of Far End Block Errors that have been detected since the last counter reset. A Far End Block Error indicates a remote device that has errors.

Line Code Violation: Displays the number of Line Code violations that have been detected since the last counter reset.

Framing Error: Displays the number of Framing Errors that have been detected since the last counter reset. Framing Errors are defined as those times that the receive data stream did not meet pre-set framing criteria.

Excessive Zeros: Displays the number of excess zeros that have been detected in the data stream since the last counter reset.

Errored Seconds (including LIU): Displays the number of errored seconds that have occurred since the last counter reset.

Display or Clear G.826 Statistics

- Purpose** This status screen displays performance statistics for the selected T1/E1 link for the duration of time that the link is up and running.
- Before You Begin** The G.826 Statistics Display is not accessible for E1 links without CRC or T1 links with D4 framing.
- Procedure** To access the G.826 Statistics screen:
- From the *T1/E1 Link Status* submenu, press **G**. The G.826 Statistics menu displays ([Figure 22-17](#)).

```
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 22-17. 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 Block Error: An errored block not occurring as part of a severely errored second. This field displays the number of background block errors 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 Block Error 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.

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 T1/E1 Framer

Purpose 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.

Before You Begin



WARNING:

Re-initializing the framer will cause data to be momentarily interrupted for the selected link.

Procedure

To re-initialize the framer:

1. From the *T1/E1 Link Status* submenu, press **I** to re-initialize the framer. The following message appears: *Reset and re-configure the framer? Are you sure (Y/N)?*
 2. Press **Y**. The T1/E1 framer will be re-initialized, and you are returned to the *T1/E1 Link Status* submenu. If you 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 command 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 command 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

Loop Types

The loop types for the Hybrid DS-3 modules are shown in [Figure 22-18](#). Loop types are described in [Loop Selection Screen Field Descriptions: page 22-54](#).

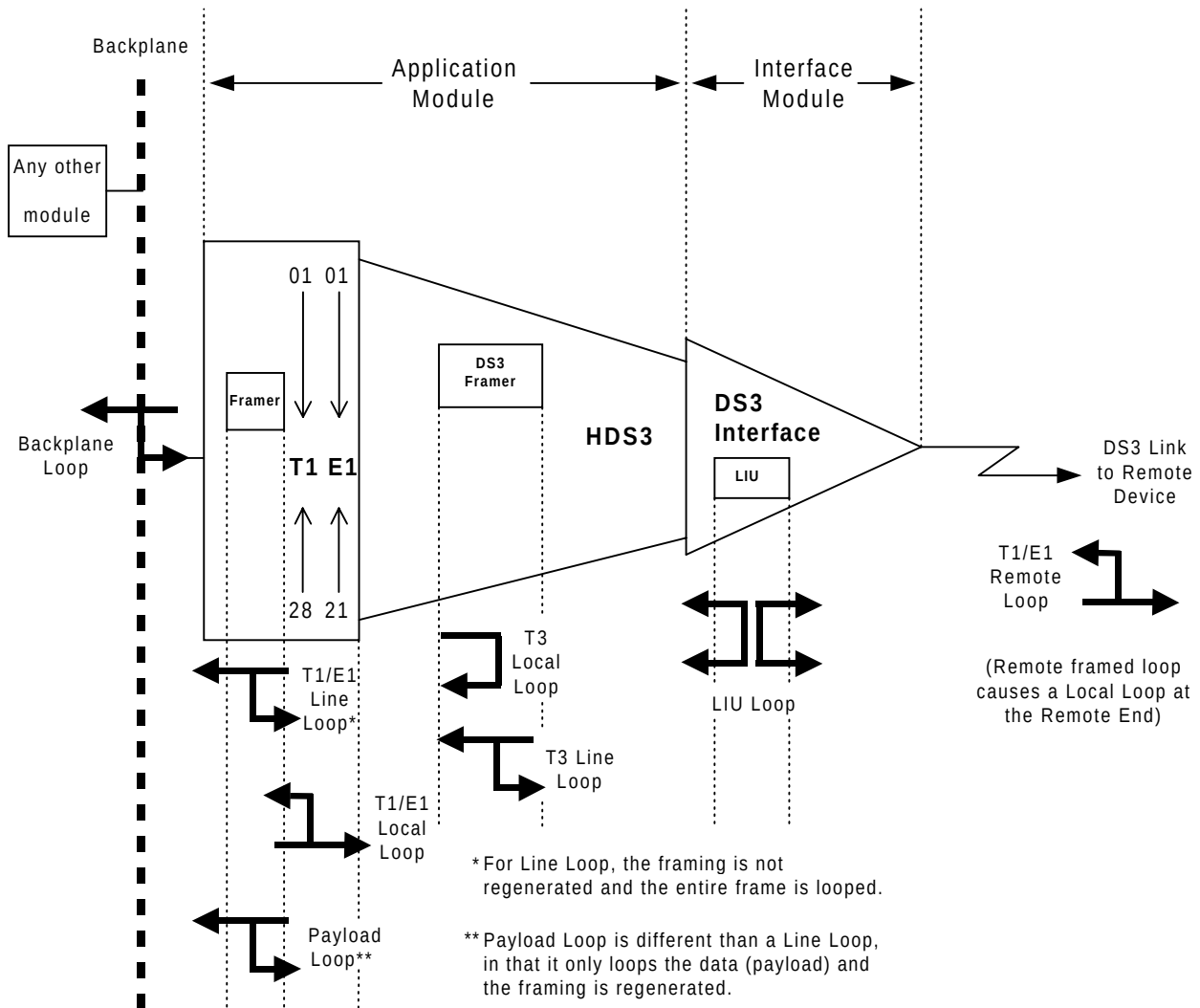


Figure 22-18. Hybrid DS-3 Module Loops

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 22-19](#)).

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 22-19. 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 command 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
4. Once you have selected a loop, press **X** to enable it. The following message appears: *Process Loop Command? Are you sure (Y/N)?*
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 HDS3
Framer/LIU
Diagnostic Loop**

To select a HDS3 Framer/LIU diagnostic loop:

1. From the *Diagnostics Manager* submenu, move your cursor to the *HDS3 Framer* field and press **L**. The T3 Framer/LIU Loop Selection Screen displays ([Figure 22-20](#)).

```
Lucent Technologies      DACS II AX - HDS3      Slot:08      Help = [?]  
  
T3 Framer/LIU Loop Selection Screen  
-----  
Loop Type: Off  
  
Loop Type :  [O]ff  [L]ocal  [I]ne  [U]
```

Figure 22-20. 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 command 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 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

Purpose 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.

Before You Begin ESF Statistics are not applicable for D4-framed links.

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 22-21](#)).

 **NOTE:**
 ESF Statistics can also be displayed from the T1/E1 Link Status submenu by pressing **S**.

```

Lucent Technologies          DACS II AX - HDS3          Slot:08   Help = [?]

                                ESF Statistics For Link#: 1

Register                      Curr  24 Hr
-----
Errored seconds.....: 1      0
Failed seconds (UAS)....: 0      0
Severely errored seconds: 1      0
Bursty errored seconds.: 0      0
Loss of frame count.....: 0      0
Time in interval.....: 264
# Valid intervals.....: 0
ESF status.....: 00000000
  
```

Figure 22-21. 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.

15-Minute Performance Registers

Purpose The *15-Minute Performance 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.

Before You Begin ESF Statistics are not applicable for D4-framed links.

View ESF Statistics To view 15-Minute Performance Registers:

1. From the *Diagnostics Manager* submenu, place your cursor on the applicable link and press **R**. The *15-Minute Performance Registers* ([Figure 22-22](#)) for the selected link appears.

 **NOTE:**
 15-Minute Performance Registers can also be displayed from the T1/E1 Link Status submenu by pressing **R**.

Lucent Technologies

DACS II AX - HDS3

Slot:08

Help = [?]

15-Minute Performance 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 22-22. 15-Minute Performance Registers Display

2. Press **N** to view the next 48 intervals.

**15-Minute
Performance
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.

1. 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.

```

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 04        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      ERR       16         Off      NA       Off          0          0
-----+-----+-----+-----+-----+-----+-----+-----

[B]ert          [L]oop
[E]xpose        [S]tatistics (ESF)    15-min Performance [R]egisters
[C]lear counters [N]ext                [I]n service (toggle view)

```

2. 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 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 22-24](#)).

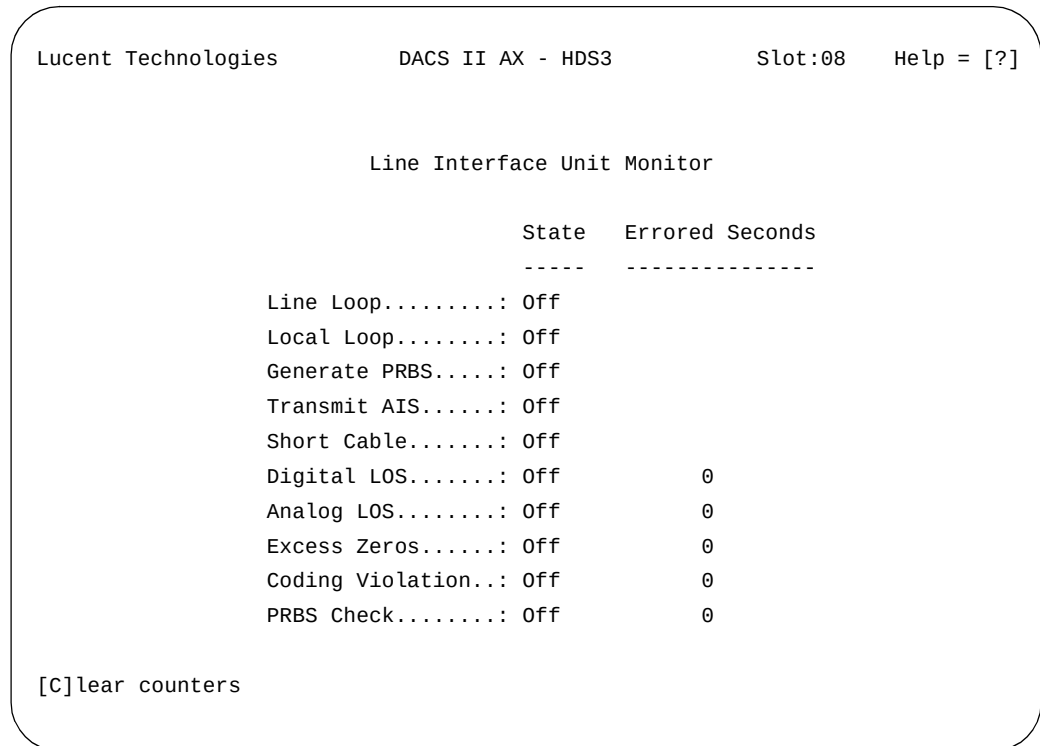


Figure 22-24. Line Interface Unit Monitor Display



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.

Local Loop: *On* indicates that an LIU local loop has been enabled.

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 (± 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 observe the status of Pulse Coded Modulation (PCM) signalling for the Hybrid DS-3 module's configured links.

To monitor control signals:

1. From the *Diagnostics Menu*, select *Monitor Control Signals*. The following menu appears:

The screenshot shows a terminal window with the following text:

```
Lucent Technologies          DACS II AX - HDS3          Slot:08   Help = [?]  
  
PCM Signalling Display Menu  
-----  
  
Link:02  
  
  
  
  
  
  
  
  
  
Select another link = [Enter key]      Select previous link = [B key]  
[D]isplay Control Signals
```

Figure 22-25. PCM Signalling Display Menu.

2. From the PCM Signalling Display Menu, press **<Enter>** to toggle to the link number you want to view.

3. Press **D**, and the PCM Signalling Display Menu appears ([Figure 22-26](#)).

Lucent Technologies			DACS II AX - HDS3			Slot:08	Help = [?]
Link:2			PCM Signalling Display Menu				
Chls	To Link	To Bus	Chls	To Link	To Bus		

FRAME							
01	A_C_	A_C_	16	A_C_	A_C_		
02	A_CD	A_CD	17	A_CD	A_CD		
03	AB__	AB__	18	AB__	AB__		
04	AB_D	AB_D	19	AB_D	AB_D		
05	ABC_	ABC_	20	Data	Data		
06	ABCD	ABCD	21	Data	Data		
07	__D	__D	22	N/A	N/A		
08	__C_	__C_	23	N/A	N/A		
09	_CD_	_CD_	24	N/A	N/A		
10	_B__	_B__	25	N/A	N/A		
11	_B_D	_B_D	26	N/A	N/A		
12	_BC_	_BC_	27	N/A	N/A		
13	ABC_	ABC_	28	N/A	N/A		
14	A__	A__	29	N/A	N/A		
15	A_D	A_D	30	N/A	N/A		
CAS							

Figure 22-26. PCM Signalling Display Menu

This screen will vary for T1 and E1 links.

PCM Signalling Display Menu Field Descriptions

Link: Displays the link number for which the control signals are shown.

DS0: (T1 link) Displays the time slot (DS0) for which the control signals are being reported.

Chls: (E1 Link) Displays the channel for which the control signals are being reported.

To Link: Displays the status of signalling towards the link. *N/A* indicates that the DS0 has not been mapped, or that it is a signaling or framing channel such as E1 CAS. *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. *N/A* indicates that the DS0 has not been mapped or that it is a signaling or framing channel such as E1 CAS. *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 22-27](#), 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 interrupted.

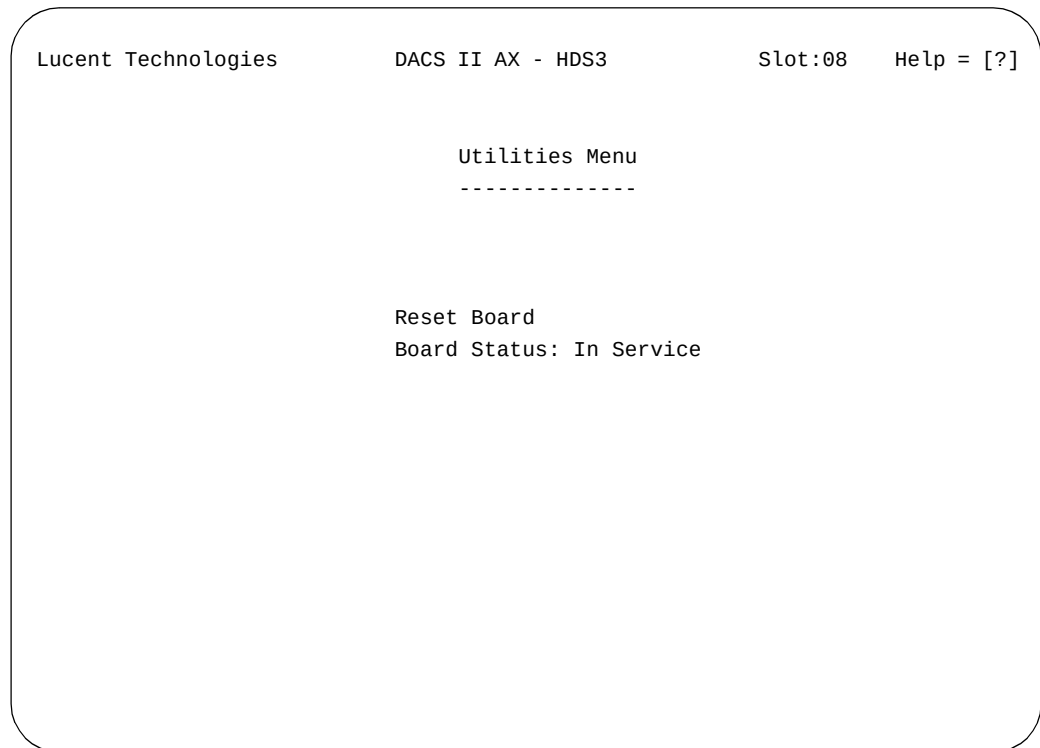


Figure 22-27. Utilities Menu

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: *Reset this HDS3 board? Are you sure (Y/N)?*
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:

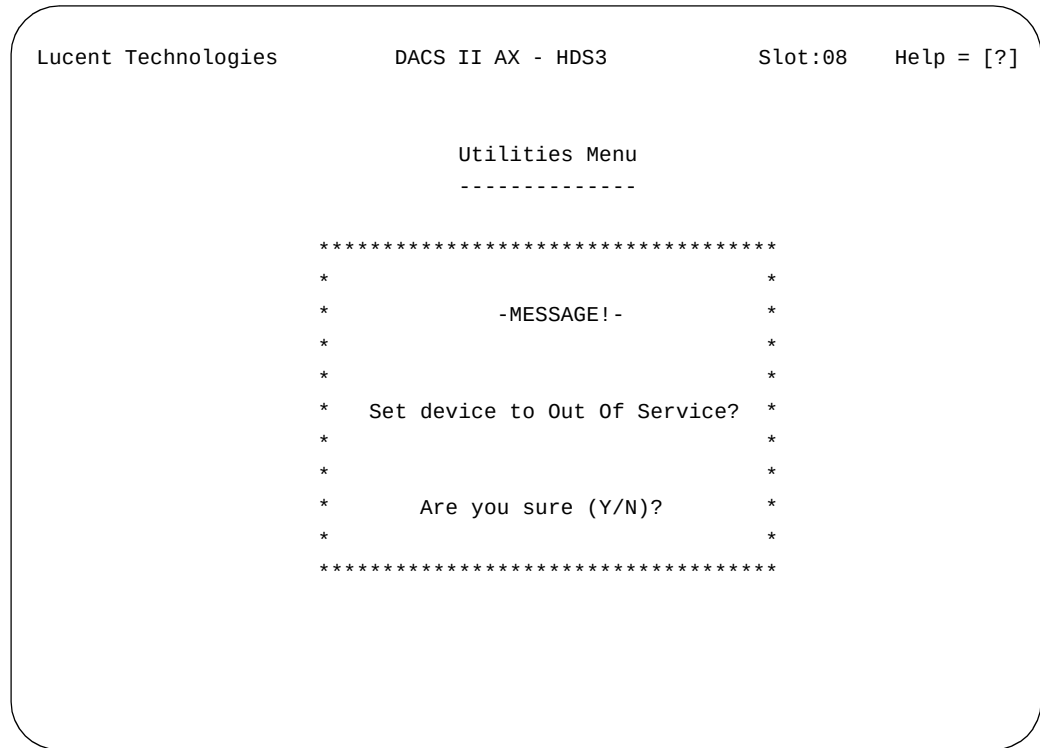


Figure 22-28. Board Status Screen

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:

```
Lucent Technologies          DACS II AX - HDS3          Slot:08    Help = [?]  
  
          Utilities Menu  
          -----  
  
*****  
*                                                    *  
*                    -MESSAGE! -                    *  
*                                                    *  
*                                                    *  
* Set device to In Service?  **Device Will Reset** *  
*                                                    *  
*                                                    *  
*                    Are you sure (Y/N)?              *  
*                                                    *  
*****
```

Figure 22-29. 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 22-30](#)) displays.

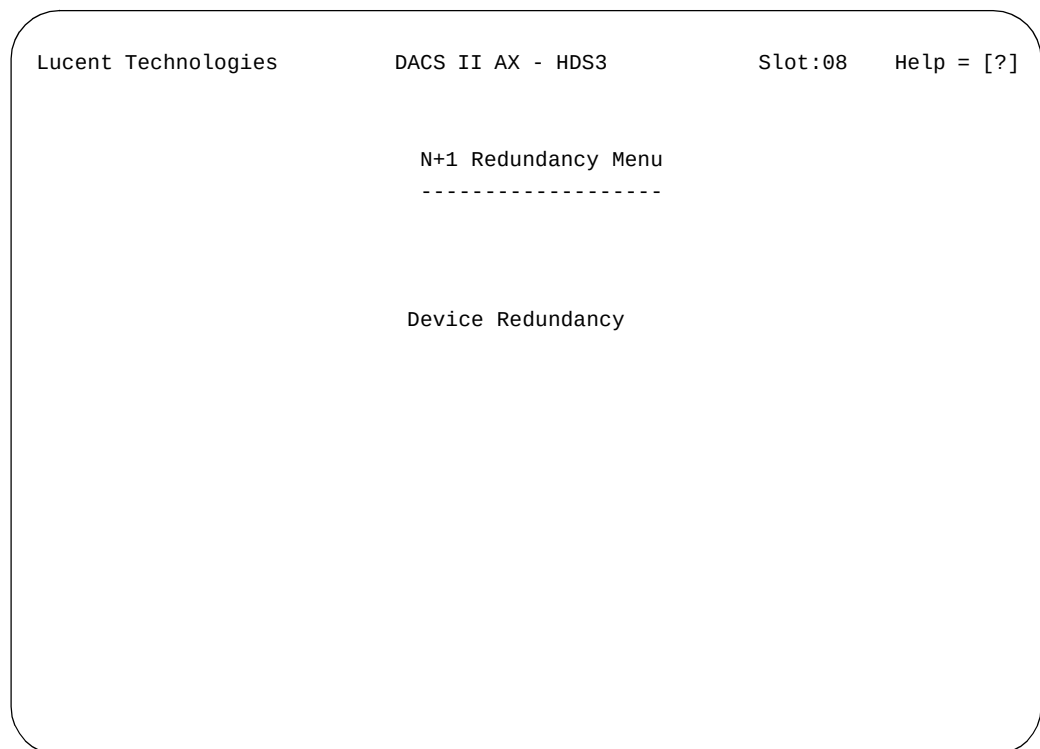


Figure 22-30. Hybrid DS-3 Module N+1 Redundancy Menu

2. Select *Device Redundancy*. The N+1 Redundancy Status Menu appears ([Figure 22-31](#)).

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 22-31. N+1 Redundancy Status Menu

The *N+1 Redundancy Status* menu is a read-only screen. To clear counters, press **C**.

**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 22-32](#)). The *About HT3 Module* display is a read-only screen.

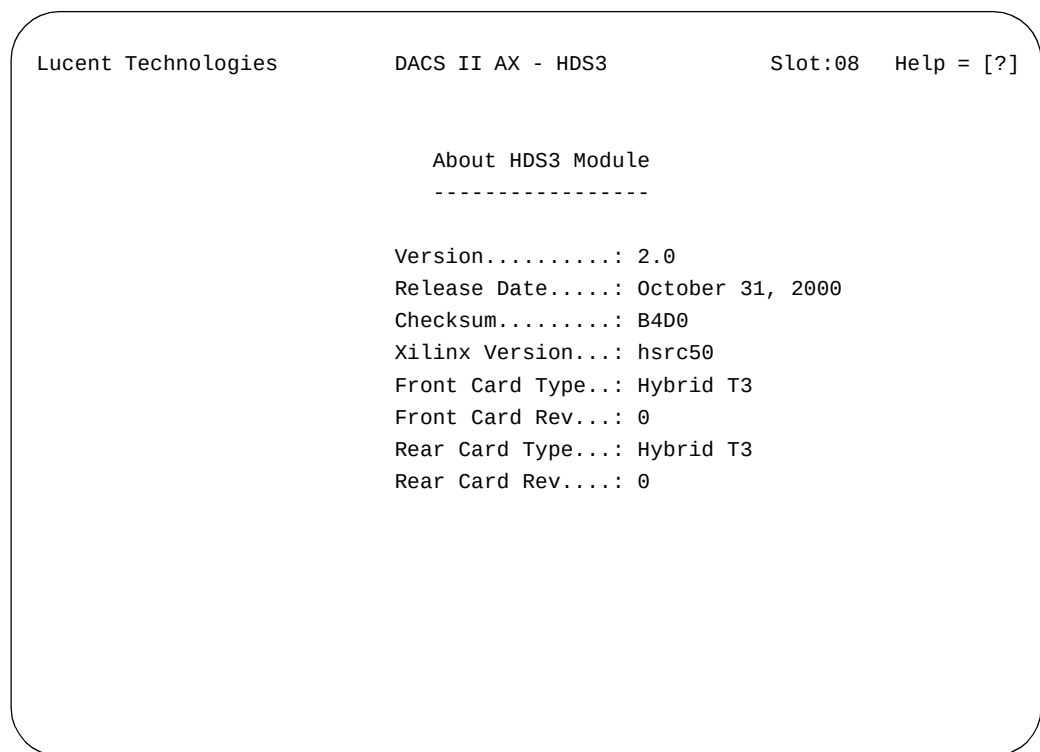


Figure 22-32. About HT3 Module Display

**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.

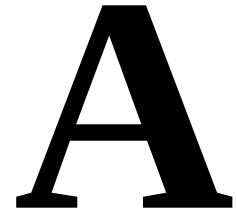
Front Card Type: Displays the type of Application Module in the system.

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.

Software Upgrade



Contents

■ Upgrade Overview	A-3
■ Upgrading the SMC Software	A-4
Overview	A-4
Before you begin	A-4
Displaying the Current SMC Software Version	A-4
Upgrade SMC Software Procedure	A-5
■ Upgrading an Application Module	A-6
Overview	A-6
Before you begin	A-6
Displaying the Application Module's Current Software Version	A-6
Clock Source	A-6
Upgrade Application Module Procedure	A-8

■ Telnet	A-10
Procedure	A-10
■ Multiple Telnet Sessions	A-11
Number of Telnet Sessions	A-11
Application Module Restrictions	A-11
DACS II AX Backplane Restrictions	A-12
Example of Multiple Telnet Sessions	A-13
Related and Unrelated Screens	A-13
Menu Access Chart	A-14

Upgrade Overview

This section provides general directions for upgrading the SMC and the application modules.

The *DACS II AX 4/11 Release 10.0 Software Release Description* provides detailed instructions for upgrading to Release 10.0.

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: wbd040e.bin

Download Status: Idle

File Size: 402680

Slot#	Type	Program Version	Device State
01	Octal T1/E1	4.0	Standby
02	Octal T1/E1	4.0	Online
03	Octal T1/E1	4.0	Online
04	Router	Router 1.02	Online
05	-----	-----	Not Present
06	-----	-----	Not Present
07	-----	-----	Not Present
08	-----	-----	Not Present
09	-----	-----	Not Present
10	DS3	DS3 4.0	Online
11	DS3	DS3 4.0	Standby

PSX ProtectionSwitch PSX 2.00 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 *wbd0310q.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 [P]ort/Link Cfg [T]oggle Alarm Contacts
N+1 Device Redundancy: Switch[O]ver [R]estore [E]xpose
```

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. 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
NODE SUMMARY	
CONNECTION MAPS MANAGER	
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
SYSTEM CONFIGURATION	
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
EVENTS	
Monitor Events	Accessible
Display Event Log	Accessible
Event Configuration	Accessible
UTILITIES	
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
ABOUT	
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
CONFIGURATION	Protected/View only
DIAGNOSTICS	Accessible
ADVANCED UTILITIES	
Options	Accessible
Board Status	Accessible
Buffer Watch	Accessible
Reset Quad High Speed Board	Accessible
Monitor System Manager Clock	Accessible
MEMORY MANAGEMENT	
Dump Memory	Accessible
Change Memory	Accessible
Display Queues	Accessible
TIME SLOT ASSIGNMENT DISPLAY	
Write to Backplane Display	Accessible
Read from Backplane Display	Accessible
SYSTEM MANAGER INTERFACE	Accessible
DISPLAY RESOURCE CHANGES	Accessible
ABOUT	Accessible

Table A-4. Quad T-1 Multi-user Menus

Menu	Accessibility
CONFIGURATION	Protected/View only
STATISTICS	
ESF Statistics	Accessible
ESF Registers	Accessible
DIAGNOSTICS	Accessible
ADVANCED UTILITIES	Accessible
OPTIONS	Accessible
Board Status	Accessible
Buffer Watch	Accessible
Monitor System Manager Clock	Accessible
Reset Quad T-1 Board	Accessible
Debug Event	Accessible
VOICE DEBUGGER	Accessible
Voice Control Signal Display	Accessible
Test Voice Signals	Accessible
MEMORY MANAGEMENT	Accessible
Dump Memory	Accessible
Change Memory	Accessible
FRAMER MANAGEMENT	Accessible
Dump Framer Registers	Accessible
Dump PCM Control Registers	Accessible
ESF MESSAGE DRIVER	Accessible
TIME SLOT ASSIGNMENT DISPLAY	Accessible
SYSTEM MANAGER INTERFACE	Accessible
DISPLAY RESOURCE CHANGES	Accessible
ABOUT	Accessible

Table A-5. T3 Multi-user Menus

Menu Name	Accessibility
CONFIGURATION	
T1 Configuration Manager	Accessible
T1 Channel Configuration	Protected/View only
T3 Port Configuration	Protected/View only
Options	Protected/View only
DIAGNOSTICS	
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
UTILITIES	
System Manager Interface	Accessible
Reset Board	Accessible
Buffer Watch	Accessible
Dump Memory	Accessible
Change Memory	Accessible
Display Queues	Accessible
Display Resource Changes	Accessible
ABOUT	Accessible

Table A-6. Octal Voice EM Multi-user Menus

Menu Name	Accessibility
CONFIGURATION	Protected/View only
DIAGNOSTICS	Accessible
UTILITY	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
ABOUT	Accessible

Table A-7. Octal T1/E1 Multi-user Menus

Menu Name	Accessibility
CONFIGURATION	Protected/View only
Links Configuration	Protected/View only
DIAGNOSTICS	Accessible
Bert Select	Accessible
Loop Select Screen	Accessible
E1/T1 Link Status	Accessible
ESF Statistics	Accessible
ESF Registers	Accessible
G.826 Statistics	Accessible
Link Timeslot Profile Display	Accessible
Active TSFM Display	Accessible
Debug Backplane Connection	Accessible
Complete TSFM Display	Accessible
Registers Dump	Accessible
Backplane Check	Accessible
System Status	Accessible
UTILITIES	Accessible
System Manager Interface	Accessible
Resource Display	Accessible
Buffer Watch	Accessible
Dump Memory	Accessible
Change Memory	Accessible
Display Queues	Accessible
Tsfm - Reload Cfg	Accessible
Tsfm - Refresh	Accessible
Tsfm - Verify	Accessible
Tsfm & Framers Refresh	Accessible
Options	Accessible
Reset Device	Accessible
Board Status	Accessible
ABOUT	Accessible

Contents

■ System Manager Interface	B-3
Ethernet AUI Port	B-3
■ System Manager Interface	B-3
Ethernet 10Base-T port	B-3
Terminal Port	B-3
Phone Line	B-3
■ Application Module Interfaces	B-5
Quad High Speed Interfaces	B-5
Quad Port DS-1 Interface	B-6
Quad OCU Data Port Interface	B-7
Octal T1/E1 Interface	B-8
Octal Voice Rear Interface Cards - E&M, FXO, and FXS	B-10
■ DB-25 to V.35 Cable Adapters (Optional)	B-13
■ Octal High Speed Cables	B-15
Octal High Speed Cable Adapter Pin-outs.	B-16

- Cables for Redundancy [B-22](#)
 - Cable for Broadband Redundancy [B-22](#)
 - Cable for Octal T1/E1 Redundancy [B-23](#)
 - Cable for N+1 Protection Switch [B-25](#)

System Manager Interface

Ethernet 10Base-T port The Ethernet 10Base-T port provides an RJ45 connector for connection using twisted pair cabling.

Table B-1. Ethernet 10Base-T

10Base-T (RJ45)	
1 transmit pair	TX+
2 transmit pair	TX-
3 receive pair	RX+
4	not used
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-2. 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-3. 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-4. 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-5. 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-6. QOCU 56/64 Kbps DDS Port (RJ48S)

Pin	Signal	To/From 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

Cable should use male 50 pin connector (Amp Champ 552726-1 or equivalent) to mate with rear board. Cable should be shielded and provide drain wire for connection of shield to rear bezel frame ground.

Table B-7. Octal T1/E1 Pinout

Pin	Link #	Signal	To/From AX	Colors
1	1	Transmit ring	From	Blu/Wh
26	1	Transmit tip	From	Wh/Blu
2	1	Receive ring	To	Or/Wh
27	1	Receive tip	To	Wh/Or
3	-	-	-	Grn/Wh
28	-	-	-	Wh/Grn
4	2	Transmit ring	From	Brn/Wh
29	2	Transmit tip	From	Wh/Brn
5	2	Receive ring	To	Gr/Wh
30	2	Receive tip	To	Wh/Gr
6	-	-	-	Blu/Rd
31	-	-	-	Rd/Blu
7	3	Transmit ring	From	Or/Rd
32	3	Transmit tip	From	Rd/Or
8	3	Receive ring	To	Grn/Rd
33	3	Receive tip	To	Rd/Grn
9	-	-	-	Brn/Rd
34	-	-	-	Rd/Brn
10	4	Transmit ring	From	Gr/Rd
35	4	Transmit tip	From	Rd/Gr
11	4	Receive ring	To	Blu/Blk
36	4	Receive tip	To	Blk/Blu
12	-	-	-	Or/Blk
37	-	-	-	Blk/Or
13	5	Transmit ring	From	Grn/Blk
38	5	Transmit tip	From	Blk/Grn
14	5	Receive ring	To	Brn/Blk
39	5	Receive tip	To	Blk/Brn
15	-	-	-	Gr/Blk
40	-	-	-	Blk/Gr
16	6	Transmit ring	From	Blu/Yel
41	6	Transmit tip	From	Yel/Blu
17	6	Receive ring	To	Or/Yel
42	6	Receive tip	To	Yel/Or

Table B-7. Octal T1/E1 Pinout (Continued)

Pin	Link #	Signal	To/From AX	Colors
18	-	-	-	Grn/Yel
43	-	-	-	Yel/Grn
19	7	Transmit ring	From	Brn/Yel
44	7	Transmit tip	From	Yel/Brn
20	7	Receive ring	To	Gr/Yel
45	7	Receive tip	To	Yel/Gr
21	-	-	-	Blu/Viol
46	-	-	-	Viol/Blu
22	8	Transmit ring	From	Or/Viol
47	8	Transmit tip	From	Viol/Or
23	8	Receive ring	To	Grn/Viol
48	8	Receive tip	To	Viol/Grn
24	-	-	-	Brn/Viol
49	-	-	-	Viol/Brn
25	-	-	-	Gr/Viol
50	-	-	-	Viol/Gr

**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-8. Octal Voice - E&M

Pin	Channel #	Signal	To/From 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-8. Octal Voice - E&M (Continued)

Pin	Channel #	Signal	To/From 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
<i>P2 Connector</i>			
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-9. Octal Voice - FXO and FXS

Pin	Channel #	Signal	To/From 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
<i>P2 Connector</i>			
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-10. 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-10. 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
EIA-232-M/M Straight-through Cable. 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.
EIA-530-M/M Straight-through Cable. 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.
EIA-530-M/M Cross-over Cable. 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.
EIA-530-A M/M Straight-through Cable. 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.
EIA-530-A M/M Cross-over Cable. 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.
EIA-422 M/M Straight-through Cable. 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.
ITU-V.35 M/M Straight-through Cable. 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.
ITU-V.35 M/M Cross-over Cable. 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.
ITU-X.21 M/M Straight-through Cable. 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-11. EIA-232 M/M Straight-through Cable

PIN (from 26-pin male)	SIGNAL	PIN (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-12. EIA-530 M/M Straight-through Cable.

PIN (from 26-pin male)	SIGNAL	PIN (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 DD (A)	8
16	RX LINE SIGNAL DETECTOR 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 (DTE SOURCE) DA (A)	24
26	TX SIGNAL ELEMENT TIMING (DTE SOURCE) DA (B)	11
22	TX SIGNAL ELEMENT TIMING (DCE SOURCE) DB (A)	15
23	TX SIGNAL ELEMENT TIMING (DCE SOURCE) DB (B)	12
24	RX SIGNAL ELEMENT TIMING (DCE SOURCE) DD (A)	17
25	RX SIGNAL ELEMENT TIMING (DCE SOURCE) DD (B)	9
7	SIGNAL GND AB	7
1	SHIELD	1



Table B-13. EIA-530-A M/M Straight-through Cable

PIN (from 26-pin male)	SIGNAL	PIN (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 DD (A)	8
16	RX LINE SIGNAL DETECTOR 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 (DTE SOURCE) DA (A)	24
26	TX SIGNAL ELEMENT TIMING (DTE SOURCE) DA (B)	11
22	TX SIGNAL ELEMENT TIMING (DCE SOURCE) DA (A)	15
23	TX SIGNAL ELEMENT TIMING (DCE SOURCE) DA (B)	12
24	RX SIGNAL ELEMENT TIMING (DCE SOURCE) DB (A)	17
25	RX SIGNAL ELEMENT TIMING (DCE SOURCE) DB (B)	9
7	SIGNAL GND AB	7
21	SIGNAL COMMON AC	23
1	SHIELD	1



Table B-14. EIA-422 M/M Straight-through Cable

PIN (from 26-pin male)	SIGNAL	PIN (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-15. ITU-V.35 M/M Straight-through Cable

PIN (from 26-pin male)	SIGNAL	PIN (to 34-pin male)
4	RTS 105	C
5	CTS 106	D
6	DSR 107	E
20	DTR 108	H
8	RECEIVED LINE SIGNAL 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 (DTE SOURCE) 113 (A)	U
26	TX SIGNAL ELEMENT TIMING (DTE SOURCE) 113 (B)	W
22	TX SIGNAL ELEMENT TIMING (DCE SOURCE) 114 (A)	Y
23	TX SIGNAL ELEMENT TIMING (DCE SOURCE) 114 (B)	AA
24	RX SIGNAL ELEMENT TIMING (DCE SOURCE) 115 (A)	V
25	RX SIGNAL ELEMENT TIMING (DCE SOURCE) 115 (B)	X
7	SIGNAL GND 102	B
1	SHIELD	A



Table B-16. ITU-X.21 M/M Straight-through Cable

PIN (from 26-pin male)	SIGNAL	PIN (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 TIMING S (A)	6
23	SIGNAL ELEMENT TIMING S (B)	13
7	SIGNAL GND G	8
1	SHIELD	1

Cables for Redundancy

Cable for Broadband Redundancy

Cable for Broadband 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 broadband module. This cable is used for hybrid DS-3, DS-3, and STS-1 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-17. 50-Pin M to 50-Pin M cat3 Cable for Octal T1/E1 Redundancy

PIN (from 50-pin male)	SIGNAL	PIN (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-17. 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-18. DB9 TO DB9 Straight-through Cable for N + 1 Protection Switch

PIN (from male)	SIGNAL	PIN (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

Contents

■ Overview	C-5
Purpose	C-5
Intended Audience	C-5
Background Information	C-5
Managing the DACS II AX	C-5
SNMP Interface	C-5
SNMP MIB Browser	C-5
■ DACS II AX Enterprise MIB	C-6
Contents	C-6
Read-Write Parameters	C-6
Read-Only Parameters	C-6
■ Interface Characteristics	C-7
DACS II AX Agent Characteristics	C-7
Network Manager Characteristics	C-7
■ Interface Design	C-9
DACS II AX Enterprise MIB Layout	C-9
Changes in this Release	C-9
■ Enterprise MIB Tree	C-11
■ System Manager Branch	C-12

System Manager MIB Module	C-12
DACS II AX Provisioning Guidelines	C-13
System Resource Tables	C-13
Resource Alarm Table	C-15
Slot Configuration Table	C-16
■ Slot Configuration Commands	C-18
Update Slot Configuration	C-18
Delete Slot Configuration	C-19
NDR Switchover	C-19
NDR Restore	C-19
System Profile Group	C-19
■ System Clock	C-21
System Date & Time	C-21
Update System Time	C-21
System Clock Source	C-22
Update System Clock Source	C-22
Update Clock Source Mode	C-23
■ Connections	C-24
Connection Map Definition Table	C-25
■ Connection Map Commands	C-26
Activating a Connection Map	C-26
Updating a Connection Map	C-26
Saving a Connection Map	C-27
Copying a Connection Map	C-27
Deleting a Connection Map	C-27
Connection Configuration Tables	C-27
Add Connection Group	C-29
System Connection Table	C-29
Active Connection Table	C-29
■ Connection Configuration Commands	C-30
Adding a Connection	C-30
Updating a Connection	C-31
Deleting a Connection	C-32
N+1 Redundancy	C-32
Device Download Table	C-35
Downloading Device Software	C-35

■ Devices Branch	C-36
■ Octal T1/E1 Device Branch	C-37
Octal T1/E1 Configuration Table	C-37
Updating an Octal T1/E1 Link	C-38
Copying an Octal T1/E1 Link	C-39
■ T3 Device Branch	C-40
T3 Configuration Table	C-40
Updating a T3 Port	C-41
T3 T1 Configuration Table	C-41
Updating a T1 Link	C-43
Copying a T1 Link	C-43
■ STS1 Device Branch	C-44
STS1 Mapper Configuration Table	C-44
Updating an STS1 Link	C-45
STS1 T1/E1 Link Configuration Table	C-46
Updating an STS1 T1/E1 Link	C-47
Copying an STS1 T1/E1 Link	C-47
■ HDS3 Device Branch	C-48
HDS3 Configuration Table	C-48
Updating an HDS3 Port	C-51
HDS3 T1/E1 Link Configuration Table	C-51
Updating an HDS3 T1/E1 Link	C-53
Copying an HDS3 T1/E1 Link	C-53
■ Traps Branch	C-54
■ Performance Monitoring Branch	C-55
DS1/E1 ESF Current Statistics	C-55
DS1/E1 ESF 24-Hour Statistics	C-57
DS1/E1 G.826 Statistics	C-58
■ Diagnostics Branch	C-60
DS1/E1 Link Test Statistics	C-61
■ SNMPv1 Traps	C-64
■ Provisioning Traps	C-66
Connection Event Trap	C-66
Connection Map Manager Trap	C-66
Slot Configuration Trap	C-66
Map Copy Trap	C-66

Bulk Connection Purge Trap	C-66
NDR Group Status Trap	C-66
■ Alarm Traps	C-67
Alarm Trap Type Tables	C-67

Overview

Purpose	This appendix describes the DACS II AX Enterprise MIB. The SNMP interface to the DACS II AX provides network managers with an easy-to-use navigational graphic environment that allows for provisioning of the DACS II AX SNMP configurable data and for monitoring DACS II AX status.
Intended Audience	The intended audience of this appendix is network managers and software engineers that will design and implement an SNMP Network Management System (NMS) interface. It is assumed that the reader is familiar with and has a basic understanding of SNMP table manipulation and row creation.
Background Information	This appendix does not explain the SNMP v1 protocol or Structure of Management Information (SMI). Refer to RFCs 1155 and 1157 for those standards.
Managing the DACS II AX	The DACS II AX can be managed: ■ through an ASCII terminal session using either a Telnet session or a direct system terminal port, ■ or by an NMS via SNMP and the enterprise MIB. The DACS II AX supports an SNMP v1 agent that provides basic system resource monitoring, event notification, and provisioning.
SNMP Interface	SNMP uses the UDP protocol to send and receive data. Since UDP is an unreliable protocol both the request for information and the information being returned could be lost. Therefore most implementations specify that after a certain amount of time the request is resent if information is not received. SNMP can also be set up so that only certain devices are authorized to see and change information.
SNMP MIB Browser	Due to the complexity and format of some of the changeable table fields defined in the MIB, do not use an SNMP MIB browser to provision the DACS II AX.

DACS II AX Enterprise MIB

Contents

The DACS II AX enterprise MIB is made up of several MIBs, including:

- ERI-DNX-SMC-MIB
- ERI-DNX-OCTAL-T1E1-MIB
- ERI-DNX-T3-MIB
- ERI-DNX-STS1-MIB
- ERI-DNX-HDS3-MIB
- ERI-DNX-PERF-MONT-MIB.
- ERI-DNX-LINK-TEST-MIB.

Read-Write Parameters

The set of read-write parameters allows for:

- basic slot configuration
- circuit/connection set-up for all 5 configurable maps
- system clock source configuration
- Octal T1/E1, DS3, STS1, and Hybrid DS3 application module configuration (no provisioning is possible for older application modules such as the Quad T1).

Read-Only Parameters

A set of read-only parameters allows for monitoring system status and alarms as well as performing limited diagnostics.

Interface Characteristics

The interface between the DACS II AX Agent and NMS should use SNMPv1 protocol to communicate, otherwise a completely efficient and valid exchange of information cannot be assured.

The DACS II AX Agent receives and transmits SNMP PDU messages that are encapsulated using UDP/IP as defined in RFC 768 and RFC 791 respectively. It receives and responds to SNMP v1 request messages using the standard UDP port 161, and reports unsolicited SNMP v1 Traps using the standard UDP port 162.

DACS II AX Agent Characteristics

- The DACS II AX Agent supports SNMP v1 protocol, as defined in RFC 1157, and a portion of applicable SNMP MIB-II variables, as defined in RFC 1213.
- The DACS II AX Agent also supports its own enterprise MIBs, which include ERI-DNX-SMC-MIB, ERI-DNX-OCTAL-T1E1-MIB, ERI-DNX-T3-MIB, ERI-DNX-STS1-MIB, ERI-DNX-HDS3-MIB, ERI-DNX-PERF-MONT-MIB and ERI-DNX-LINK-TEST-MIB.
- The DACS II AX Agent supports OIDs up to a maximum length of 128 octets.
- The DACS II AX Agent supports a maximum SNMP PDU size of 1444 bytes.
- The DACS II AX Agent supports up to 8 different community strings: 4 for read-only and 4 for read-write configured through the console. The current maximum community string length is 19 characters.
- The DACS II AX Agent supports up to 8 Trap Destination addresses configured through the console.

Network Manager Characteristics

To interact with the DACS II AX via a Network Management System (NMS), ensure that the following criteria are met:

- The NMS supports SNMP v1 protocol as defined in RFC 1157.
- The NMS receives and transmit SNMP PDU messages that are encapsulated using UDP/IP as defined in RFC 768 and RFC 791, respectively.
- The NMS recognizes SNMPv1 MIBs defined according to the SMIV1 as per RFC 1155.
- The NMS has the capability to send multiple variable-value pairs in a single SNMP SET Request PDU.
- The NMS includes the appropriate Command Status object as a variable in a SNMP SET Request PDU.

- The NMS does not include more than one Command Status object in a single SNMP SET Request PDU.
- The NMS provides a layer of security by incorporating a user login and password before allowing SNMP Configuration on the DACS II AX.

Interface Design

DACS II AX Enterprise MIB Layout

Currently, nine numbers represent the enterprise Object Identifier (OID). The Internet Assigned Numbers Authority (IANA) assigned the virent (644) to our sister company.

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1). virent(644).eri(2).dnx(4)

This is the current Enterprise OID used on the DACS II AX product. The DNX branch currently breaks down into five sub-trees: sysMGR(1), devices(2), traps(3), performance monitoring (4), and diagnostics (5).

Changes in this Release

The Release 9.3.1 MIB provided circuit connection provisioning capability through SNMP for the Octal T1/E1, DS3, STS-1, and hybrid DS3 modules.

The Release 10.0 MIB changes are as follows:

- New Software Download Table was added to support SNMP triggering of program downloads from the SMC to the Device cards.
- Redundancy branch was modified to support second Broadband Group and PSX Chassis configuration. Also, other configurable parameters were changed to allow Read/Write access via SNMP (NDR Enable/Disable and Broadband Group 1 Type configuration).
- SysView branch was renamed to SysMgr since "View" name was no longer applicable.
- New High-Level branches were added for Performance Monitoring and Diagnostics. New DACS II AX Performance Monitoring MIB was added which includes ESF Current, ESF 24 Hour, and G.826 Statistics Tables for all applicable DS1/E1 links in the system. A new DACS II AX Test MIB was added which includes a Test Table supporting Loop and BERT diagnostics and statistics for applicable DS1/E1 links in the system. (**NOTE:** Currently, these 4 tables will only work with Octal T1/E1 and HDS3 cards running with the latest 10.0 software versions.)
- Clock Source Object names were changed so that the Clock Source Configuration Table matches the console's System Clock Source Menu.
- Added new Set and Clear Alarm Trap codes for PSX Mismatch. Also added new Alarm Code for Device Warm Start Events.
- Updated NDR Status Trap to include 2nd Broadband Group status.

- Added New Line Types to Octal T1/E1 MIB to support T1 AMI Clear options for D4 and ESF
 - Added new configuration traps for Connection Configuration Events, Connection Map changes, and Slot Configuration Events.
 - Added additional Alarm Traps.
-

Enterprise MIB Tree

For this release, the Enterprise MIB tree has been updated to add two new branches (Performance Monitoring and Test). The major additions to the MIB are these branches along with a set of tables for each. New traps have also been added for Connection Configuration Events, Connection Map changes, and Slot Configuration Events.

Figure C-1 shows a high-level view of the Enterprise MIB tree for Release 10.

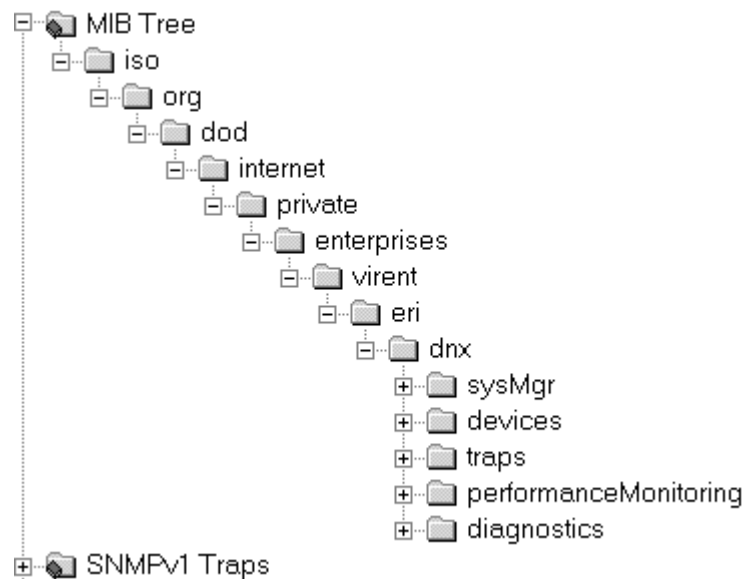


Figure C-1. Enterprise MIB Tree

System Manager Branch

System Manager MIB Module

The System Manager branch is where DACS II AX provisioning takes place. For Release 10, the major change to the System Manager Branch was adding an additional redundancy group (Broadband NDRG 2) to the redundancy branch. Figure C-4 shows a detailed view of the System Manager Branch.

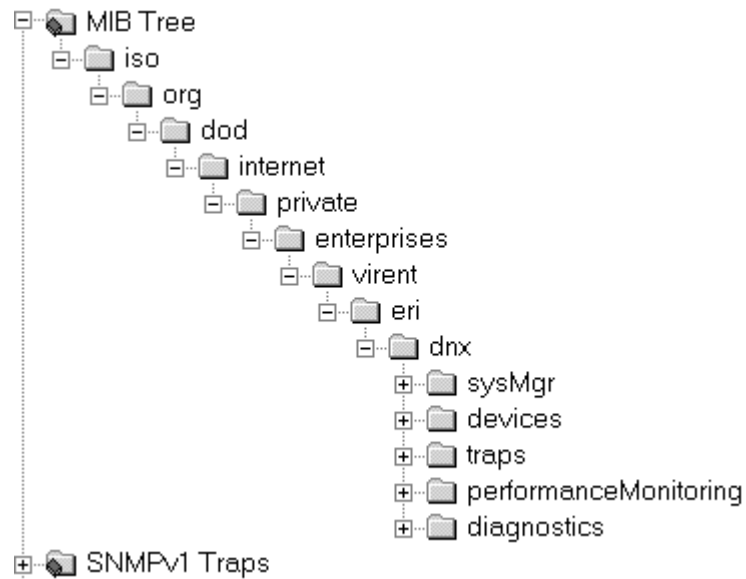


Figure C-2. System Manager Branch - Detailed View

DACS II AX Provisioning Guidelines

Most of the DACS II AX provisioning follows a common methodology whenever the SET Request is used to change parameter values. Modeled after the SNMPv2 textual convention of Row Status, nearly all DACS II AX configurable tables and data sets require a Command Status parameter as a variable in the PDU list. The Command Status will contain the desired action to be performed on the row entry or data set. The GET Response to the SET will replace the action code in the Command Status with a status indicating the results of the configuration changes through either a success or error code.

This convention allows the Agent to validate the data fields on a record basis prior to actually executing the changes. This is necessary since some fields are interdependent of each other. The Command Status also provides a method for more detailed error reporting rather than the standard SNMP error status and error index fields, which could be misleading when record validation is performed. This error reporting is especially useful when reporting data lockout conditions due to another user provisioning the same area of the system at time of the SNMP Request. Currently, the Agent is limited to processing a single record at a time and therefore the SET Request PDU should contain only one Command Status field. Any additional Commands would be interpreted as an invalid record format.

As a general rule, successful configuration changes by any user will result in an SNMP Trap sent to all configured Trap clients. Currently, eight trap destinations can be configured through the console menu. The Resource Alarm Trap and Resource Deleted Trap are not affected in this release. They are issued based on individual resource element events and not necessarily due to configuration changes. New configuration traps have been added for Connection Configuration Events, Connection Map changes, and Slot Configuration Events.

System Resource Tables

The Resource data currently supported through SNMP provides information on every configured system resource including slots, ports, channels, and devices. This information is represented in two SNMP Tables, the **Resource Table**, containing all the system resources, and the **Resource Alarm Table**, which contains only the resources in an alarm condition. The Resource data fields in both tables are all read-only and consist of the Resource Identifier, type of resource, current state and pre-defined alarm masks. The Resource State and various alarm masks are represented by 32-bit integer values that should be interpreted as separate bit field flags. These bit fields are interpreted differently based on the Resource Type. Note that bit 0 (zero) refers to the right-most bit. The NMS application designer must refer to the **Resource State** description provided in the MIB, which defines each bit field for each type of system resource.

Table C-1. Resource Table - System Resources

Field Name	SNMP Type	Size/Range	Access	Description
Resource Key	Integer	0-4294967295	read-only	Uniquely identifies a system resource. This number will be used throughout the system to identify a resource. The entries are too numerous to list here; see the actual MIB file for the resource codes.
Resource Address	Display String	4 digits (1-255)	read-only	This is an ASCII text version of the resource key. The strings have the general form of <letter>x-x-x... where the string x-x-x... is a string of some number of numbers. The following letters are used: S - slot D - device P - port C - channel (i.e. link)
Resource Type	Resource Type (Integer)	0-4294967295	read-only	This determines what kind of resource is present. The entries are too numerous to list here; see the actual MIB file for the resource type codes.
Resource State	Integer	0-4294967295	read-only	Gives the state of the object. This is a bitmap whose exact meaning depends on the resource type.
Resource Critical Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are critical alarms
Resource Major Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are major alarms.
Resource Minor Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are minor alarms.
Resource Info Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are informational alarms.
Resource Nominal Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are nominal alarms.
Resource Trap Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are used to generate traps.

Resource Alarm Table

The Resource Alarm Table provides read-only alarm statistics for each of the resources in the system to identify alarm conditions, and is indexed by **resourceAlarmKey**. Table C-2 describes each field from the **Resource Alarm Table**.

Table C-2. Resource Alarm Table

Field Name	SNMP Type	Size/Range	Access	Description
Resource Alarm Key	Integer	0-4294967295	read-only	Uniquely identifies a system resource. This number will be used throughout the system to identify a resource. The entries are too numerous to list here; see the actual MIB file for the resource codes.
Resource Alarm Link Address	Display String	4 digits (1-255)	read-only	This is an ASCII text version of the resource key.
Resource Alarm Type	Resource Type (Integer)	0-4294967295	read-only	This determines what kind of resource is in an alarm state.
Resource Alarm State	Integer	0-4294967295	read-only	Gives the state of the object. This is a bitmap whose exact meaning depends on the resource type.
Resource Alarm Critical Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are critical alarms
Resource Alarm Major Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are major alarms.
Resource Alarm Minor Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are minor alarms.
Resource Alarm Info Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are informational alarms.
Resource Alarm Nominal Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are nominal alarms.
Resource Alarm Trap Mask	Integer	0-4294967295	read-only	The mask that identifies which bits in the state are used to generate traps.

Slot Configuration Table

The **Slot Configuration Table** combines the console's Node Summary Menu with the Slot Configuration Menu - they both refer to devices using a unique slot number index. The purpose of this table is to report current slot configuration settings and slot status.

Table C-3 provides a brief description of each field and its data constraints. The table contains a configured device type and actual device type for each slot entry. Although these two fields will usually be the same, there are cases where you may need to configure a slot's type before physically placing the device in the chassis. In this case, the configured type and actual types will not match. This may also be useful in problem determination for remote sites. Currently, the entries in the **Slot Configuration Table** can be modified but not added or deleted.

Table C-3. Slot Configuration Table Object Descriptions

Field Name	SNMP Type	Size/Range	Access	Description
Slot Number	Integer	1 - 100	Read-only	System assigned slot number in the node. Slots 98, 99, and 100 are used for the SMCs and the N+1 Protection Switch.
Slot Config Device Type	Slot Device Type (Integer)	0-99	Read-write	User-defined slot type: Octal T1/E1 (1), Quad High Speed (2), Octal High Speed (3), Quad OCU (4), System Manager (5), Quad T1 (6), DS3 (7), Test Access (8), Octal Voice (9), Protection Switch (15), Router (16), STS1 (17), Hybrid DS3 (18).
Slot Actual Device Type	Slot Device Type (Integer)	0-99	Read-only	Physical slot type reported by card: (same as Slot Config Device Type).
Slot Device State	Integer	0-7	Read-only	Current device machine state: Not Present (0), Online (1), Offline (2), Disabled (3), Standby (4), Defective (5), Bus Error (6), or Out-of-Service (7)
Slot Alarm Level	Integer	0-99	Read-only	The current slot device alarm condition level that indicates it's severity: No Alarm (0), Minor-Level (1), Major-Level (2), Major-Minor (3), Critical-Level (4), Critical-Minor (5), Critical-Major (6), Critical-Major-Minor (7), Unknown (99)
Slot Device Name	Display String	0-11 chars.	Read-write	User-defined device name
Slot Device Version	Display String	0-12 chars.	Read-only	The current software version release identification number for this device.

Table C-3. Slot Configuration Table Object Descriptions (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
Slot Device Redundancy	Integer	0-2	Read-write	The configured N+1 Redundancy state of the device. The slot entries representing the System Manager Cards and the Protection Switch device cannot be used in a Set Request since N+1 Redundancy does not apply to them. Disable (0), Enable (1), or N/A (2)
Slot Misc. State	Integer	0-7	Read-only	The current slot/device miscellaneous state conditions: None (0), Errors (1), Test (2), Errors-test (3), ClockSrc (4), Errors-clockSrc (5), Test-clockSrc (6), Errors-test-clockSrc (7)
Slot Config Command Status	Integer	0-799	Read-write	Last Command Status or desired user command: Delete, Update, Switch, or Restore

Slot Configuration Commands

As stated in the DACS II AX Provisioning Guidelines above, any changes to the configurable slot values through the SET REQUEST must be dictated through the **SlotConfigCmdStatus** field. Currently, there are 4 actions or commands that can be performed on a selected entry from the Slot Configuration Table: *Update*, *Delete*, *Switch*, and *Restore*.

Update Slot Configuration

The **slotCmdStatus** value of *Update* is used to change the user defined slot name, configure the slot as part of an NDRG, or change the slot device type. The *Slot Update* command can be used to execute any one or all three of these parameter changes at once.

To change the slot name, the NMS can use any ASCII string that describes the slot device and send the new **slotDeviceName** value in a SET Request PDU along with the **slotConfigCmdStatus** variable with a value of *Update*. A GET Response PDU of identical form will be returned with the exception of the value of the **slotConfigCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined slot configuration error codes.

To change the configured device type, the NMS can choose one of the valid device type values as specified in the MIB and send the new slot **slotConfigDeviceType** value in a SET Request PDU along with the **slotConfigCmdStatus** variable with a value of *Update*. The device type should match the **slotActualDeviceType** value if the device is present or the value of the device type that will eventually be inserted in the slot. A GET Response PDU of identical form will be returned with the exception of the value of the **slotConfigCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined slot configuration error codes. Please note that a successful change to **slotConfigDeviceType** will result in the removal of the slot's current configuration settings and any configured circuit connections associated with that slot will be deleted. It is recommended that the NMS application designer, if at all possible, inform the user of such and verify the action before issuing the SET Request.

The **slotDeviceRedundancy** field indicates whether or not the device is part of a N+1 Device Redundancy Group (NDRG) and how it is configured for switchovers and restores. A **slotDeviceRedundancy** value of *Enable* for Slot #1, Slot #7, or Slot #11 (the designated Secondary devices) will indicate that this state applies to the entire Group. To change the Redundancy setting, the NSM can set the value of **slotDeviceRedundancy** to *Enable* or *Disable* and send the new value in a SET Request PDU along with the **slotConfigCmdStatus** variable with a value of *Update*. In order for the slot to be added to the NDRG successfully, the system must have the NDR capability enabled (refer to the value of **ndrEnabled** from the Redundancy Group) and the selected device must be configured as a Broadband

or Narrowband type. A GET Response PDU of identical form will be returned with the exception of the value of the **slotConfigCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined slot configuration error codes.

Delete Slot Configuration

To clear the configured device type, the NMS can send the **slotConfigCmdStatus** variable with a value of *Delete* in a SET Request PDU. No other variables should be included in the SET PDU. A GET Response PDU of identical form will be returned with the exception of the value of the **slotConfigCmdStatus** variable, which will contain the value *DeleteSuccessful* or one of the possible pre-defined slot configuration error codes. Please note that a successful deletion of the slot will result in the removal of the slot's current configuration settings and any configured circuit connections associated with that slot will be deleted. It is recommended that the NMS application designer, if at all possible, inform the user of such and verify the action before issuing the SET Request.

NDR Switchover

The NDR Switchover command is used to force a manual switchover to the Standby device. This command is only effective on devices configured as part of the NDRG (i.e. **slotDeviceRedundancy** field is set to *Enable*) except for the designated Secondary devices (Slot #1 for a Narrowband NDRG, Slot #11 for a Broadband Group 1 NDRG, and Slot #7 for a Broadband Group 2 NDRG). To force a switchover, the NMS can send the **slotConfigCmdStatus** variable with a value of *Switch* in a SET Request PDU. No other variables should be included in the SET PDU. A GET Response PDU of identical form will be returned with the exception of the value of the **slotConfigCmdStatus** variable, which will contain the value *SwitchSuccessful* or one of the possible pre-defined slot configuration error codes.

NDR Restore

The NDR Restore command is used to force a manual restore back to the original device that was switched out. This command is only effective on the currently protected member of NDRG (i.e. value of **ndrBroadbandGroup1Protected**, **ndrBroadband-Group2Protected**, or **ndrNarrowbandProtected** from the Redundancy Group). To force a restore, the NMS can send the **slotConfigCmdStatus** variable with a value of *Restore* in a SET Request PDU. No other variables should be included in the SET PDU. A GET Response PDU of identical form will be returned with the exception of the value of the **slotConfigCmdStatus** variable, which will contain the value *RestoreSuccessful* or one of the possible pre-defined slot configuration error codes.

System Profile Group

The System Profile Group essentially contains read-only information and is based on the About menu from the system console. Currently, the only configurable field is the **unitName**, which allows you to provide a unique name for the entire DACS II AX unit. Since this field is not inter-dependent on anything else, there is no Command Status field required to change the **unitName**. In the future, if additional read-write fields are added to the Group, a Command Status field may be added.

Table C-4. System Profile Group Object Description

Object Name	SNMP Type	Size/Range	Access	Description
Unit Name	Display String	1-30 chars	read-write	User-configured name for the system
Unit Type	Integer	1-3	read-only	Type of system: DACS 4 slot (1), DACS 11 slot (2), or DACS 11 slot redundant (3)
Active SMC	Integer	1-2	read-only	Current Online SMC: SMC-A (1) or SMC-B (2)
System Release	Display String	5 chars	read-only	Current SMC software version in the form 'xx.yy' where x is the software version number followed by the release number y.
Release Date	Display String	1-20 chars	read-only	The calendar release date of the current software version shown in System Release .
Flash Checksum	Display String	6 chars	read-only	The current flash memory checksum result displayed as: 0xFFFF
Xilinx Type	Display String	1-20 chars	read-only	The type of Xilinx chip used for the downloadable, programmable flash.
Xilinx Version	Display String	1-30 chars	read-only	The current version of the Xilinx chip used for the flash.
Rear Modem	Decision Type (Integer)	0-1	read-only	Indicates the presence (Yes) or non-presence (No) of the rear card modem. No (0) or Yes (1).
MIB Profile	Display String	1-256	read-only	Current SNMP Enterprise MIB Information for this release
System Manager Type	Integer	1-2	read-only	Type of System Manager Hardware: SMC-I (1) or SMC-II (2)

System Clock

The System Clock is divided into two groups, which allow for the configuration of the system date & time and also the system clock source settings. Currently, no traps are generated as a result of clock configuration changes.

System Date & Time

The System Date & Time Group allows the user to view/set any aspect of the system date/time. It is accessed through non-table leaf nodes, all of which have read-write permission. They can be modified individually or all at once, but the **sysTimeCmdStatus** with a value of *UpdateSysTime* must accompany any variable change. This allows the Agent to validate the entire Date/Time structure. Table C-5 describes each object from the **System Date & Time Group**.

Table C-5. System Date & Time Group Object Description

Object Name	SNMP Type	Size/Range	Access	Description
Month	Integer	1-12	read-write	Current system calendar month
Day	Integer	1-31	read-write	Current system calendar day in month
Year	Integer	1-9999	read-write	Current system calendar year
Hours	Integer	0-23	read-write	Current system military hour
Minutes	Integer	0-59	read-write	Current system minutes
Seconds	Integer	0-59	read-write	Current system seconds
Day Of Week	Integer	1-7	read-write	Current system calendar day in week.
System Time Command Status	Integer	0-499	read-write	Update System Time command or Last Command Status.

Update System Time

To change the System Date or Time, the NMS can include one or more variable values to update the Date, Time, or Weekday in a SET Request PDU along with the **sysTimeCmdStatus** variable with a value of *UpdateSysTime*. A GET Response PDU of identical form will be returned with the exception of the value of the **sysTimeCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined system time configuration error codes.

Currently, the Month, Day, and Year are checked for validity, including leap years; however, the Weekday value is not verified against the calendar year.

System Clock Source

The **System Clock Source Group** displays the current system clock source settings and allows you to configure up to three different sources as a reference for the system clock. Table C-6 describes each field from the **System Clock Source Group**.

Table C-6. System Clock Source Configuration Group Object Description

Object Name	SNMP Type	Size/Range	Access	Description
Clock Source Active	Integer	0-8	read-only	Current Clock Source in use: Freerun (0), Primary (2), Secondary (3), Tertiary (4) primary-protected (6), secondary-protected (7), tertiary-protected (8)
Primary Clock Source	Clock Source Address (IP Address)	4 digits(1-255)	read-write	0.(Slot).(Port).(Station ID) of the Primary Clock Source
Secondary Clock Source	Clock Source Address (IP Address)	4 digits(1-255)	read-write	0.(Slot).(Port).(Station ID) of the Secondary Clock Source
Tertiary Clock Source	Clock Source Address (IP Address)	4 digits(1-255)	read-write	0.(Slot).(Port).(Station ID) of the Tertiary Clock Source
Clock Source Mode	Integer	0-4	read-write	Clock Fallback Mode: Freerun (0), Auto (1), Primary (2), Secondary (3), Tertiary (4)
Clock Source Command Status	Integer	0-499	read-write	Last Command Status or desired user command: (update-clock-src or update-clock-fallback).

Update System Clock Source

The Primary, Secondary and Tertiary Sources are represented in a special IP address format to represent the required slot, port, or station clock information.

- 1st octet = 0 (Reserved for future multi-chassis systems)
- 2nd octet = Slot (1-11) or zero (0) when Station Clock used
- 3rd octet = Port (1-32) or zero (0) when Station Clock used
- 4th octet = Station Clock ID (1-2) or zero when Slot/Port used

To change the System Clock configuration for the Primary, Secondary, or Tertiary Sources, the NMS can include a new variable value identifying the slot/port/station for one or more of these sources in a SET Request PDU along with the *clockSrcCmdStatus* variable with a value of *UpdateClockSrc*. A GET Response PDU of identical form will be returned with the exception of the value of the *clockSrcCmdStatus* variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined clock source configuration error codes.

Update Clock Source Mode

To change the System Clock Fallback configuration, the NMS can send the new mode value for the **clockSrcMode** variable in a SET Request PDU along with the **clockSrcCmdStatus** variable with a value of *UpdateClockFallback*.

A GET Response PDU of identical form will be returned with the exception of the value of the **clockSrcCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined clock source configuration error codes.

If the **clockSrcMode** is set to *Primary*, *Secondary*, *Tertiary*, or *Freerun*, then only that clock source will be used.

If the **clockSrcMode** is set to *Auto*, then the SMC will choose the highest priority clock source that is currently available, starting with the Primary.

If any configured clock source fails and no other is available, the system defaults to *Holdover* timing, which utilizes a history of external clock accuracy with respect to the internal Stratum 3 reference clock to calculate the average frequency of the external clock. *Holdover* 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; *Free run* is an internal Stratum 3 clock source that is always available.



NOTE:

If system resets or SMC switchover occurs, the 24 hour history necessary for Holdover timing is not retained. The 24-hour counter and history file are also reset, and Holdover timing is not available for another 24 hours. Free run timing will be used in this case.

Connections

The Connections branch contains a series of tables and groups that provide all the necessary data for circuit connection provisioning. The initial Connection Info branch contains two non-table leaf objects.

The ***activeMapID*** variable provides a quick way for the NMS to identify which of the configured Connection Maps are currently active. This information can also be obtained by querying the **Connection Map Table**, which reports the current status of each Map.

The other object is the ***connDBChecksum***, which applies to all connections in all maps. The number is calculated by taking the sum of the MapVersion values from each entry in the **Connection Map Table**. This value can then be used to identify possible discrepancies between the Agent and the NMS connection data.

Connection Map Definition Table

The **Connection Map Definition Table** contains information about each of the 5 Connection Maps, including active status. It is indexed by a unique **connMapID** number. The Connection Maps provide you with the capability to configure up to 5 different sets of circuit connection configurations and choose which set is actively operational. Currently, the entries in this table cannot be added or deleted, only modified.

Table C-7 describes each field from the Connection Map Definition Table. Each map entry will have a Version number and Date that are updated each time the map is saved.

Table C-7. Connection Map Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
Connection Map ID	Integer	1-5	read-only	System-assigned Map number.
Connection Map Name	Display String	1-11 chars	read-write	User-defined name of a specific connection configuration map.
Connection Map Current Status	Integer	1-3	read-write	Current status of the Connection Map: Active (1), Non-Active(2), Non-Active-tagged (3).
Connection Map Description	Display String	1-20 chars	read-write	User-defined description of the connection configuration map.
Connection Map Counts	Counter	1-1024	read-only	Number of system connections configured and saved for this map.
Connection Map Version	Counter	1-256	read-only	Current version number for this map - counter updated after each map change.
Connection Modified Date	Date String	N/A	read-only	Date of last map change.
Connection Map Command Status	Integer	0 - 499	read-write	Last Command Status or desired user command: (activate, update, save, or copy).

Connection Map Commands

As stated in the General Provisioning Guidelines above, any changes to the configurable Connection Map values through the SET REQUEST must be dictated through the **connMapCmdStatus** field. Currently, there are 4 actions or commands that can be performed on a selected entry from the Connection Map table: *Activate*, *Update*, *Save*, and *Copy*.

A single SNMP SET Request message from the Manager can refer to several rows/records from the Active Connection Table, however, the fields for each record should be grouped together and each record must be terminated by the **connMapCmdStatus** field to denote the end of the "action". This allows the Agent to know when the record is complete so it can be applied to the Database. The Agent will return the identical OIDs and values provided in the SET with the exception of the **connMapCmdStatus**. This field will be changed to reflect the action taken (either a success code or appropriate error code).

Activating a Connection Map

To choose a different active Map, the NMS can select a non-active entry and send the **connMapCurrStatus** value of *Active* in a SET Request PDU along with the **connMapCmdStatus** variable with a value of *Activate*. A GET Response PDU of identical form will be returned with the exception of the value of the **connMapCmdStatus** variable, which will contain the value *ActivateSuccessful* or one of the possible pre-defined map configuration error codes. Changing a NonActive or Tagged Map to Active will also automatically change the current Active Map entry to NonActive. A Tagged map will lose its tag when becoming Active. It is recommended that the NMS application designer, if at all possible, verify this action with the user before issuing the SET Request.

Updating a Connection Map

To change a Connection Map name, description, or status, the NMS can send the new values for one or more of the configurable map fields for a selected entry in a SET Request PDU along with the **connMapCmdStatus** variable with a value of *Update*. A GET Response PDU of identical form will be returned with the exception of the value of the **connMapCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined map configuration error codes.

A **connMapCurrStatus** value of *Tagged* is used to set-up a non-active map as a destination to be copied to with another map's connection configuration. *Tagged* and *NonActive* are the only valid value for the **connMapCurrStatus** to be used with the Update command. The *Active* value is only used in conjunction with the Activate command. Also, an Active map cannot be Tagged, only a NonActive map can be changed to Tagged. A Tagged map can be changed back to NonActive with the *Update* command or changed to *Active* with the *Activate* command.

Saving a Connection Map

To save a Connection Map, the NMS can select any map entry and send the **connMapCmdStatus** value of *Save* in a SET Request PDU. A GET Response PDU of identical form will be returned with the exception of the value of the **connMapCmdStatus** variable, which will contain the value *SaveSuccessful* or one of the possible pre-defined map configuration error codes. Note that saving the map will update the **connMapCounts**, **connMapVersion**, and **connMapDate** fields for the selected map entry, and consequently the **connDBCChecksum** variable, is updated as well.

Copying a Connection Map

To copy a map configuration to another non-active map, the NMS can select any map entry and send the **connMapCmdStatus** value of *Copy* in a SET Request PDU. No other values should be included in the SET PDU. A GET Response PDU of identical form will be returned with the exception of the value of the **connMapCmdStatus** variable, which will contain the value *CopySuccessful* or one of the possible pre-defined map configuration error codes.

Successful execution of the Copy command will result in the selected map's Configuration to be copied to all maps who are currently Tagged. The **connMapCurrStatus** value of *Tagged* will be changed back to NonActive for all maps and a Connection Map Manager Trap indicating *CopySuccessful* will be sent for each destination map.

Deleting a Connection Map

To delete a Connection Map, the NMS sends the **connMapCmdStatus** value of *Delete* in a SET Request PDU. No other values should be included in the SET PDU. A GET Response PDU of identical form will be returned with the exception of the value of the **connMapCmdStatus** variable, which will contain the value *DeleteSuccessful* or one of the possible pre-defined map configuration error codes. Successful execution of the *Delete* command will result in the selected map being deleted.

Connection Configuration Tables

The Connection circuit data is represented in two Tables, the **System Connection Table** and the **Active Connection Table**, and also through set of non-table objects called **Add Connection Group**. Together, they provide the capability to add, update, and delete system circuit connections for any active or non-active map. Table C-8 provides a brief description of each field and their data constraints, which applies to both Connection Tables and the **Add Connection Group**. The **SrcAddr** and **DestAddr** fields use an IP address format to represent the required slot/port/timeslot data.

- 1st octet = 0 (Reserved for future multi-chassis systems)
- 2nd octet = Slot (1-11)
- 3rd octet = Port (1-32)
- 4th octet = Starting Timeslot (0-31)

These fields were merged to cut back on the number of fields (OIDs) required to be transmitted between the NMS and the Agent. The **SrcTsBitmap** and **DestTsBitmap** fields can be optionally used to specify the exact allocation of

timeslots to be reserved on the ports for the selected circuit connection. Note that timeslot zero (0) is represented by the right-most bit. If the bitmaps are not included in the SET Request PDU, the SMC will automatically allocate the next set of available timeslots on the specified ports. The **BroadcastSrcId** field is the Connection ID of a currently configured connection and this field is only required when creating a new Listener connection.

Table C-8. Connection Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
Map ID	Integer	0-5	read-only (read-write for Add)	Configuration Map Number: Active (0), or Map # 1, 2, 3, 4, or 5.
Connection ID	Integer	1-1024	read-only	System assigned Connection number
Connection Name	Display String	1-20 chars	read-write	User defined Connection name.
Connection Type	Connection Type (Integer)	0-4	read-only (read-write for Add)	Type of Connection: Full Duplex (0), Broadcast (1), Broadcast Master (2), Listen-Source (3), or Listen-Destination (4).
Source Address	Time Slot Address (IP Address)	4 digits(1-255)	read-only (read-write for Add)	0.(Slot).(Port).(Starting Timeslot) of the Source Port.
Destination Address	Time Slot Address (IP Address)	4 digits(1-255)	read-only (read-write for Add)	0.(Slot).(Port).(Starting Timeslot) of the Destination Port.
Comm	Communications Type (Integer)	0-2	read-write	Communications Medium: Data (0), Voice (1), or Voice Au-To-Mu (2).
Speed	Connection Speed (Integer)	0-66	read-write	Connection Speed (67 different choices), determines number of Timeslots (DS0) needed, or Clear Mode.
Source Timeslot Bitmap	Integer	0-4294967295	read-write	32 bit field used to designate the desired Source Port Timeslots.
Destination Timeslot Bitmap	Integer	0-4294967295	read-write	32 bit field used to designate the desired Destination Port Timeslots
Broadcast Source ID	Integer	1-1024	read-only (read-write for Add)	Broadcast Connection number used by a Listener Connection.
Test Mode	Test Access (Integer)	0-6	read-only	Type of test access method if the current connection is in test mode. None (0), Monitor Source (1), Monitor Destination (2), Monitor Both (3), Split Source (4), Split Destination (5), or Split Both (6).
Connection Command Status	Connection Command Status (Integer)	0-99	read-write	Last Command Status or desired user command: (create, update, or delete).

Add Connection Group

The Add Connection Group contains a blank set of connection fields for the purpose of creating a new connection record. Basically this is a write-only set of objects that, when read, will return default or zero values for each field. When used with the SNMP SET Request, an attempt is made by the SMC to create a new connection entry for the specified **MapID**. Upon success, connection entries are actually added to either the **Active Connection Table** or the **System Connection Table**.

Although not used for creating a connection, the **TestMode** field is included in this Group so that the new connection record exactly matches an entry from one of the Connection Tables.

System Connection Table

The **System Connection Table** contains all the configured connections from each of the five Connection Maps and is indexed by both the **sysMapID** and the **sysConnID**. This table is generally used to view all the configured connections in the system or to update or remove a connection from one of the non-active maps.

Active Connection Table

The **Active Connection Table** contains only the configured connections from the Active Map and is indexed by both the **actvMapID** and the **actvConnID**. Since the map is the same for each entry, the actual index is only the **actvConnID** but the **actvMapID** is included here so that the entries match the appropriate entries from the System Connection Table. This table is generally used to view all the Active connections or to update or remove a connection from the Active Map.

Connection Configuration Commands

As stated in the General Provisioning Guidelines above, any changes to the configurable connection record values through the SET REQUEST must be dictated through the **ConnCmdStatus** field.

Currently, there are four actions or commands that can be performed on a selected entry from the **System Connection Table** or the **Active Connection Table**: *Update*, *ChangeNSave*, *Delete*, or *DeleteNSave*. The *Add* and *AddNSave* commands can only be performed on a set of objects from the Add Connection Group. Please note, the successful completion of any of the regular *Update*, *Delete*, or *Add* commands will only update the configured connections in system memory. To make these changes permanent (i.e., written to the file system), the NMS will need to issue a Save command for the affected Connection Map. This must be done before attempting to copy one Connection Map to another. When using the *ChangeNSave*, *DeleteNSave*, or *AddNSave* commands, the changes will be written to the file system immediately and no other actions are needed. These commands should not be used when making bulk changes to a configuration map.

Adding a Connection

New connections can be added with a SET Request PDU using the **Add Connection Group** variables.

For a regular Broadcast or Full-Duplex connection, at minimum, the following fields must be included in the SET: **addConnName**, **addConnType**, **addSrcAddr**, **addDestAddr**, **addComm**, and **addSpeed**, along with the **addCmdStatus** variable with a value of *Add*.

For a Broadcast Master connection, at minimum, the following fields must be included in the SET: **addConnName**, **addConnType** with a value of *BcMast*, **addSrcAddr**, **addComm**, and **addSpeed**, along with the **addCmdStatus** variable with a value of *Add*.

For a Listener connection, at minimum, the following fields must be included in the SET: **addConnName**, **addConnType** with a value of *Listener*, **addDestAddr**, **addBroadcastSrcId**, along with the **addCmdStatus** variable with a value of *Add*.

By default, the connection ID is added by the system. If no connection ID is provided or a connection ID value of zero is provided in the SET request, the system will use the next available connection ID. If the connection ID is provided in the SET, the system will use this ID unless it is already in use, in which case an error will be returned.

By default, the Add table will add entries to the Active Map unless the **addMapID** value is provided referencing a specific Connection Map. The **addSrcTsBitmap**, **addDestTsBitmap** fields can be optionally included to specify the exact allocation

Updating a Connection

of timeslots to use on the associated port. A GET Response PDU of identical form will be returned with the exception of **addCmdStatus** variable, which will contain the value *Add-Successful* or one of the possible pre-defined connection configuration error codes. Please note, the new connection entry is not permanently saved until the *Save* command is executed on the map entry or unless the *AddNSave* is used in place of the *Add* command.

The **ConnCmdStatus** value of *Update* is used to change the user defined connection name, update the communications type, change the connection speed, or reassign the allocated timeslots on the Source or Destination Ports. The Connection *Update* command can be used to execute any one or all of these parameter changes at once for either the **System Connection Table** or the **Active Connection Table**.

To change the connection name, the NMS can use any ASCII string that describes the connection circuit and send the new **ConnName** value in a SET Request PDU along with the **ConnCmdStatus** variable with a value of *Update*. A GET Response PDU of identical form will be returned with the exception of the value of the **ConnCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined connection configuration error codes.

Please note, the modified connection entry is not permanently saved until the *Save* command is executed on the map entry or the *ChangeNSave* is used in place of the *Update* command.

To change the configured speed or communications type, the NMS can choose one of the valid values as specified in the MIB and send the new **Speed** and or **Comm** value in a SET Request PDU along with the **ConnCmdStatus** variable with a value of *Update*. The speed will determine the number timeslots needed. A GET Response PDU of identical form will be returned with the exception of the value of the **ConnCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined connection configuration error codes. Please note, the modified connection entry is not permanently saved until the *Save* command is executed on the map entry.

To change the connection timeslot allocation, the NMS can obtain, from the user, a valid 32-bit value with bits set for each timeslot and send the new **SrcTsBitmap** and or **DestTsBitmap** values in a SET Request PDU along with the **ConnCmdStatus** variable with a value of *Update*. The speed will determine the number of timeslots needed. A GET Response PDU of identical form will be returned with the exception of the value of the **ConnCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined connection configuration error codes. Please note, the modified connection entry is not permanently saved until the *Save* command is executed on the map entry.

Deleting a Connection

To remove a configured connection, the NMS can send the **ConnCmdStatus** variable with a value of *Delete* in a SET Request PDU. The DACS II AX Agent ignores any other fields included in the same PDU.

A GET Response PDU of identical form will be returned with the exception of the value of the **ConnCmdStatus** variable, which will contain the value *DeleteSuccessful* or one of the possible pre-defined slot configuration error codes. Please note, the deleted connection entry is not permanently removed until the *Save* command is executed on the map entry or unless the *DeleteNSave* is used in place of the *Delete* command. It is recommended that the NMS application designer, if at all possible, verify either action with the user before issuing the SET Request.

N+1 Redundancy

The Redundancy branch contains information about the system's N+1 Redundancy settings. The **ndrBroadbandGroup1**, **ndrBroadbandGroup2** and **ndrNarrowbandGroup** values are sent as a normal SNMP Integer type but only two bytes are utilized. When interpreting the bit field, the NMS should note that slot 1 is represented by the right-most bit. The **ndrBroadbandGroup1Protected**, **ndrBroadbandGroup2Protected**, and **ndrNarrowbandProtected** values represent the slot number of the device that is currently been switched out of their respective N+1 Device Redundancy Group (NDRG). A zero value for any **Protected** field indicates that all primary devices for that NDRG remain operational. Table C-9 provides **NDR Group Object Descriptions**.

Table C-9. NDR Group Object Description

Object Name	SNMP Type	Size/Range	Access	Description
NDR Enabled	Decision Type (Integer)	0-1	read-write	System's capability of supporting the N+1 Device Redundancy functionality: No (0) or Yes (1). The user should configure this variable based on the existence of the N+1 Protection Switch.
NDR State	Integer	1-4	read-only	Current N+1 Device Redundancy state: Disabled (1), Frozen (2), Delayed (3), or Enabled (4).
NDR Auto Switch-over	Integer	0-3	read-only	Automatic Device Switchover mode when a primary card fails: Manual (0), Automatic (1), Narrowband-Auto (2), Broadband-1-Auto (3), Broadband-2-Auto (4).
NDR Auto Restore	Integer	0-3	read-only	Automatic Device Restore mode when a primary card becomes operational: Manual (0), Automatic (1), Narrowband-Auto (2), Broadband-1-Auto (3), Broadband-2-Auto (4).

Table C-9. NDR Group Object Description (Continued)

Object Name	SNMP Type	Size/Range	Access	Description
NDR Broadband Group 1	Integer	0-65535	read-only	2 byte bit field reflecting the slots that are part of the current active NDR Broadband Group 1. The first 11 bits represent each of the slot numbers. If any of the bits are set, those slots are currently part of the Group 1 N+1 Redundancy Group.
NDR Narrowband Group	Integer	0-65535	read-only	2 byte bit field reflecting the slots that are part of the current active NDR Narrowband Group. The first 11 bits represent each of the slot numbers. If any of the bits are set, those slots are currently part of the Narrowband N+1 Redundancy Group.
NDR Broadband Group 1 Protected	Integer	0-10	read-only	Slot number that indicates which device card from the active NDR Broadband Group 1 has been currently switched over. If a zero value is returned, no device card is currently protected.
NDR Narrowband Protected	Integer	0-11	read-only	Slot number that indicates which device card from the active NDR Narrowband Group has been currently switched over. If a zero value is returned, no device card is currently protected.
NDR Broadband Group 1 Type	Integer	8-21	read-write	Indicates which type of device is currently occupying the status of active NDR Broadband Group 1. Only one type of broadband device can be supported by N+1 Redundancy at one time. Whichever type is selected as the active Broadband Group 1 type should match the device type of the card in Slot 11, which is the designated Broadband Group 1 NDR Redundant slot. DS3 (8), STS1 (18), or Hybrid DS3 (21).
NDR Narrowband Type	Integer	13-22	read-only	Indicates which type of device is currently occupying the status of active NDR Narrowband Group. Only one type of Narrowband device can be supported by N+1 Redundancy at one time. Whichever type is selected as the active Narrowband type should match the device type of the card in Slot 1, which is the designated Narrowband NDR Redundant slot. Octal T1/E1 (13) or GR303 (22).

Table C-9. NDR Group Object Description (Continued)

Object Name	SNMP Type	Size/Range	Access	Description
NDR Dual Broadband Enabled	Decision Type (Integer)	0-1	read-write	Indicates the system's capability of supporting the N+1 Device Redundancy Dual Broadband Group functionality. No (0) or Yes (1). The user should configure this variable based on the existence of the Upgraded Protection Switch Hardware.
NDR Broadband Group 2	Integer	0-65535	read-only	2 byte bit field reflecting the slots that are part of the current active NDR Broadband Group 2. The first 11 bits represent each of the slot numbers. If any of the bits are set, those slots are currently part of the Group 2 N+1 Redundancy Group.
NDR Broadband Group 2 Protected	Integer	0-6	read-only	Slot number that indicates which device card from the active NDR Broadband Group 2 has been currently switched over. If a zero value is returned, no device card is currently protected.
NDR Broadband Group 2 Type	Integer	8-21	read-only	Indicates which type of device is currently occupying the status of active NDR Broadband Group 2. Only one type of broadband device can be supported by N+1 Redundancy at one time. Whichever type is selected as the active Broadband Group 2 type should match the device type of the card in Slot 7, which is the designated Broadband Group 2 NDR Redundant slot. DS3 (8), STS1 (18), or Hybrid DS3 (21).
NDR PSX CHassis Type	Integer	0-1	read-write	Indicates which type of Protection Switch Chassis Hardware has been detected. PSX 5200 (0) or PSX 5300 (1). In order to run with Dual Broadband Group configuration, this should be set to PSX 5300 (1).

Device Download Table The *Device Download Table* is used to upgrade system and device software via SNMP. The objects contained in this table can be used to trigger/cancel TFTP downloads. Table C-10 provides a brief description of each field and its data constraints.

Table C-10. Device Download Table.

Field Name	SNMP Type	Size/Range	Access	Description
Program File Index	Integer	0-4294967295	read-only	The index of the program file available for download.
Program File Name	Display String	15 Chars	read-only	The name of the program file available for download
Program File Size	Integer	0-4294967295	read-only	The size in bytes of the program file available for download.
Program Load Status	Integer	1-3	read-only	The load status of the program file. Loading Program File (1), Ready For Program Load (2), or Software Download Not Ready (3)
Program Load Initiator	Integer	12 Chars	read-only	The name of the user who initiated the program file download.
Program Bytes Sent	Integer	0-4294967295	read-only	The number of bytes sent in the current program file download.
Program Slot Number	Integer	1-11	read-only	The slot number to which a program file is to be downloaded.
Program File Command	Integer	1-502	read-only	The command to change the load status of the program file, or an error/status returned from a command. Load Program File (1), Load Program To All (2), Cancel Download (3), or Delete Program File (4). See the actual MIB file for the remaining error/status codes.

Downloading Device Software The *programFileCommand* value of *loadProgramFile* is used to load a program to a single device, while a value of *loadProgramToAll* loads the program to all devices.

Devices Branch

For Release 10, there were no major changes to the Devices Branch. Figure C-3 shows a detailed view of the Devices Branch.

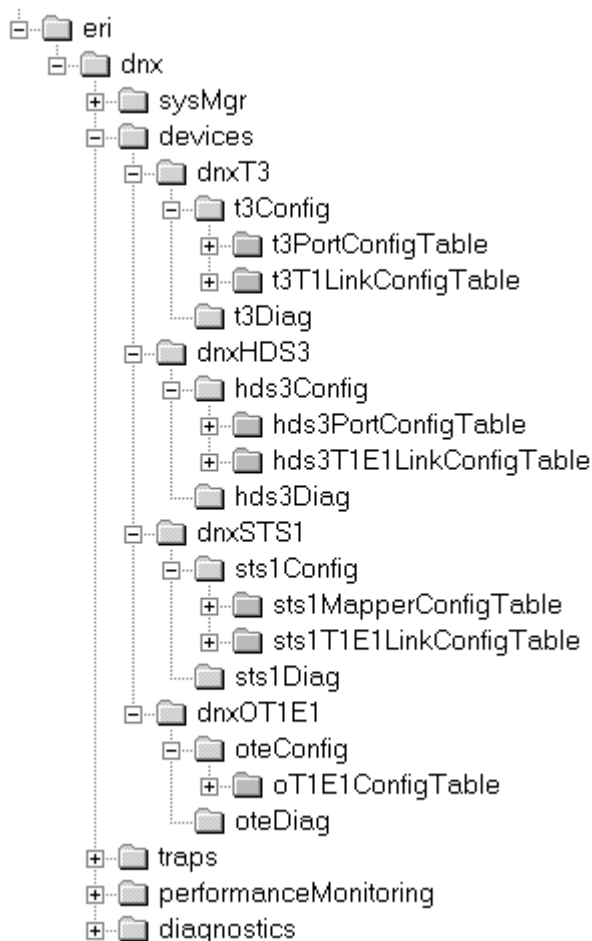


Figure C-3. Devices Branch - Detailed View

Octal T1/E1 Device Branch

The Octal T1/E1 branch falls under the Devices branch and it contains two sub-branches: **Config** and **Diag**. Currently only the Configuration branch is implemented with the **Octal T1/E1 Config Table**. Eventually, this section will allow you to perform diagnostics, access utilities, and view statistics through other tables.

Octal T1/E1 Configuration Table

The **Octal T1/E1 Config Table** provides you with the capability to configure certain attributes of the Card's eight ports. The Table is indexed by **oT1E1LinkAddr**, which is a combination slot number and port number (channel/timeslot number does not apply to T1/E1 links). Table C-11 describes each field from the **Octal T1/E1 Config Table**. Currently link entries cannot be added or deleted, only modified.

Table C-11. Octal T1/E1 Configuration Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
OT1E1 Config Link Address	Link Port Address (IP Address)	4 digits(1-255)	read-only	0.(Slot).(Port).(Channel) identifiers for the link.
OT1E1 Config Resource	Integer	0-4294967295	read-only	Unique number used to identify a system resource. (Index of the Resource Tables)
OT1E1 Config Link Name	Display String	0-20 chars	read-write	A user-defined name up to 14 characters in length used to identify the link.
OT1E1 Status	Port Status (Integer)	0-1	read-write	Current status of the port. The status will be either Out-of-Service (0) or In-Service (1).
OT1E1 Clear T1/E1	Integer	0-2	read-write	Determines the port support for T1 or E1 unframed. Disabled (0), Framed (1), or Unframed (2).
OT1E1 Line Type	Integer	0-11	read-write	Determines the type of framing used on the line: E1 (0), E1 CRC (1), E1 CAS (2), E1 CAS CRC (3), E1 Unframed (4), T1 ESF B8ZS (5), T1 ESF AMI 62411 (6), T1 D4 B8ZS (7), T1-D4 AMI 62411 (8), T1-B8ZS Unframed (10), T1 AMI Unframed (11), T1 D4 AMI Clear (12), or T1 ESF AMI Clear (13). When the value of OT1E1Clear is set to Unframed (2), the only valid options are: E1 Unframed (5), T1 B8ZS Unframed (10), or T1 AMI Unframed (11).

Table C-11. Octal T1/E1 Configuration Table Column Description (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
OT1E1 Network Loop	Function Switch (Integer)	0-1	read-write	Determines the module's ability to respond to loop diagnostic commands received from the network supplier. Disable (0) or Enable (1). Select "Enable" unless the commands are to be passed to another T1/E1 device.
OT1E1 Yellow Alarm	Decision Type (Integer)	0-1	read-write	Causes the module to discard data and send a yellow alarm if it is in a red alarm condition after a 3-second period. No (0) or Yes (1).
OT1E1 Recover Time	Integer	3-15	read-write	Time-out value for stopping Yellow alarm when coming out of Red alarm: 3, 10, or 15 seconds.
OT1E1 Idle Code	Integer	0-1	read-write	This selection determines whether the data transmitted over unused DS0s will be Busy (0) or Idle (1).
OT1E1 ESF Format	Integer	0-2	read-write	Describes the types of ESF network commands that the T1 module will respond to: None (0), AT&T 54016 (1) or ANSI T1.403 (2).
OT1E1 Config LBO	Integer	1-11	read-write	Type of Line Build Out: E1 shortHaul 0-6db (1), E1 longHaul 0-34db (2), T1 longHaul 0-0db (3), T1 longHaul 7-5db (4), T1 longHaul 15-0db (5), T1 longHaul 22-5db (6), T1 shortHaul 0-133ft (7), T1 shortHaul 133-266ft (8), T1 shortHaul 266-399ft (9), T1 shortHaul-399-533ft (10), T1 shortHaul 533-655ft (11).
OT1E1 Command Status	Link Command Status (Integer)	0-699	read-write	Last Command Status or user Update command.

Updating an Octal T1/E1 Link

The **oT1E1CmdStatus** value of *Update* is used to change the user defined Link name or configure the any other aspect of the Octal T1/E1 port. The *T1E1 Link Update* command can be used to change any single or combination of parameters at one time.

To change the Octal T1/E1 port parameters, the NMS can provide the list of valid values as specified in the MIB and send the new data in a SET Request PDU along with the **oT1E1CmdStatus** variable with a value of *Update*. Values for **oT1E1ClearT1E1**, **oT1E1LineType**, **oT1E1LBO**, and **oT1E1ESF** should match up with the type of link, either T1 or E1, as certain values only pertain to one or the other. A GET Response PDU of identical form will be returned with the exception of the value of the **oT1E1CfgCmdStatus** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined T1/E1 link configuration error codes.

**Copying an Octal
T1/E1 Link**

The *copyToAll* value in the *oT1E1CfgCmdStatus* can be used in a SET command to copy T1 link configuration to all other links within the Octal T1/E1 device.

T3 Device Branch

The T3 branch falls under the Devices branch and it contains two sub-branches: **Config** and **Diag**. Currently only the Configuration branch is implemented with the **T3 Config Table**.

T3 Configuration Table

The **T3 Config Table** provides you with the capability to configure certain attributes of the T3 port. The Table is indexed by **T3CfgAddr**, which is the T3 port number (channel number does not apply to T3 links). Table C-12 describes each field from the **T3 Config Table**. Currently link entries cannot be added or deleted, only modified.

Table C-12. T3 Port Configuration Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
T3 Config Address	Link Port Address (IP Address)	4 digits (1-255)	read-only	Uniquely identifies a DS3 slot/port.
T3 Config Resource	Integer	0-4294967295	read-only	Uniquely identifies a DS3 Port in the system.
T3 Config Circuit Name	Display String	0-20 chars	read-write	User-designated text name to identify the circuit.
T3 Facility ID	Display String	0-37 chars	read-write	Description of the facility where this equipment is located.
T3 Equipment ID	Display String	0-9 chars	read-write	Description of the equipment in use.
T3 Location	Display String	1-10 chars	read-write	Description of the location for this equipment.
T3 Frame ID	Display String	0-9 chars	read-write	Description of the building where this equipment is located.
T3 Unit Name	Display String	0-5 chars	read-write	Description of the bay or device where this equipment resides.
T3 Port Number	Display String	0-37 chars	read-write	User Description of the DS3 Port.
T3 Generator	Display String	0-37 chars	read-write	User Description of the number generated by this equipment.
T3 M13 Op Mode	Integer	0-1	read-write	Describes the framing selection for the DS1 to DS3 multiplexing: C-bit (0) or BellCore M13 (1).
T3 Receive Loop Timing	Function Switch (Integer)	0-1	read-write	Enables or disables the DS3 transmit timing provided by the receive clock. When disabled, timing is provided by an on-board oscillator. Disable (0) or Enable (1).

Table C-12. T3 Port Configuration Table Column Description (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
T3 Short Cable	Decision Type (Integer)	0-1	read-write	Indicates the line build out of the DS3 transmitter. Select "Yes" when attached to a cable less than 50 feet long. No (0) or Yes (1).
T3 M13 Remote Loop	Integer	0-9	read-write	Controls the line codes used to set and reset DS1 remote line loopback requests. This applies the BellCore M13 mode only. Third-cbit-inverted (0), second-cbit-inverted (1), first-cbit-inverted (2), third-cbit-stuffbit-inverted (4), second-cbit-stuffbit-inverted (5), first-cbit-stuffbit-inverted (6), stuffbit-inverted (7), stuffbit-is-zero (8), or stuffbit-is-one (9).
T3 Receive AIS	Integer	0-5	read-write	The Received bit pattern that will cause an error: Framed1010-Cbit0-noXbit (0), framed 1010-Cbit0-Xbit1 (1), framed 1010-noCbit-noXbit (2), framed 1111-noCbit-noXbit (3), unframed1010 (4), or unframed-allones (5).
T3 Transmit AIS	Integer	0-3	read-write	The Transmitted bit pattern that will cause an error: ANSI (0), framed-allones-Cbit1 (1), unframed1010 (2), or unframed-allones (3).
T3 Command Status	Link Command Status (Integer)	0-799	read-write	Determines the command action or response status for this link configuration row/record.

Updating a T3 Port The *t3CmdStatus* value of *Update* is used to change the user defined port name or configure the any other aspect of the T3 port. The *T3 Port Update* command can be used to change any single or combination of parameters at one time.

To change the T3 port parameters, the NMS can provide the list of valid values as specified in the MIB and send the new data in a SET Request PDU along with the *t3CmdStatus* variable with a value of *Update*. A GET Response PDU of identical form will be returned with the exception of the value of the *t3CmdStatus* variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined T3 port configuration error codes.

T3 T1 Configuration Table

The **T3 T1 Link Config Table** provides you with the capability to configure certain attributes of the card's 28 links. The table is indexed by *t3T1LinkAddr*, which is a combination slot number and port number (channel number does not apply to T1 links). Table C-13 describes each field from the **T3 T1 Link Config Table**. Currently link entries cannot be added or deleted, only modified.

Table C-13. T3 T1 Configuration Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
T3 T1 Config Link Address	Link Port Address (IP Address)	4 digits(1-255)	read-only	0.(Slot).(Port).(Channel) identifiers for the link.
T3 T1 Config Resource	Integer	0-4294967295	read-only	Uniquely identifies a T3/T1 link resource. Will be used throughout the system to identify a unique resource.
T3 T1 Config Link Name	Display String	0-20 chars	read-write	The user-defined text name used to identify the link.
T3 T1 Status	Port Status (Integer)	0-1	read-write	Status of the link. The status will either be Out-of-Service (0) or In-Service (1).
T3 T1 Framing	Integer	0-3	read-write	Determines the type of framing used on the link: D4 (0) or ESF (3).
T3 T1 Density	Integer	0-1	read-write	Determines the type of network signal used on the link: Clear (0) or 62411 (1). If line code is B8ZS, select "Clear". If line code is AMI, select "62411".
T3 T1 Network Loop	Function Switch (Integer)	0-1	read-write	Determines the module's ability to respond to loop diagnostic commands received from the network supplier. Disable (0) or Enable (1). Select "Enable" unless the commands are to be passed to another DS3 device.
T3 T1 Yellow Alarm	Decision Type (Integer)	0-1	read-write	Causes the module to discard data and send a yellow alarm if it is in a red alarm condition after a 3-second period. No (0) or Yes (1). "Yes" must be chosen if the network supplier is a common carrier, such as a telephone company.
T3 T1 Recover Time	Integer	3-15	read-write	Time-out value for stopping Yellow alarm when coming out of Red alarm: 3, 10, or 15 seconds.
T3 T1 ESF Format	Integer	0-1	read-write	Describes the types of ESF network commands that the T3 module will respond to. It has no meaning for D4 networks. AT&T 54016 (0) or ANSI T1.403 (1).
T3 T1 Idle Code	Integer	0-1	read-write	This selection determines whether the code that will be transmitted over the unused links will be Busy (0) or Idle (1).
T3 T1 Config Command Status	Link Command Status (Integer)	0-799	read-write	Determines the command action or response status for this link configuration row/record.

Updating a T1 Link

The ***t3T1CmdStatus*** value of *Update* is used to change the user defined Link name or configure the any other aspect of the T1 links. The *T1 Link Update* command can be used to change any single or combination of parameters at one time.

To change the T1 link parameters, the NMS can provide the list of valid values as specified in the MIB and send the new data in a SET Request PDU along with the ***t3T1CmdStatus*** variable with a value of *Update*. A GET Response PDU of identical form will be returned with the exception of the value of the ***t3T1CmdStatus*** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined T1 link configuration error codes.

Copying a T1 Link

The ***copyToAll*** value is sent as part of a SET command to copy T1 link configuration to all other links within the T3 device.

STS1 Device Branch

The STS1 branch falls under the Devices branch and it contains 2 sub-branches: **Config** and **Diag**. Currently only the Configuration branch is implemented with the **STS1 Config Table**. Eventually, this section will allow you to perform diagnostics, access utilities, and view statistics through other tables.

STS1 Mapper Configuration Table

The **STS1 Mapper Config Table** provides you with the capability to configure certain attributes of the card's STS1 Mapper. The Table is indexed by **sts1MapperAddr**. Table C-14 describes each field from the **STS1 Mapper Config Table**.

Table C-14. STS1 Mapper Configuration Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
STS1 Mapper Address	Link Port Address (IP Address)	4 digits(1-255)	read-only	Uniquely identifies an STS1 slot/port.
STS1 Mapper Resource	Integer	0-4294967295	read-only	Uniquely identifies an STS1 Device in the system.
STS1 VT Group 1	VT Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 1 through 4. Using the VT 2.0, link 4 is not used. E1 (0) or DS1 (1).
STS1 VT Group 2	VT Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 5 through 8. Using the VT 2.0, link 8 is not used. E1 (0) or DS1 (1).
STS1 VT Group 3	VT Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 9 through 12. Using the VT 2.0, link 12 is not used. E1 (0) or DS1 (1).
STS1 VT Group 4	VT Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 13 through 16. Using the VT 2.0, link 16 is not used. E1 (0) or DS1 (1).
STS1 VT Group 5	VT Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 17 through 20. Using the VT 2.0, link 20 is not used. E1 (0) or DS1 (1).
STS1 VT Group 6	VT Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 21 through 24. Using the VT 2.0, link 24 is not used. E1 (0) or DS1 (1).

Table C-14. STS1 Mapper Configuration Table Column Description (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
STS1 VT Group 7	VT Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 25 through 28. Using the VT 2.0, link 28 is not used. E1 (0) or DS1 (1).
STS1 VT Mapping	Integer	0-1	read-write	Indicates the Mapper Standard currently in use: Standard VT (0) or Sequential (1).
STS1 Timing	Integer	0-1	read-write	Indicates whether the STS1 device uses an internal or external clock: Internal (0) or External (1).
STS1 Short Cable	Function Switch (Integer)	0-1	read-write	Indicates the line build out of the STS1 transmitter: Disable (0) or Enable (1). Select "Enable" when attached to a cable less than 50 feet long.
STS1 Mapper Command Status	Link Command Status (Integer)	0-699	read-write	Determines the command status for this link configuration row/record.

Updating an STS1 Link

The ***sts1MaprCmdStatus*** value of *Update* is used to configure the STS1 Mapper. The *STS1 Mapper Update* command can be used to change any single or combination of parameters at one time.

To change the STS1 Mapper parameters, the NMS can provide the list of valid values as specified in the MIB and send the new data in a SET Request PDU along with the ***sts1MaprCmdStatus*** variable with a value of *Update*. Values for ***sts1VT Groups*** should match up with the type of links configured, either DS1 or E1, as their type only pertains to one or the other. A GET Response PDU of identical form will be returned with the exception of the value of the ***sts1MaprCmdStatus*** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined STS1 Mapper configuration error codes.

STS1 T1/E1 Link Configuration Table

The **STS1 T1E1 Link Config Table** provides you with the capability to configure certain attributes of the card's 28 links. The table is indexed by **sts1T1E1CfgLinkAddr**, which is a combination slot number and link/channel number. Table C-15 describes each field from the **STS1 T1E1 Link Config Table**. Currently link entries cannot be added or deleted, only modified.

Table C-15. STS1 T1/E1 Configuration Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
STS1 T1E1 Config Link Address	Link Port Address (IP Address)	4 digits(1-255)	read-only	Uniquely identifies an STS1 T1/E1 link resource: 0.(Slot).(Port).(Channel) identifiers for the link.
STS1 T1E1 Config Resource	Integer	0-4294967295	read-only	Uniquely identifies an STS1 T1/E1 channel in the system. This number is provided as a key to allow the manager to map the entry to a corresponding Resource Table entry.
STS1 T1E1 Config Link Name	Display String	0-20 chars	read-write	A user-defined name up to 20 characters in length used to identify the link.
STS1 T1E1 Status	Port Status (Integer)	0-1	read-write	Determines the current status of the link: Out-of- Service (0) or In-Service (1).
STS1 T1E1 Clear	Integer	0-2	read-write	Determines if the port supports T1 or E1 unframed. Disabled (0), Framed (1), or Unframed (2).
STS1 T1E1 Framing	Integer	1-7	read-write	Determines the type of framing used on the line: E1 (0), E1CRC (1), E1 CAS (2), E1 CAS CRC (3), E1 Unframed (4), T1 ESF (5), T1 D4 (6), or T1 Unframed (7). When the value of STS1 T1E1 Clear is set to Unframed (2), the only valid framing options are: E1 Unframed (4) or T1 Unframed (7).
STS1 T1E1 Network Loop	Function Switch (Integer)	0-1	read-write	Determines whether or not the module should respond to loop diagnostic commands received from the network supplier. Disable (0) or Enable (1). Select "Enable" unless the commands are to be passed to another STS1 device.
STS1 T1E1 Yellow Alarm	Decision Type (Integer)	0-1	read-write	Causes the module to discard data and send a yellow alarm if it is in a red alarm condition after a 3-second period. No (0) or Yes (1). "Yes" must be chosen if the network supplier is a common carrier, such as a telephone company.

Table C-15. STS1 T1/E1 Configuration Table Column Description (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
STS1 T1E1 Recover Time	Integer	3-15	read-write	Red Alarm time-out value. Determines the amount of seconds the port will wait to stop sending the yellow alarm when coming out of a red alarm condition: 3, 10, or 15 seconds.
STS1 T1E1 ESF Format	Integer	0-1	read-write	Describes the types of ESF network commands that the T1 link will respond to. It has no meaning for D4 networks. AT&T 54016 (0) or ANSI T1.403 (1).
STS1 T1E1 Idle Code	Integer	0-1	read-write	This selection determines whether the code that will be transmitted over the unused links will be Busy (0) or Idle (1).
STS1 T1E1 Config Command Status	Link Command Status (Integer)	0-699	read-write	The command status for this link configuration row/record.

Updating an STS1 T1/E1 Link

The ***sts1T1E1CfgCmdStatus*** value of *Update* is used to change the user-defined link name or configure the any other aspect of a T1/E1 link. The *T1E1 Link Update* command can be used to change any single or combination of parameters at one time.

To change the STS1 T1/E1 link parameters, the NMS can provide the list of valid values as specified in the MIB and send the new data in a SET Request PDU along with the ***sts1T1E1CfgCmdStatus*** variable with a value of *Update*. Values for ***sts1T1E1Framing*** and ***sts1T1E1ESF Format*** should match up with the type of link, either T1 or E1, as certain values only pertain to one or the other. A GET Response PDU of identical form will be returned with the exception of the value of the ***sts1T1E1CfgCmdStatus*** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined STS1 T1 link configuration error codes.

Copying an STS1 T1/E1 Link

The ***copyToAll*** value is sent as part of a SET command to copy T1 link configuration to all other links within the STS1 device.

HDS3 Device Branch

The HDS3 branch falls under the Devices branch and it contains two sub-branches: **Config** and **Diag**. Currently only the Configuration branch is implemented with the **HDS3 Config Table**. Eventually, this section will allow you to perform diagnostics, access utilities, and view statistics through other tables.

HDS3 Configuration Table

The **HDS3 Config Table** provides you with the capability to configure certain attributes of the card's HDS3 port. The Table is indexed by ***hds3PortCfgAddr***, which is the HDS3 port number (channel number does not apply to T1/E1 links). Table C-16 describes each field from the **HDS3 Config Table**. Currently link entries cannot be added or deleted, only modified.

Table C-16. HDS3 Port Configuration Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
HDS3 Port Config Address	Link Port Address (IP Address)	4 digits(1-255)	read-only	Uniquely identifies an HDS3 T1/E1 link resource.
HDS3 Port Config Resource	Integer	0-4294967295	read-only	Uniquely identifies an HDS3 Port in the system.
HDS3 Port Config Circuit Name	Display String	0-20 chars	read-write	A user-defined name up to 20 characters in length used to identify the circuit.
HDS3 Facility ID	Display String	0-37 chars	read-write	Description of the facility where this equipment is located.
HDS3 Equipment ID	Display String	0-9 chars	read-write	Description of the equipment in use.
HDS3 Location	Display String	1-10 chars	read-write	Description of the location for this equipment.
HDS3 Frame ID	Display String	0-9 chars	read-write	Description of the building where this equipment is located.
HDS3 Unit Name	Display String	0-5 chars	read-write	Description of the bay or device where this equipment resides.
HDS3 Port Number	Display String	0-37 chars	read-write	User Description of the HDS3 Port.
HDS3 Generator	Display String	0-37 chars	read-write	User Description of the number generated by this equipment.
HDS3 M13 Op Mode	Integer	0-1	read-write	Describes the framing selection for the DS1 to DS3 multiplexing: C-bit (0) or BellCore M13 (1).
HDS3 Receive Loop Timing	Function Switch (Integer)	0-1	read-write	Enables or disables the HDS3 transmit timing provided by the receive clock. When disabled, timing is provided by an on-board oscillator. Disable (0) or Enable (1).

Table C-16. HDS3 Port Configuration Table Column Description (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
HDS3 Short Cable	Decision Type (Integer)	0-1	read-write	Indicates the line build out of the HDS3 transmitter. No (0) or Yes (1). Select "Yes" when attached to a cable less than 50 feet long.
HDS3 M13 Remote Loop	Integer	0-2	read-write	Controls the line codes used to set and reset DS1 remote line loopback requests. This applies the BellCore M13 mode only. Third-cbit-inverted (0), second-cbit-inverted (1), or first-cbit-inverted (2).
HDS3 FEAC Loop-back Request	Function Switch (Integer)	0-1	read-write	Controls the line codes used to set and reset DS1 remote line loopback requests. This applies the BellCore M13 mode only. Disable (0) or Enable (1).
HDS3 Transmit AIS Local Loop	Integer	0-3	read-write	The Transmitted bit pattern used when the HDS3 port is in Local Loop. None (0), framed-1010-cbitZero (1), framed-allones-cbitZero (2), or unframed-allones (3).
HDS3 Receive AIS	Integer	1-5	read-write	The Received bit pattern to use to determine when the remote line is in error. Framed1010-noOverheadBits (1), cbitZero-noPayloadBits (2), framed1010-cbitZero (3), framed1111-noOverhead-Bits (4), or unframed-allones (5).
HDS3 Transmit AIS	Integer	0-3	read-write	The Transmitted bit pattern that is used when the HDS3 port is in error. None (0), framed-1010-cbitZero (1), framed-allones-cbitZero (2), or unframed-allones (3).
HDS3 DS2 Group 1	DS2 Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 1 through 4. Using the VT 2.0, link 4 is not used. E1 (0) or DS1 (1).
HDS3 DS2 Group 2	DS2 Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 5 through 8. Using the VT 2.0, link 8 is not used. E1 (0) or DS1 (1).
HDS3 DS2 Group 3	DS2 Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 9 through 12. Using the VT 2.0, link 12 is not used. E1 (0) or DS1 (1).

Table C-16. HDS3 Port Configuration Table Column Description (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
HDS3 DS2 Group 4	DS2 Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 13 through 16. Using the VT 2.0, link 16 is not used. E1 (0) or DS1 (1).
HDS3 DS2 Group 5	DS2 Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 17 through 20. Using the VT 2.0, link 20 is not used. E1 (0) or DS1 (1).
HDS3 DS2 Group 6	DS2 Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 21 through 24. Using the VT 2.0, link 24 is not used. E1 (0) or DS1 (1).
HDS3 DS2 Group 7	DS2 Group Type (Integer)	0-1	read-write	Indicates the type of grouping option used to on links 25 through 28. Using the VT 2.0, link 28 is not used. E1 (0) or DS1 (1).
HDS3 Command Status	Link Command Status (Integer)	0-699	read-write	Determines the command status for this link configuration row/record.

Updating an HDS3 Port

The *hds3CmdStatus* value of *Update* is used to change the user defined Link name or configure the any other aspect of the HDS3 port. The *T1E1 Link Update* command can be used to change any single or combination of parameters at one time.

To change the HDS3 port parameters, the NMS can provide the list of valid values as specified in the MIB and send the new data in a SET Request PDU along with the *hds3CmdStatus* variable with a value of *Update*. Values for *hds3M13 Op Mode*, *hds3M13 Remote Loop*, *hds3FEAC Loopback Request*, and *all hds3DS2 Groups* should match up with the type of link configured, either T1 or E1, as certain values only pertain to one or the other. A GET Response PDU of identical form will be returned with the exception of the value of the *hds3CmdStatus* variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined HDS3 port configuration error codes.

HDS3 T1/E1 Link Configuration Table

The **HDS3 T1E1 Link Config Table** provides you with the capability to configure certain attributes of the card's 28 links. The table is indexed by *hds3T1E1CfgLinkAddr*, which is a combination slot number and link/channel number. Table C-18 describes each field from the **HDS3 T1E1 Link Config Table**. Currently link entries cannot be added or deleted, only modified.

Table C-17. HDS3 T1/E1 Configuration Table Column Description

Field Name	SNMP Type	Size/Range	Access	Description
HDS3 T1E1 Config Link Address	Link Port Address (IP Address)	4 digits(1-255)	read-only	Uniquely identifies an HDS3 T1/E1 link resource.
HDS3 T1E1 Config Resource	Integer	0-4294967295	read-only	Uniquely identifies an HDS3 T1/E1 channel in the system. This number is provided as a key to allow the manager to map the entry to a corresponding Resource Table entry.
HDS3 T1E1 Config Link Name	Display String	0-20 chars	read-write	A user-defined name up to 20 characters in length used to identify the link.
HDS3 T1E1 Link Status	Port Status (Integer)	0-1	read-write	Determines the current status of the link: Out-of- Service (0) or In-Service (1).
HDS3 T1E1 Clear	Integer	0-2	read-write	Determines the port support for T1 or E1 unframed. Disabled (0), Framed (1), or Unframed (2).
HDS3 T1E1 Framing	Integer	0-7	read-write	Determines the type of framing used on the line: E1 (0), E1CRC (1), E1 CAS (2), E1 CAS CRC (3), E1 Unframed (4), T1 ESF (5), T1 D4 (6), or T1 Unframed (7). When the value of HDS3 T1E1 Clear is set to Unframed (2), the only valid framing options are: E1 Unframed (4) or T1 Unframed (7).
HDS3 T1E1 Network Loop	Function Switch (Integer)	0-1	read-write	Determines whether or not the module should respond to loop diagnostic commands received from the network supplier. Disable (0) or Enable (1). Select "Enable" unless the commands are to be passed to another HDS3 device.
HDS3 T1E1 Yellow Alarm	Decision Type (Integer)	0-1	read-write	Causes the module to discard data and send a yellow alarm if it is in a red alarm condition after a 3-second period. No (0) or Yes (1). "Yes" must be chosen if the network supplier is a common carrier, such as a telephone company.
HDS3 T1E1 Recover Time	Integer	3-15	read-write	Red Alarm time-out value. Determines the amount of seconds the port will wait to stop sending the yellow alarm when coming out of a red alarm condition: 3, 10, or 15 seconds.

Table C-17. HDS3 T1/E1 Configuration Table Column Description (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
HDS3 T1E1 ESF Format	Integer	0-1	read-write	Describes the types of ESF network commands that the T1 link will respond to. It has no meaning for D4 networks. AT&T 54016 (0) or ANSI T1.403 (1).
HDS3 T1E1 Idle Code	Integer	0-1	read-write	This selection determines whether the data that will be transmitted over the unused links will be Busy (0) or Idle (1).
HDS3 T1E1 Config Command Status	Link Command Status (Integer)	0-699	read-write	The command status for this link configuration row/record.

Updating an HDS3 T1/E1 Link

The ***hds3T1E1CfgCmdStatus*** value of *Update* is used to change the user-defined link name or configure the any other aspect of a T1/E1 link. The ***T1E1 Link Update*** command can be used to change any single or combination of parameters at one time.

To change the HDS3 T1/E1 link parameters, the NMS can provide the list of valid values as specified in the MIB and send the new data in a SET Request PDU along with the ***hds3T1E1CfgCmdStatus*** variable with a value of *Update*. Values for ***hds3T1E1Framing*** and ***hds3T1E1ESF Format*** should match up with the type of link, either T1 or E1, as certain values only pertain to one or the other. A GET Response PDU of identical form will be returned with the exception of the value of the ***hds3T1E1CfgCmdStatus*** variable, which will contain the value *UpdateSuccessful* or one of the possible pre-defined HDS3 T1/E1 link configuration error codes.

Copying an HDS3 T1/E1 Link

The ***copyToAll*** value is sent as part of a SET command to copy T1 link configuration to all other links within the HDS3 device.

Traps Branch

The Traps Branch was used in the past to record historical information from the last alarm trap. With the addition of separate alarm information, only the **trapSequence** parameter is used to keep track of the last trap sent to the agent; the others have been obsoleted but are kept for backward compatibility purposes. Figure C-4 shows a detailed view of the Traps Branch.

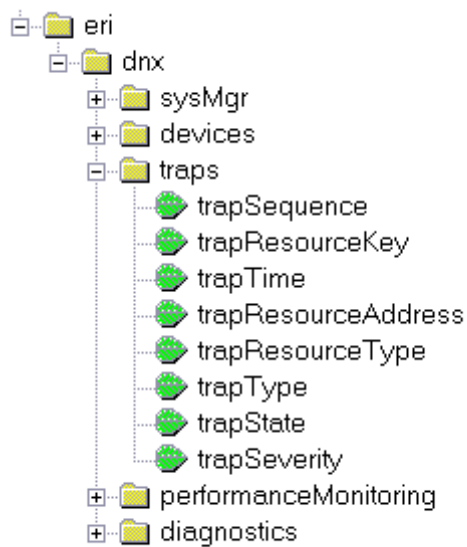


Figure C-4. Traps Branch - Detailed View

Performance Monitoring Branch

New for Release 10, the Performance Monitoring Branch is provided by ERI-DNX-PERF-MONT-MIB. Figure C-5 shows a detailed view of the Performance Monitoring Branch.

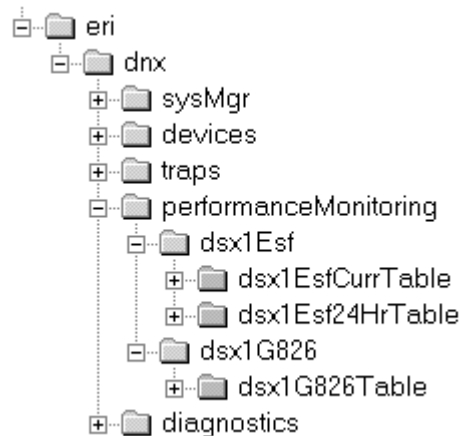


Figure C-5. Performance Monitoring Branch - Detailed View

Performance Monitoring Statistics are currently provided in three tables: ESF Current Statistics, ESF 24 Hour Statistics, and G.826 Statistics. Each table will provide data for all applicable DS1/E1 links in the system.

DS1/E1 ESF Current Statistics

The DS1/E1 ESF Current Statistics Table provides current ESF statistics of each DS1/E1 link in the system for the current 15-minute time interval, and is indexed by ***dsx1EsfCurrLinkAddr***. Table C-18 describes each field from the **DS1/E1 ESF Current Statistics Table**. A row in this table cannot be added, deleted, or modified.

Table C-18. DS1/E1 ESF Current Statistics Table

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 ESF Current Link Address	Link Port Address (IP Address)	4 digits (1-255)	read-only	This number uniquely identifies a DS1/E1 link resource. This number will be used throughout the system to identify a unique link. The format is represented using an IP address syntax (4 byte string). Note that the maximum valid link number will vary depending on the specified carrier and framing options. For example, an Octal T1/E1 device has 8 DS1 links however a DS3 device has 28 DS1 links.
DSX-1 ESF Current Resource ID	Integer	0-4294967295	read-only	Uniquely identifies a link in the system. This number is provided as key to allow the manager to map this entry to a corresponding Resource Table entry.
DSX-1 ESF Current Errored Seconds	Counter	0-900	read-only	The number of errored seconds that have occurred on the link during the current interval. Not incremented during an Unavailable Second.
DSX-1 ESF Current Unavailable Seconds	Counter	0-900	read-only	The number of failed seconds (UAS) that have occurred on the link during the current interval.
DSX-1 ESF Current Severely Errored Seconds	Counter	0-900	read-only	The number of severely errored seconds that have occurred on the link during the current interval. Controlled slips are not included in this parameter. Not incremented during an Unavailable Second.
DSX-1 ESF Current Bursty Errored Seconds	Counter	0-900	read-only	The number of bursty errored seconds that have occurred on the T1 link during the current interval. Not incremented during an Unavailable Second and applies to ESF signals only.
DSX-1 ESF Current Loss-of-Frame Count	Counter	0-4294967295	read-only	The number of loss of frame errors that have occurred on the link during the current interval.
DSX-1 ESF Current Time Remaining	Counter	0-900	read-only	The number of seconds remaining in the current interval.
DSX-1 ESF Current Intervals	Integer	1-96	read-only	The total number of 15 minute intervals counted during the current 24 hour period.

Table C-18. DS1/E1 ESF Current Statistics Table (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 ESF Current Status	Display String	0-8 chars	read-only	Defines the status of the DS1/E1 link using an 8-character code which can contain numbers or letters.

DS1/E1 ESF 24-Hour Statistics

The DS1/E1 ESF 24-Hour Statistics Table provides ESF statistics of each DS1/E1 link in the system over the last 24-hour period, and is indexed by ***dsx1Esf24HrLinkAddr***. Table C-19 describes each field from the **DS1/E1 ESF 24-Hour Statistics Table**. A row in this table cannot be added, deleted, or modified.

Table C-19. DS1/E1 ESF 24-hour Statistics Table

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 ESF 24-hour Link Address	Link Port Address (IP Address)	4 digits (1-255)	read-only	This number uniquely identifies a DS1/E1 link resource. This number will be used throughout the system to identify a unique link. The format is represented using an IP address syntax (4 byte string). Note that the maximum valid link number will vary depending on the specified carrier and framing options. For example, an Octal T1/E1 device has 8 DS1 links however a DS3 device has 28 DS1 links.
DSX-1 ESF 24-hour Resource ID	Integer	0-4294967295	read-only	Uniquely identifies a link in the system. This number is provided as key to allow the manager to map this entry to a corresponding Resource Table entry.
DSX-1 ESF 24-hour Errored Seconds	Counter	0-86399	read-only	The number of errored seconds that have occurred on the link during the past 24 hours.
DSX-1 ESF 24-hour Unavailable Seconds	Counter	0-86399	read-only	The number of failed seconds (UAS) that have occurred on the link during the past 24 hours.
DSX-1 ESF 24-hour Severely Errored Seconds	Counter	0-86399	read-only	The number of severely errored seconds that have occurred on the link during the past 24 hours.
DSX-1 ESF 24-hour Bursty Errored Seconds	Counter	0-86399	read-only	The number of bursty errored seconds that have occurred on the T1 link during the past 24 hours.
DSX-1 ESF 24-hour Loss-of-Frame Count	Counter	0-4294967295	read-only	The number of loss of frame errors that have occurred on the link during the past 24 hours.

DS1/E1 G.826 Statistics

The DS1/E1 G.826 Statistics Table provides G.826 statistics for each DS1/E1 link in the system since the link has been up or since the last time the counts were cleared. The counters are calculated in accordance with the ITU-T G.826 Error performance parameters, dated November 1993. This table is indexed by ***dsx1G826LinkAddr***. Table C-20 describes each field from the **DS1/E1 G.826 Statistics Table**. A row in this table cannot be added or deleted but the counter time period can be reset to zero.

Table C-20. DS1/E1 G.826 Statistics Table

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 G.826 Link Address	Link Port Address (IP Address)	4 digits (1-255)	read-only	This number uniquely identifies a DS1/E1 link resource. This number will be used throughout the system to identify a unique link. The format is represented using an IP address syntax (4 byte string). Note that the maximum valid link number will vary depending on the specified carrier and framing options. For example, an Octal T1/E1 device has 8 DS1 links however a DS3 device has 28 DS1 links.
DSX-1 G.826 Resource ID	Integer	0-4294967295	read-only	Uniquely identifies a link in the system. This number is provided as key to allow the manager to map this entry to a corresponding Resource Table entry.
DSX-1 G.826 Total Time	Counter	0-4294967295	read-write	The total number of seconds the G.826 data has been collected. Resetting this to zero will clear the counters for specific link.
DSX-1 G.826 Errored Seconds	Counter	0-4294967295	read-only	The total number of errored seconds that have occurred since the link has been up or since the G.826 counters have been reset.
DSX-1 G.826 Error-Free Seconds	Counter	0-4294967295	read-only	The total number of error-free seconds that have occurred since the link has been up or since the G.826 counters have been reset.
DSX-1 G.826 Severely Errored Seconds	Counter	0-4294967295	read-only	The total number of severely errored seconds that have occurred since the link has been up or since the G.826 counters have been reset.
DSX-1 G.826 Consecutive Severely Errored Seconds	Counter	0-4294967295	read-only	The total number of continuous occurrences of severely errored seconds, in one second intervals, since the link has been up or since the G.826 counters have been reset.

Table C-20. DS1/E1 G.826 Statistics Table (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 G.826 Consecutive Error-Free Seconds	Counter	0-4294967295	read-only	The total number of consecutive one-second intervals that did not have defects or errors since the link has been up or since the G.826 counters have been reset.
DSX-1 G.826 Errored Blocks	Counter	0-4294967295	read-only	The total number of background errored blocks that have occurred since the link has been up or since the G.826 counters have been reset.
DSX-1 G.826 Errored Seconds Ratio	Integer	0-4294967295	read-only	The ratio of errored seconds to total seconds in available time during a fixed measurement interval.
DSX-1 G.826 Severely Errored Seconds Ratio	Integer	0-4294967295	read-only	The ratio of severely errored seconds to total seconds in available time during a fixed measurement interval.
DSX-1 G.826 Background Errored Seconds Ratio	Integer	0-4294967295	read-only	The ratio of background block errors to total blocks in available time during a fixed measurement interval. This total block count excludes all blocks during severely errored seconds.

Diagnostics Branch

New for Release 10, the Diagnostics Branch is provided by ERI-DNX-LINK-TEST-MIB, and is used to provide vital statistics via the DS1/E1 Link Test Statistics Table (**dsx1TestTable**). Figure C-6 shows a detailed view of the Diagnostics Branch.

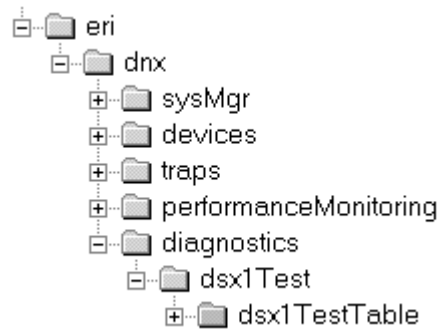


Figure C-6. Diagnostics Branch - Detailed View

DS1/E1 Link Test Statistics

The DS1/E1 Link Test Statistics Table provides test statistics for each DS1/E1 link in the system since the link has been up or since the last time the counts were cleared. This table is indexed by *dsx1TestLinkAddr*. Table C-21 describes each field from the **DS1/E1 Test Statistics Table**.

Table C-21. DS1/E1 Test Statistics Table

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 Test Link Address	Link Port Address (IP Address)	4 digits (1-255)	read-only	This number uniquely identifies a DS1/E1 link resource. This number will be used throughout the system to identify a unique link.
DSX-1 Test Resource ID	Integer	0-4294967295	read-only	Uniquely identifies a link in the system. This number is provided as key to allow the manager to map this entry to a corresponding Resource Table entry.
DSX-1 Test Link State	Integer	0-4294967295	read-only	Determines the current line condition status of the link. In order to turn on a loop, the link must be configured In Service. In Sync (0), Yellow Alarm (2), Sending All Ones (8), Loss of Frame (32), Loss of Signal (64), Red Alarm (2048), Carrier Frame Alignment (4096), Out of Service (65535), Transmit Slip (2097152), Receive Slip (4194304), Severely Errored Frames (8388608), Transmit/Receive Slip (6291456). Multiple Errors will display raw bit field value.
DSX-1 Test Link Loop	Integer	0-75	read-write	Determines the status of the line loopback associated with this link. In order to turn on a loop, the link must be configured as In Service . Disabled (0), Local (1), Remote (2), Line (3), Payload (4), Analog (5), SmartJack (6), Loop Up Request (74) - Remote loop status indicator, CANNOT be used in SET. Loop Down Request (75) - Remote loop status indicator, CANNOT be used in SET.
DSX-1 Test Back-plane Loop	Integer	20-21	read-write	Determines whether or not the link has connection loopback via the Back-plane. This affects a data connection which must already be in place prior to invoking this function. Off (20) or On (21).

Table C-21. DS1/E1 Test Statistics Table (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 Test BERT State	Integer	50-71	read-write	Indicates the current BERT test running and can be used to start and stop a desired Test Period. In order to turn on a loop, the link must be configured as In Service . Off (50), all-ones (51), all-zeros (52), unframed 2047 (53), unframed 2 ¹⁵ (54), unframed 2 ²⁰ (55), unframed 2 ²³ (56), unframed 2 ¹¹ with 7 zeros (57), unframed 2 ¹⁵ with 7 zeros (58), unframed QRSS (59), unframed 2 ²³ with 14 zeros (60), framed 2047 (61), framed 2 ¹⁵ (62), framed 2 ²⁰ (63), framed 2 ²³ (64), framed 2 ¹¹ with 7 zeros (65), framed 2 ¹⁵ with 7 zeros (66), framed QRSS (67), framed 2 ²³ with 14 zeros (68), all-2047 (70 - only valid on HDS3), or system-2047 (71).
DSX-1 Test Duration	Counter	0-4294967295	read-write	The total number of seconds that the test data has been collected.
DSX-1 Test Bit Errors	Counter	0-4294967295	read-only	The total number of bits in error since the test has been running.
DSX-1 Test ES	Counter	0-4294967295	read-only	The total number of Errored Seconds that have occurred on the local link since the test has been running.
DSX-1 Test Remote Errored Seconds	Counter	0-4294967295	read-only	The total number of errored seconds that have occurred that have occurred on the remote link since the test has been running.
DSX-1 Test Error-Free Seconds	Counter	0-4294967295	read-only	The total number of error-free seconds that have occurred since the test has been running.
DSX-1 Test SES	Counter	0-4294967295	read-only	The total number of Severely Errored Seconds (SES) that have occurred since the test has been running.
DSX-1 Test UAS	Counter	0-4294967295	read-only	The total number of Unavailable Seconds (UAS) that have occurred since the test has been running.
DSX-1 Test AS	Counter	0-4294967295	read-only	The total number of Available Seconds (AS) that have occurred since the test has been running.

Table C-21. DS1/E1 Test Statistics Table (Continued)

Field Name	SNMP Type	Size/Range	Access	Description
DSX-1 Test ES Non-UAS	Counter	0-4294967295	read-only	The number of Error Seconds (ES) which are not part of the Unavailable Seconds (UAS) that occurred since the test has been running.
DSX-1 Test Severe Error	Integer	1-255	read-write	The number of bits in error in a given second that determine a Severely Errored Second.
DSX-1 Test Bit Speed	Integer	0-4294967295	read-only	Current bit rate for which the link is configured.
DSX-1 Test Command Status	Integer	1-206	read-write	The command status for the Ds1/E1 Test Row. The value used in a SET will be replaced by a response value in the GET RESPONSE indicating success or failure.

SNMPv1 Traps

The SNMPv1 Traps Branch is shown in Figure C-7.

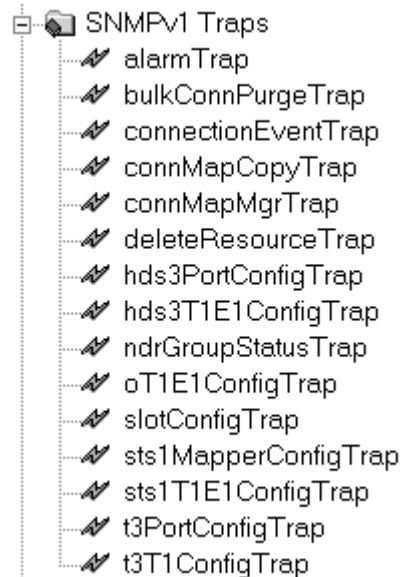


Figure C-7. SNMP Traps - Detailed View

In the MIB there are 15 different traps. The modules that provide trap information are the System Manager (SMC II), Octal T1/E1, DS3, Hybrid DS3 and the STS1 modules. Table C-22 shows the traps that are provided and the definition of the trap. All of the traps contain underlying information that pertains to that particular trap. For example, the Alarm trap contains eight tables that are used to define the type of alarm. Information describing the alarm is available within the trap in the form of tables; trap sequence number, resource number, trap time (date/time), resource address string, resource type, trap type (identifies different alarm codes), resource state (bit flag) and trap severity. This information is key to determining the type and severity of the alarm that is posted in the system. There is a number used to identify the last generated trap message. This is also included in each trap PDU to help the NMS to realize if a trap has been missed.

Table C-22. Trap Definitions

Trap Type	MIB Module	Definition	Provisioning Trap	Module Type
Alarm	ERI-DNX-SMC-MIB	Sends alarms to the NMS.	No	SMC
Delete Resource	ERI-DNX-SMC-MIB	Notifies the NMS that a resource has been deleted.	No	SMC
Connection Event	ERI-DNX-SMC-MIB	Notifies the NMS that a connection has been changed, added, or deleted.	Yes	SMC
Connection Map Manager	ERI-DNX-SMC-MIB	Notifies the NMS that a new map has been activated or that a connection map has been successfully copied to another inactive map.	Yes	SMC
Slot Configuration	ERI-DNX-SMC-MIB	Notifies a NMS that a user has updated the configuration for a given slot entry.	Yes	SMC
Connection Map Copy	ERI-DNX-SMC-MIB	Notifies a NMS that a user has copied all connections from a source map to another destination map indicated by the connection Map ID.	Yes	SMC
Bulk Configuration Purge	ERI-DNX-SMC-MIB	Notifies users that due to a change in the device/port configuration, all connections affected by the changed resource have been purged.	No	SMC
NDR Group Status	ERI-DNX-SMC-MIB	Notifies the NMS that due to an alarm condition or system state change, the N+1 redundancy groups have been modified.	No	SMC
Configuration Link	ERI-DNX-OCTAL-T1E1-MIB	Notifies the NMS that a user has the link configuration for a given T1/E1 port entry.	Yes	OT1/E1
Configuration Link	ERI-DNX-T3-MIB	Notifies the NMS that a user has updated the link configuration for a given T3-T1 channel entry.	Yes	DS3
Port Configuration	ERI-DNX-T3-MIB	Notifies the NMS that a user has updated the link configuration for a given T3 port entry.	Yes	DS3
Configuration Link	ERI-DNX-STS1-MIB	Notifies the NMS that a user has updated the link configuration for a given STS1 T3-T1 channel entry.	Yes	HDS3
Mapper Configuration	ERI-DNX-STS1-MIB	Notifies the NMS that a user has updated the link configuration for a given STS1 mapper entry.	Yes	HDS3
Configuration Link	ERI-DNX-HDS3-MIB	Notifies the NMS that a user has updated the link configuration for a given HDS3 T1-E1 channel entry.	Yes	STS1
Port Configuration	ERI-DNX-HDS3-MIB	Notifies the NMS that a user has updated the link configuration for a given HDS3 port entry.	Yes	STS1

Provisioning Traps

Event Traps are used to support the SNMP provisioning functionality. Each trap is issued upon successful completion of the requested command/action. No traps are issued for failed or incomplete commands. Each trap will contain a Trap Sequence Number as a variable in the list. This number will be initialized to 1 for the first Enterprise-specific trap after system startup and will eventually wrap back to 1 when the largest 4 byte integer (4294967295) is reached.

Connection Event Trap

The Connection Event Trap is sent to all configured trap clients whenever a connection is changed, added, or deleted. An entry from the **System Connection Table** is identified by index and the **sysCfgCmdStatus** is included to indicate the event that has been successfully executed. A notification of the event does not constitute a permanent change to the Connection Database which can only be done by issuing a *Save* command for the affected Connection Map.

Connection Map Manager Trap

The Connection Map Manager Trap is sent to all configured trap clients whenever a Connection Map is activated, changed, or when a connection map is successfully copied over from another map. An entry from the **Connection Map Table** is identified by index and the **connMapCmdStatus** is included to indicate the event that has been successfully executed. Currently saving or updating a Connection Map does not generate this trap.

Slot Configuration Trap

The Slot Configuration Trap is sent to all configured trap clients whenever a slot configuration is modified, cleared, or manually switched or restored. An entry from the **Slot Configuration Table** is identified by slot number and the **slotConfigCmdStatus** is included to indicate the event that has been successfully executed.

Map Copy Trap

The Map Copy Trap is sent to all configured trap clients whenever a user has copied all connections from a source map (***lastMapCopied***) to another destination map indicated by **connMapID**.

Bulk Connection Purge Trap

The Bulk Connection Purge Trap is sent to all configured trap clients to notify users that due to a change in device/port configuration, all connections affected by the changed resource have been purged. The Resource key can be used to identify which resource was re-configured causing connections to be removed and the Map ID identifies which Connection Map was purged. The **connMapCounts** field indicates the total number of connections deleted.

NDR Group Status Trap

The NDR Group Status Trap is sent to all configured trap clients to notify NMS that due to an alarm condition or system state change, the N+1 Redundancy Groups have been modified. This means the one or more devices have been removed or added to the actual N+1 Redundancy Groups and this will affect which cards will be protected (switched) in the event of a failure.

Alarm Traps

Alarm Traps are used to report an alarm condition that exists within the DACS II AX unit. The following information describing the alarm is available within the trap in the form of tables: trap sequence number, resource number, trap time (date/time), resource address string, resource type, trap type (identifies different alarm codes), resource state (bit flag) and trap severity. This information is used to determine the type and severity of the alarm condition that is being reported.

Alarm Trap Type Tables

Table C-23 through Table C-36 contain information about the traps and trap codes used to report an alarm condition. There are five severity levels in these SNMP traps. The levels in the order of severity are critical, major, minor, informational, and nominal. The first three levels are alarm levels while the last two levels are non-alarm levels. For the DACS II AX, the severity of the reported alarms will be classified in the tables as one of the following four severity levels:

- Info Only - Provided as a status indicator; non-alarm level.
- Critical Alarm - Highest severity level; generated at the device level. A Critical Alarm can cause switchover if Redundancy is active.
- Major Alarm - Second highest severity level; generated mostly at the port level.
- Minor Alarm - Not used; reserved for future enhancements.

Table C-23. Slot Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	Device type mismatch: The slot does not contain the device type for which it was configured.		X			101	141
2	Device missing: The slot, while configured to hold a device, does not contain a device.		X			102	142
3	Device not present: The slot does contain a device.	X					

Table C-24. Device Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
-	Device Cold Start	X				1	
-	Device Warm Start	X				2	
0	No alarm.	X					
1	In online state.	X				201	241
2	In standby state.	X				202	242
3	Frame sync not present.		X			203	243
4	System clock not present.		X			204	244
6	SMCs database not in sync.			X		206	246
7	Clock free run error.		X			207	247
8	In offline state.		X			208	248
9	In defective state.		X			209	249
10	In bus error state.		X			210	250
25	Configuration error.			X		225	265
26	Cannot be clock source.	X					
27	Error counters not zero.	X				227	
28	No rear card.		X			228	268
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				231	271

Table C-25. T1/E1 Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	Receiving far end loss of frame (receiving yellow alarm).			X		301	341
2	Near end sending loss of frame (transmitting yellow alarm).			X		302	342
3	Far end sending alarm indication signal.			X		303	343

Table C-25. T1/E1 Alarm Level (Continued)

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
4	Near end sending alarm indication signal.			X		304	344
5	Near end loss of frame (red alarm).			X		305	345
6	Near end loss of signal.			X		306	346
7	Near end is looped.	X					
8	E1 TS16 alarm indication signal.			X		308	348
9	Far end sending TS16 LOMF.			X		309	349
10	Near end sending TS16 LOMF.			X		310	350
11	Near end detected test code.	X					
12	Other line status.			X		312	352
13	Near end in unavailable signal state.			X		313	353
14	Carrier equipment out of service.	X				314	354
15	DS2 payload alarm indication signal.			X		315	355
16	DS2 performance threshold exceeded.			X		316	356
21	Near end transmit Slip.			X		321	361
22	Near end receive Slip.			X		322	362
23	Near end severely errored frame.			X		323	363
24	Change in frame alignment.			X		324	364
25	Configuration error.			X		325	365
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				331	371

Note 1: Although *No rear card* is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.

Table C-26. DS3 Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	Receiving far end loss of frame (receiving yellow alarm).			X		501	541
2	Near end sending loss of frame (transmitting yellow alarm).			X		502	542
3	Far end sending alarm indication signal.			X		503	543
4	Near end sending alarm indication signal.			X		504	544
5	Near end loss of frame.			X		505	545
6	Near end loss of signal.			X		506	546
7	Near end is looped.	X					
11	Near end detected test code.	X					
12	Other line status.			X		512	552
13	Near end in unavailable signal state.			X		513	553
14	Carrier equipment out of service.	X				514	554
15	Near end severely error frame.			X		515	555
16	Clock failure.			X		516	556
17	Far end block error.			X		517	557
18	PBIT or CBIT parity error.			X		518	558
19	MBITS in error.			X		519	559
6	LIU digital loss of signal.			X		506	546
6	LIU analog loss of signal.			X		506	546
22	LIU excessive zeros.			X		522	562
23	LIU line coding violation.			X		523	563
24	LIU PRBS error.			X		524	564
25	Configuration error.			X		525	565
26	Cannot be clock source.	X					
27	Error counters not zero.	X					

Table C-26. DS3 Port Alarm Level (Continued)

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				531	571
29	Clock source.	X					
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-27. High Speed Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	Receive FIFO error.			X		401	441
2	Transmit FIFO error.			X		402	442
3	Clock edge error.			X		403	443
7	Near end is looped.	X					
11	Near end detected test code.	X					
12	Carrier detected.	X					
24	No backplane timeslot assigned.	X				424	464
25	Configuration error.			X		425	465
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				431	471
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-28. OCU Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
6	Near end loss of signal.			X		706	746
7	Near end is looped.	X					
11	Near end detected test code.	X					
12	Other line status.			X		712	752
23	Near end severely errored frame.			X		723	763
25	Configuration error.			X		725	765
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				731	771
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-29. TAM Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
7	Near end is looped.	X					
11	Near end detected test code.	X					
25	Configuration error.			X		825	865
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				831	871
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-30. Voice Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
7	Near end is looped.	X					
11	Near end detected test code.	X					
25	Configuration error.			X		925	965
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				931	971
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-31. Router Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	User alarm (1)					1201	1241
2	User alarm (2)					1202	1242
3	User alarm (3)					1203	1243
25	Configuration error.			X		1225	1265
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				1231	1271
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-32. HDS3 Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
3	Far end sending alarm indication signal.			X		1403	1443
4	Near end sending alarm indication signal.			X		1404	1444
5	Near end out of frame.			X		1405	1445
6	Near end loss of signal.			X		1406	1446
7	Near end is looped.	X					
8	Near end LOF (red alarm)			X		1408	1448
9	Far end received failure error.			X		1409	1449
11	Near end line code violation error.			X		1411	1451
12	Near end framing error.			X		1412	1452
13	Near end excessive zeros.			X		1413	1453

Table C-32. HDS3 Port Alarm Level (Continued)

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
14	Carrier Equipment Out of Service	X				1414	1454
17	Far end block error.			X		1417	1457
18	PBIT or CBIT parity error.			X		1418	1458
20	LIU digital loss of signal.			X		1420	1460
21	LIU analog loss of signal.			X		1421	1461
22	LIU excessive zeros.			X		1422	1462
23	LIU line coding violation.			X		1423	1463
24	LIU PRBS error.			X		1424	1464
25	Configuration error.			X		1425	1465
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				1431	1471
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-33. STS1 Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	Receiving far end loss of frame (receiving yellow alarm).			X		1301	1341
2	Near end sending loss of frame (transmitting yellow alarm).			X		1302	1342
3	Far end sending alarm indication signal.			X		1303	1343
4	Near end sending alarm indication signal.			X		1304	1344
5	Near end loss of frame (red alarm).			X		1305	1345
7	Near end is looped.	X					

Table C-33. STS1 Port Alarm Level (Continued)

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
8	Near end loss of pointer.			X		1308	1348
9	Near end out of frame.			X		1309	1349
10	Near end sending alarm indication signal.			X		1310	1350
11	Near end detected test code.	X					
12	Other line status.			X		1312	1352
13	Near end loss of signal.			X		1313	1353
14	Carrier equipment out of service.	X				1314	1354
15	Near end sever errored frame						
16	Clock failure.			X		1316	1356
17	Loss of multi frame indication.			X		1317	1357
18	Error in received path trace.			X		1318	1358
20	LIU digital loss of signal.			X		1320	1360
21	LIU analog loss of signal.			X		1321	1361
22	LIU excessive zeros.			X		1322	1362
23	LIU line coding violation.			X		1323	1363
24	LIU PRBS error.			X		1324	1364
25	Configuration error.			X		1325	1365
26	Cannot be clock source.	X					
27	Error counters not zero.	X					
28	No rear card.	X Note 1					
29	Clock source.	X					
30	In test.	X					
31	Out of service.	X				1331	1371
Note 1: Although <i>No rear card</i> is reported on a port level, it is not an alarm of a port. This alarm is being reported on a device level.							

Table C-34. Power Supply Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	Power supply not present.			X		601	641
2	Power supply not ok.			X		602	642

Table C-35. Protection Switch Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
1	Device online.	X					
3	Power supply A not ok.			X		1003	1043
4	Power supply B not ok.			X		1004	1044
5	Fan 1 not ok.			X		1005	1045
6	Fan 2 not ok.			X		1006	1046
7	Fan 3 not ok.			X		1007	1047
9	PSX Config Mismatch.			X		1009	1049
14	Line card 1 not present.	X					
15	Line card 2 not present.	X					
16	Line card 3 not present.	X					
17	Line card 4 not present.	X					
18	Line card 5 not present.	X					
19	Line card 6 not present.	X					
20	Line card 7 not present.	X					
21	Line card 8 not present.	X					
22	Line card 9 not present.	X					
23	Line card 10 not present.	X					
24	Line card 11 not present.	X					

Table C-36. Protection Switch Line Card Port Alarm Level

Bit	Description	Info Only	Critical Alarm	Major Alarm	Minor Alarm	SNMP Set Trap Type Code	SNMP Clear Trap Type Code
0	No alarm.	X					
2	Line card switched to spare.			X		1102	1142
3	Line card cable missing.		X			1103	1143
4	Line card cable not present.	X					
5	Line card not present.	X					
6	Line card missing.		X			1106	1146
7	Line card type mismatch.		X			1107	1147
8	Line card relay malfunction.		X			1108	1148

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.

DHCP - Dynamic Host Configuration Protocol. A protocol that allocates dynamic IP addresses to client stations logging onto a TCP/IP network, so that addresses can be reused when hosts no longer need them. Eliminates having to manually assign permanent IP addresses.

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 is 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).

T

T1 - A high-bandwidth telephone trunk line with a capacity of 1.544 Mbps, used in North America. T1 is channelized into 24 DS0s, 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

Acronym/Abbreviation	Name
AC	Alternating Current
ACO	Alarm Cut Off
ADPCM	Adaptive Differential Pulse Coded Modulation
AIS	Alarm Indication Signal
AMI	Alternate Mark Inversion
ANI	Automatic Number Identification
ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange
ATM	Asynchronous Transfer Mode
AUI	Attachment Unit Interface
AWG	American Wiring Gauge
B8ZS	Binary with 8 Zero Substitution
BER	Bit Error Rate
BERR	Bit Error Counter
BERT	Bit Error Rate Test
BES	Bursty Errored Seconds
bps	Bits per second
CAS	Channel Associated Signaling
CERR	CRC Errors
CLEC	Competitive Local Exchange Carrier
CMI	Control Mode Idle
CMOS	Complementary Metal Oxide Semiconductor
CODEC	Encoder/Decoder
CPE	Customer Premises Equipment
CRC	Cyclic Redundancy Check

Table GL-1. Acronyms & Abbreviations (Continued)

Acronym/Abbreviation	Name
CSU	Channel Service Unit
CTS	Clear to Send
D4	Super Frame
DAC	Digital to Analog Converter
DACS II AX	DACS II Access Cross-Connect
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Circuit-Terminating Equipment
DCS	Digital Cross-Connect System
DDS	Dataphone Digital Service
DHCP	Dynamic Host Configuration Protocol
DID	Direst Inward Dialing
DIP	Dual Inline Package
DLCI	Data Link Control Identifier
DO	Data Out
DNS	Domain Name System
DPT	Dial Pulse Termination
DS0	Digital Signal Level 0
DS1	Digital Signal Level 1
DS3	Digital Signal Level 3
DSL	Digital Subscriber Line
DSR	Data Set Ready
DSU	Data Service Unit
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTR	Data Terminal Ready

Table GL-1. Acronyms & Abbreviations (Continued)

Acronym/Abbreviation	Name
EIA	Electronic Industries Association
E&M	Receive and Transmit
ES	Errored Seconds
ESF	Extended Superframe
FCC	Federal Communications Commission
FPGA	Field Programmable Gate Array
FIFO	First-in, First-out
FS	Failed Seconds
FSS	Failed Signal State
FTP	File Transfer Protocol
FXO	Foreign Exchange Office
FXS	Foreign Exchange Subscriber
HDLC	High-Level Data Link Control
HDSL	High-bit rate Digital Subscriber Line
IAD	Integrated Access Device
IC	Integrated Circuit
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
IPX	Internetwork Packet Exchange
ISDN	Integrated Service Digital Network
ISP	Internet Service Provider
ITU-T	International Telecommunications Union - Telecom
IXC	Inter-exchange Carrier
Kbps	Kilobits per second
LAN	Local Area Network
LBO	Line Build Out

Table GL-1. Acronyms & Abbreviations (Continued)

Acronym/Abbreviation	Name
LED	Light Emitting Diode
LIU	Line Interface Unit
LL	Local Loop
LOF	Loss of Frame
LOS	Loss of Signal - DS1
MAIS	Multiframe AIS
Mbps	Megabits per second
MERR	MFAS Error
MFAS	Multiframe Alignment Sequence (CRC4 format)
MIB	Management Information Base
MYEL	Multiframe Yellow Alarm
NSA	Non-Signaling Associated
NAT	Network Address Translation
NEBS	Network Equipment Building Systems
NDR	N+1 Device Redundancy
NDRG	N+1 Device Redundancy Group
NI	Network Interface
NVT	Network Virtual Terminal
OCU	Office Channel Unit
OSPF	Open Shortest Path First
PCM	Pulse Coded Modulation
PCS	Personal Communications Service
PLAR	Private Line Auto Ring
QOCU	Quad Office Channel Unit
RED	Red Alarm
RL	Remote Loop

Table GL-1. Acronyms & Abbreviations (Continued)

Acronym/Abbreviation	Name
RTS	Request to Send
RXCLK	Receive Clock
SDSL	Single-line Digital Subscriber List
SES	Severely Errored Seconds
SMC	System Manager Card
SNMP	Simple Network Management Protocol
SONET	Synchronous Optical Network
STS-1	Synchronous Transport Signal Level 1
SYNC	Synchronous
TCP	Transmission Control Protocol
TDM	Time Division Multiplexing
TFTP	Trivial File Transfer Protocol
UDP	User Datagram Protocol
VAN	Value Added Network
VT	Virtual Tributary
WAN	Wide Area Network
YEL	Yellow Alarm

Index

A

AC0 (Alarm Cut Off) button, [3-14](#)
Active Map, [5-9](#)
Active Test, [5-15](#)
Alarm Contacts
 Router Module, [20-39](#)
 SMC II, [9-6](#)
Alarms
 Displaying Detail, [3-11](#)
Amps
 Protection Switch, [1-11](#), [1-17](#), [10-12](#)
Application Module
 Installation, [2-20](#)
 Upgrading Program File, [A-6](#)
Application/Interface Module Sets
 Specifications, [1-14](#)
 Supported, [1-12](#)
ARP Table, [7-16](#)
Audit Trail Identifier, [4-20](#)

B

BRC, [5-14](#)
BRM, [5-14](#)
Broadband Redundancy, [10-14](#)
Broadcast Connection, [5-14](#)
Broadcast Master, [5-14](#)
Bus Speed, [7-26](#)

C

Clock Source, [8-4](#)
Connection Filters, [5-16](#)
Connection Maps Manager Menu, [5-8](#)
Connection Name, [5-17](#)
Copy Files to Standby SMC, [7-5](#)
Critical alarm
 device missing, [9-12](#)
 no second SMC present, [9-16](#)
Cross-Connect
 Active Test, [5-15](#)
 Destination (Dest), [5-14](#)
 Source (Src), [5-14](#)
 Speed, [5-14](#)
 Tester Port, [5-15](#)
 Testing, [5-41](#)
 Type, Voice or Data, [5-14](#)

D

Date and Time, [5-9](#)

DB-25 to V.35 Cable Adapters, [B-13](#)
Default Gateway, [4-24](#)
Device State, [3-6](#), [3-7](#)
DHCP Server, [20-104](#)
DHCP/Bootp Relay, [20-45](#)
Document conventions, [xlv](#)
DS0 level Testing, [5-41](#)
DS0-A, [19-28](#)
DS0-A Special, [19-26](#)
DS-3
 LEDs, [13-5](#)
 Loops, [13-21](#)
 Physical Description, [13-5](#)
 Redundancy, [13-42](#)
 Reset Module, [13-38](#)
 Version, [13-46](#)
DS3 Redundancy, Cable for, [B-22](#)

E

Enable RIP, [4-24](#)
Ethernet 10BaseT, [B-3](#)
Event Log, [6-3](#)

F

FDX, [5-14](#)
Filters
 IPX SAP, [20-99](#)
 OSPF Route, [20-91](#)
 RIP Route, [20-94](#)
Full-Duplex, [5-14](#)
Fuse Requirements, [1-18](#), [2-11](#)

H

Help Menu, [2-32](#)
Hold Over timing, [8-6](#)
Host Directory, [4-36](#)
Host File Name, [4-36](#)
Host IP Address, [4-36](#)

I

Installation
 Application Module, [2-20](#)
 DACS II AX-11
 AC Power, [2-12](#)
 DC Power, [2-13](#)
 Rack Mounting, [2-5](#), [2-6](#), [2-7](#)
 DACS II AX-4
 AC Power, [2-14](#)
 DC Power, [2-15](#)
 Rack Mounting, [2-8](#)
 Protection Switch, [2-21](#)
Interface Cards, [10-12](#)

IP Address, [4-23](#)
IP Encapsulation, [4-24](#)
IP Multicast Group, [20-51](#)
IP Route Table, [7-12](#)

L

LAN IP Address, [4-24](#)
LAN IP Mask, [4-24](#)
L-DEST, [5-14](#)
Listen-Destination, [5-14](#)
Listening, [5-37](#)
Listen-Source, [5-14](#)
L-SRC, [5-14](#)

M

Map Configuration, [5-9](#)
Map Definition, [5-9](#)
Maps
 Copying, [5-46](#)
 Scheduling, [5-48](#)
Menu Navigation, [2-31](#)
Menu Structure, [2-34](#)
MIB Table, [7-9](#)
Monitor-Dest, [5-15](#) [5-43](#)
Monitor-Src, [5-15](#) [5-42](#)

N

Narrowband Redundancy, [10-14](#)
Node Summary Menu, [3-4](#)
NxDS0 Special, [19-28](#)

O

Octal High Speed Cables, [B-15](#)
Octal High Speed Data
 BERT Test, [19-18](#)
 Control Signals, [19-15](#)
 LED Indicators, [19-6](#)
 Local Loopback, [19-16](#)
 Physical Description, [19-5](#)
 Port Timing, [19-9](#)
 Remote Loopback, [19-17](#)
 Remote OCU Non-Latching Test, [19-19](#)
 Reset Device, [19-43](#)
 Supported Electrical Interfaces, [19-12](#)
 V.54 Loopback, [19-17](#)
 Version, [19-46](#)
Octal T1/E1
 Board Status, [17-44](#)
 Cable Tie Mounts, [17-11](#)
 ESF Statistics, [17-31](#)
 LEDs, [17-5](#)
 Line Type, [17-15](#)
 Link Status, [17-28](#)

Links Configuration, [17-13](#)
Loops, [17-25](#)
Physical Description, [17-5](#)
Redundancy Information, [17-46](#)
Reset Module, [17-43](#)
Slot Configuration, [17-12](#)
Version, [17-49](#)
Octal T1/E1 Interface, [B-8](#)
Octal T1/E1 Redundancy, Cable for, [B-23](#)
Octal Voice
 Talk Battery, [2-16](#)
Octal Voice Rear Interface Cards, [B-10](#)
OSPF, [20-47](#) [20-74](#) [20-81](#) [20-85](#) [20-88](#)

P

Ping, [7-10](#)
Port Configuration Menu, [4-23](#)
Protection Switch
 Air Filter, [10-46](#)
 Cable to DACS II AX, [B-25](#)
 Controller Card, [2-24](#)
 Fan Assembly, [10-48](#)
 Installation, [2-21](#)
 Power Requirements, [1-11](#) [1-17](#) [10-12](#)
 Requirements, [10-12](#)
 Switchover Criteria, [10-33](#)
Protection Switch Redundancy Options, [10-26](#)

Q

Quad DS-1
 Bit Error Rate Test, [11-26](#)
 Cascade LEDs, [11-14](#) [15-11](#)
 Configuration Fields, [11-14](#) [15-11](#)
 Diagnostics, [11-24](#)
 ERROR LED, [11-31](#)
 ESF Registers, [11-21](#) [11-22](#)
 ESF Statistics, [11-18](#) [11-19](#)
 LEDs, [11-14](#) [15-11](#)
 LEDs, [11-5](#)
 Loop Selections, [11-28](#)
 Loop Type, [11-25](#)
 Main Menu, [11-16](#)
 Physical Description, [11-5](#)
 Regulatory Information, [11-6](#)
 Slot Configuration, [11-11](#) [12-8](#) [13-8](#) [14-8](#) [15-8](#) [16-6](#)
 [17-12](#) [19-21](#) [20-12](#) [21-10](#) [22-11](#)
 Statistics, [11-18](#)
 Trunk Conditioning, [11-40](#)
 Utilities, [11-30](#)
 Version, [11-42](#)
Quad DS-1 Configuration Menu, [11-14](#) [15-11](#)
Quad DS-1 Diagnostics Menu, [11-27](#)
Quad DS-1 with xDSL
 LEDs, [15-5](#)
 Loops, [15-39](#)
 Specifications, [15-62](#)

Quad High Speed
 Cascade LEDs, [12-10](#)
 Configuration Fields, [12-10](#)
 LEDs, [12-3](#)
 Local Loop, [12-17](#)
 Physical Description, [12-3](#)
 Remote Loop, [12-18](#)
 Remote Loop (V.54), [12-21](#)
 Set Board Status, [12-24](#)
 Version, [12-29](#)
Quad High Speed Interfaces, [B-5](#)
Quad OCU
 Board Status, [14-21](#)
 DDS loops, [14-5](#)
 LEDs, [14-3](#)
 Loop selections, [14-16](#)
 Physical Description, [14-3](#)
 Reset Device, [14-26](#)
 Slot Configuration, [14-8](#)
 Version, [14-29](#)
Quad OCU Data Port Interface, [B-7](#)
Quad Port DS-1 Interface, [B-6](#)

R

Redundancy
 Enabling, [10-24](#)
RJ11, [B-4](#)
Router Module
 Alarm Contacts, [20-39](#)
 Board Status, [20-162](#)
 Bridge Address Table, [20-43](#)
 Configuration Parameters, [20-16](#)
 IP Commands, [20-143](#)
 IPX Commands, [20-158](#)
 LAN Commands, [20-131](#)
 LAN Port Configuration, [20-18](#)
 LEDs, [20-9](#)
 Logical Port Configuration, [20-29](#)
 Menus, [20-13](#)
 Physical Description, [20-9](#)
 Reset Device, [20-162](#)
 SNMP Agent, [20-36](#)
 Statistics, [20-121](#)
 Telnet Client Utility, [20-145](#)
 Utilities, [20-129](#)
 Version, [20-166](#)
 WAN Commands, [20-135](#)
 WAN Port Configuration, [20-21](#)

S

Save and Restore Database, [5-9](#)
Secondary Addressing, [20-68](#)
Security Level, [4-20](#)
SMC
 Copying Files to Standby SMC, [7-5](#)
 Switchover, [7-7](#)

 Upgrading SMC Software, [A-4](#)
SMC I
 Description, [1-8](#)
SMC II
 Description, [1-10](#)
Spanning Tree Status, [20-133](#)
Specifications
 Application/Interface Module Sets, [1-14](#)
 DACS II AX-11, [1-17](#)
 DACS II AX-4, [1-17](#)
Split-Dest, [5-15](#) [5-45](#)
Split-Src, [5-15](#) [5-44](#)
Station Clock Inputs, [8-5](#)
Stratum 3 clock, [8-6](#)
Subrate Data, [19-14](#)
Supervisory Bus, [7-25](#)
Switchover, [10-33](#)
System Configuration Menu, [4-6](#)

T

Talk Battery, [2-16](#)
Technical Support, [1-19](#)
Telnet, [A-10](#)
 Copying a Connection Map, [5-11](#)
 Multiple Sessions, [A-11](#)
 Router Module, [20-145](#)
Terminal (TERM) Port, [B-3](#)
Terminal Communications Parameters, [2-27](#)
Test Access Module
 LEDs, [16-3](#)
 Local Loop, [16-21](#)
 Physical Description, [16-3](#)
 Remote Loop, [16-21](#)
 Reset Board, [16-25](#)
 Slot Configuration, [16-6](#)
 Version, [16-28](#)
Tester Port, [5-15](#)
Time and Day Configuration, [5-9](#)
Time of Day Configuration Submenu, [5-48](#)
Timeslot Allocation
 Methods, [5-23](#)
 Viewing, [5-21](#)

U

Utilities Menu, [7-4](#)

