Lucent Technologies
Bell Labs Innovations

DEFINITY® Extender
Rack Model 3000 &
Analog Switch Card Model 3100
ISDN Switch Card Model 3200

System Administrator's Guide

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Notice

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

Your Responsibility for Your System's Security

Toll fraud is the unauthorized use of your telecommunications system by an unauthorized party, for example, persons other than your company's employees, agents, subcontractors, or persons working on your company's behalf. Note that there may be a risk of toll fraud associated with your telecommunications system and, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

You and your system manager are responsible for the security of your system, such as programming and configuring your equipment to prevent unauthorized use. The system manager is also responsible for reading all installation, instruction, and system administration documents provided with this product in order to fully understand the features that can introduce risk of toll fraud and the steps that can be taken to reduce that risk. Lucent Technologies does not warrant that this product is immune from or will prevent unauthorized use of common-carrier telecommunication services or facilities accessed through or connected to it. Lucent Technologies will not be responsible for any charges that result from such unauthorized use.

Lucent Technologies Fraud Intervention

If you *suspect that you are being victimized* by toll fraud and you need technical support or assistance, call the Lucent Technologies National Customer Care Center at 1 800 643-2353.

Federal Communications Commission Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. For further FCC information, see "Customer Support Information" below.

Industry Canada (IC) Interference Information

This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

Le Présent Appareil Numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A préscrites dans le reglement sur le brouillage radioélectrique édicté par le ministère le ministère des Industrie Canada.

Trademarks

DEFINITY is a registered trademark of Lucent Technologies in the US and other countries.

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Call: Lucent Technologies Publications Center
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Indianapolis, IN 46219

Order:

System Administrator's Guide Document No. 555-025-117 Comcode 108445321	**Rack Model 3000** Comcode 408039998 PEC 2174-RAK
Model 3100 Analog Card Comcode 408039980 PEC 2174-ACD	**Model 3200 ISDN Card** Comcode 408088714 PEC 2174-ICD

Support Telephone Number

In the continental US, Lucent Technologies provides a toll-free customer helpline 24 hours a day. Call the Lucent Technologies Helpline at 1 800 242-2121 or your Lucent Technologies authorized dealer if you need assistance when installing programming, or using your system. Outside the continental US, contact your local Lucent Technologies representative.

Warranty

Lucent Technologies provides a limited warranty on this product. Refer to "Limited Warranty" in "Customer Support Information."

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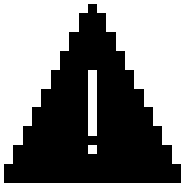
IMPORTANT SAFETY INSTRUCTIONS



The exclamation point in an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

IMPORTANT SAFETY INSTRUCTIONS

To reduce the risk of fire, electrical shock, and injury to persons when installing telephone equipment, always follow basic safety precautions including:

- Read and understand all instructions.
- Follow all warnings and instructions marked on or packed with the product.
- Never install this unit or the telephone wiring for it during a lightning storm.
- Never install a telephone jack in a wet location unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone wiring has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

- Use only Lucent Technologies-manufactured DEFINITY® Enterprise Communications Server (ECS) circuit packs, carrier assemblies, and power units in the DEFINITY® ECS control unit.
- Use only Lucent Technologies-recommended/approved DEFINITY® ECS accessories.
- Do not install this product near water, for example, in a wet basement location.
- Do not overload wall outlets, as this can result in the risk of fire or electrical shock.
- Do not attach the power supply cord to building surfaces. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
- Unplug the product from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use cleaners or aerosol cleaners.
- Do not operate the system if chemical gas leakage is suspected in the area. Use telephones located in some other safe area to report the trouble.

 **WARNING:**

DO NOT open the Rack Power Supply. There are no user serviceable parts inside the unit. Only an authorized technician should open the unit for required maintenance or upgrading purposes.

SAVE THESE INSTRUCTIONS

Customer Support Information

Support Telephone Number

In the USA only
Lucent Technologies provides a toll-free customer Helpline (1 800 242-2121) 24 hours a day. If you need assistance when installing, programming, or using your system, call the Helpline, or your Lucent Technologies authorized representative.

Outside the USA
If you need assistance when installing, programming, or using your system, contact your Lucent Technologies authorized representative.

Security of Your System: Preventing Toll Fraud

As a customer of a new telephone system, you should be aware that there is an increasing problem of telephone toll fraud. Telephone toll fraud can occur in many forms, despite the numerous efforts of telephone companies and telephone equipment manufacturers to control it. Some individuals use electronic devices to prevent or falsify records of these calls. Others charge calls to someone else's number by illegally using lost or stolen calling cards, billing innocent parties, clipping on to someone else's line, or breaking into someone else's telephone equipment physically or electronically. In certain instances, unauthorized individuals make connections to the telephone network through the use of remote access features.

Common carriers are required by law to collect their tariffed charges. While these charges are fraudulent charges made by persons with criminal intent, applicable tariffs state that the customer of record is responsible for payment of all long-distance or other network charges. 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.

Security of Your System: Preventing Toll Fraud *continued*

To minimize the risk of unauthorized access to your Lucent DEFINITY Extender Models 3000, 3100 or 3200:

When possible, restrict the off-network capability of off-premises callers, using calling restrictions, Facility Restriction Levels, and Disallowed List capabilities. When possible, block out-of-hours calling through Time-of-Day Routing. Frequently monitor system call detail reports for quicker detection of any unauthorized or abnormal calling patterns.

Limit Outcalling to persons on a need-to-have basis. Lucent DEFINITY Extender Models 3000, 3100 and 3200, through proper administration, can help you reduce the risk of unauthorized persons gaining access to the network. However, telephone numbers and authorization codes can be compromised when overheard in a public location, lost through theft of a wallet or purse containing access information, or when treated carelessly (writing codes on a piece of paper and improperly discarding them).

Additionally, hackers may use a computer to dial an access code and then publish the information to other hackers. Substantial charges can accumulate quickly. It is your responsibility to take appropriate steps to implement the features properly, to evaluate and administer the various restriction levels, and to protect and carefully distribute access codes.

Under applicable tariffs, you will be responsible for payment of toll charges. Lucent Technologies cannot be responsible for such charges and will not make any allowance or give any credit resulting from unauthorized access.

If you suspect that you are being victimized by toll fraud and you need technical support or assistance, call the Lucent Technologies National Customer Care Center at 1 800 643-2353.

FCC Regulations

Lucent DEFINITY Extender Models 3000, 3100 and 3200, comply with Part 68 of the FCC rules. On the bottom of the Rack is a label that contains the ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

For Public Switch Network: Ringer Equivalence Number (REN): 0.9B

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive REN's on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the REN's should not exceed five. To be certain of the number of devices that may be connected to the line, as determined by the total REN's contact the telephone company to determine the maximum REN for the calling area.

If the Lucent DEFINITY Extender Models 3000, 3100 or 3200 causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. 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 in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

FCC Regulations *continued*

For repair and warranty information, please contact: Lucent Technologies Inc. at 1-800-242-2121.

If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

The FCC prohibits customer provided terminal equipment to be connected to a party line or to be used in conjunction with coin telephone service. Lucent DEFINITY Extender Models 3000, 3100 and 3200 have been registered for permissive operation at -10dBm.

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

Equipment Attachment Limitations

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements.

Industry Canada REN: 0.38

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

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

Users should ensure for their own protection that the electrical ground connections of the power 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.

Limited Warranty

Lucent Technologies Inc. warrants this equipment to be free of defects in materials and workmanship for a period of one year from date of shipment. All defects within this time will be repaired without charge upon return of the unit to the factory.

This warranty is null and void if the manufacturer determines that any modifications have been made to the unit or the unit has been subjected to physical or electrical stress.

This warranty covers parts and labor only, and does not include shipping costs, travel expenses or travel time.

Installation of the equipment is the sole responsibility of the purchaser. The manufacturer, its agents or distributors accept no responsibility for malfunction or damage caused by improper treatment or connection of the unit.

The manufacturer, its agents, or distributors are not liable for any losses incurred through use or malfunction of the equipment or any losses or damages incurred by the use of the equipment in any means whatsoever.

This warranty is limited to the repair of the equipment to its normal functioning capability.

This warranty is complete as stated and all other warranties, expressed or implied, are invalid.

The Lucent DEFINITY Extender Models 3000, 3100 or 3200 should only be installed by qualified personnel. No user serviceable parts are contained within the units. Installation or programming should not begin prior to review of all chapters of this manual.

Software End User License Agreement

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THIS LIMITATION OF LIABILITY SHALL NOT APPLY TO LIABILITY FOR DEATH OR BODILY INJURY TO THE EXTENT APPLICABLE LAW PROHIBITS SUCH LIMITATION. FURTHERMORE, SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THIS LIMITATION AND EXCLUSION MAY NOT APPLY TO YOU.

About This Manual

Intended Audience

This manual is intended to help with the installation, configuration, and maintenance of the Lucent DEFINITY Extender Models 3000, 3100 or 3200. It is intended for use by anyone needing such information, including system administrators, support personnel, and technicians.

Terms and Conventions

The Lucent DEFINITY ® Extender Model 3000 is henceforth referred to as the Rack.

The Lucent DEFINITY ® Extender Model 3100 is henceforth referred to as the Analog Switch Card.

The Lucent DEFINITY ® Extender Model 3200 is henceforth referred to as the ISDN Switch Card.

Switch Cards is a generic term for additional cards that can be installed in the Rack.

Lucent DEFINITY ® ECS is henceforth referred to as DEFINITY ECS, or as the system.

Conventions Used in this Manual

Certain type fonts and styles are used as visual cues to help you rapidly understand the information presented:

Example	Purpose
NOTE: Do not recycle old passwords.	*Italics* indicate a note to add additional reference information.
Enter the new password and click **Change.**	Text in **bold** print is used to indicate a menu option or acceptance block within the Switch Management Interface software.
Example: First Name	Text that is underlined provides an example of the subject matter.

How to Use this Manual

The manual is divided into eight chapters as follows.

Chapter Number	Title	Description
1	Product Overview	Provides a product overview, Rack description and information on analog and ISDN Switch Cards.
2	Specifications	Lists all appropriate electrical, communications, and data specifications.
3	Rack Installation	Provides information for the installation of the Rack. It includes pre-installation checklists and connectivity information.

How to Use this Manual continued

Chapter Number	Title	Description
4	Installing Switch Cards	Explains the steps necessary to quickly install new Switch Cards in the Rack.
5	Configuration	Provides information for configuring the Rack and all Switch Cards to communicate with the appropriate remote modules, using Lucent Technologies Switch Management Interface or a PC running a terminal emulation program.
6	Troubleshooting	Provides step-by-step task lists to determine operational errors, communication errors, and functional problems with the Rack or individual Switch Cards.
7	Software Upgrades	Provides instructions for updating the software to the latest release level.
8	Glossary	Provides a list of terms that are used in the operation or setup of the Lucent Technologies product line.

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Product Overview

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Chapter Contents

1. Product Overview

Introduction

This chapter provides a product overview that includes:

- Product summary
- Product descriptions

Product Summary

The DEFINITY ® Extender Model 3000 is a high-density switch-side device that connects to the DEFINITY ECS' digital line interface. The Rack can be configured with up to 12 Switch Cards, that are sold separately.

The Rack can be configured with up to 12 Switch Cards, in any combination Model 3100 Analog Switch Cards, or the Model 3200 ISDN Switch Cards.

Analog Switch Cards extend one DEFINITY ECS terminal per card for a total of 12 users per Rack, while the ISDN Switch Cards can extend two DEFINITY ECS terminals per card for a total of up to 24 users per Rack. To use the Switch Cards to extend a terminal, the remote user must have an accompanying remote module extender (sold separately). See Table 1-1, next page, for the remote module required to connect to the corresponding Switch Card.

Description	Switch Card Model	Remote Module Model	Number of simultaneous Users per Card
Analog Extenders	3100	1101	1
ISDN Extenders	3200	2101	2

Table 1-1. Remote Module Compatibility

Note: Switch Cards and Remote Modules are sold separately from the Rack. Contact your Lucent Technologies representative for information.

Each remote user is assigned and can communicate with any one or all of the Switch Cards. The system administrator manages remote access to the cards via the Switch Management Interface.

Most features of the system are maintained for transparent functionality. Features include;

- ability to place and receive calls,
- extension-to-extension dialing,
- speed dial,
- transfer calls,
- conference calls,
- access to voicemail,
- auto-attendant,
- and utilization of ACD systems and call accounting software.

What a Typical Installation looks like

Typical installation

The Rack is co-located with the DEFINITY ECS. A remote module is required to connect to the terminal at the off-premises location(s). Figure 1.1 below, illustrates a typical installation.

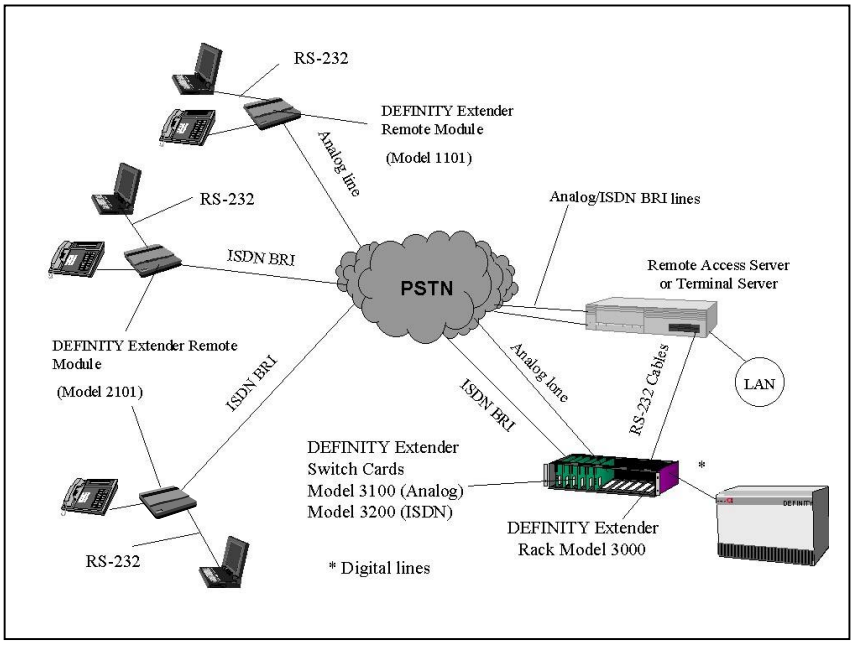

Figure 1.1. Typical Installation

DEFINITY ® Extender Model 3000 Rack Description

Description

DEFINITY Extender Model 3000 is a central site device installed at the DEFINITY ECS location. It is mounted to a chassis in the equipment room and powered by an internal 100-240VAC power supply. The Rack accommodates:

- 12 remote users (using Model 3100 Switch Cards)
- 24 remote users (using Model 3200 Switch Cards)

Phone line

Model 3100
The Rack requires Analog Switch Cards to be installed to provide voice and data connectivity using standard Plain Old Telephone Service (POTS) lines.

Model 3200
The Rack requires ISDN Switch Cards to be installed to provide voice only connectivity using a single ISDN-BRI B-channel.

Backplane

All connections, internal and external, are wired through the Rack backplane. The DEFINITY ECS and Public Switched Telephone Network (PSTN) connections are wired using four 50-pin connectors installed on the backplane.

Data Connection

Model 3100
The backplane provides one data port (COM 0) per Switch Card, allowing connection to the corporate Remote Access Server or Terminal Server. The data connection acts as a simple null modem cable extending the corporate data network to the remote location.

Model 3200
Data connectivity is not supported for the Model 3200 Switch Card.

DEFINITY ® Extender Model 3000 Rack Description

continued

Configuration The administrator can configure, troubleshoot and update every Switch Card in the Rack from a single ADMIN port, using a Windows based management software package.

See the Switch Management Interface section on page 1-9 for more information.

Note: Switch cards can also be configured individually by attaching a VT100 compatible terminal to the port (labeled COM A) on the Rack backplane associated with the Switch Card. See page 5-34 for more information.

DEFINITY ® Extender Model 3100 Card Description

Description

The Analog Switch Card is a Printed Circuit Board (PCB) with circuitry that provides functionality similar to the Model 1100 Switch Module.

Functions include:

- Access to all features of the system.
- Data connectivity via a Terminal Server or Remote Access Server (RAS).

Each Model 3100 Switch Card communicates with one Remote Module Model 1101 (sold separately) and can extend one Lucent terminal.

Remote User Functions

The system is fully transparent to the remote user and retains access to most of the features and functions of the digital phone and telephone switch.

Voice/Data connectivity

Voice and data connectivity is multiplexed over a single analog phone line.

Extender Features

Call on Demand (COD): Reduces long distance line costs by establishing a connection only when a call is detected, or when there is activity on the remote phone.

Dialback: Enables the switch module to disconnect, and then dial back to the remote module after a connection has been successfully completed. After dialback, connection to the remote module is from the system. Using DEFINITY ECS facilities may reduce the cost of the connection.

Note: COD must be disabled for Dialback to operate with Model 3100 Analog Switch Cards.

DEFINITY ® Extender Model 3200 Card Description

Description

The ISDN Switch Card is a PCB (Printed Circuit Board) with circuitry that provides functionality similar to the Model 2100 Switch Module.

Functions include:

- Access to all features of the system.

Each Model 3200 Switch Card communicates with two Remote Modules Model 2101 (sold separately) and can extend two Lucent digital phones.

Remote User Functions

The system is fully transparent to the remote user and retains access to most of the features and functions of the digital phone and telephone switch.

Voice connectivity

Voice connectivity uses both ISDN B-channels. Each Remote Module is connected to a separate B-channel, providing each remote user with a 64Kbps digital link. The Model 3200 Switch Cards can therefore support two remote users per card.

Extender Features

Call on Demand (COD): Reduces long distance line costs by establishing a connection only when a call is detected, or when there is activity on the remote phone.

Dialback: Enables the switch module to disconnect, and then dial back to the remote module after a connection has been successfully completed. After dialback, connection to the remote module is from the system. Using DEFINITY ECS facilities may reduce the cost of the connection.

The Switch Management Interface

Introduction

The DEFINITY Extender Switch Management Interface is a Windows-based software package that provides a user-friendly interface for the DEFINITY Extender system administrator.

The Switch Management Interface, when connected through to the ADMIN port of the Rack, is used for the configuration, status, troubleshooting, monitoring, and software upgrades for all 12 Switch Cards simultaneously.

The Switch Management Interface software is Year 2000 compliant, and requires Windows 95 or 98, or Windows NT 4.0 or higher to operate properly. See *Customer Supplied Equipment* in Chapter 3, for PC requirements.

The ADMIN Port

Switch Cards are configured using the ADMIN Port. The Port is connected to a PC via an RS-232 connector. In addition, Card "0" must contain the Switch Card (3100 or 3200) with the latest revision of software (see page 7-2 for obtaining revision information) to use all features of the Switch Management Interface.

See *How to Connect to the ADMIN port* in Chapter 5 for more information.

Upgrade Process

The Switch Management Interface is used for upgrading the software for the Switch Cards. The administrator can upgrade a single card or multiple cards simultaneously.

Note: For more information on upgrading the Remote Module (Model 1101 for analog lines and Model 2101 for ISDN) see "Upgrading the Remote Module" *in Chapter 7.*

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Specifications

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Chapter Contents

2. Specifications

Introduction

This chapter contains information on specific electrical and mechanical parameters. It is provided as a reference on the design of the Rack and cards.

Minimum Data Rate

Model 3100 Analog Switch Cards

The Model 3100 Analog Switch Cards within the Rack operate on a standard analog line. If the Analog Switch Cards and Remote Modules do not connect at a connect rate of at least 14.4Kbps, contact your local telephone company for the available central office line options.

Note: A 19.2 Kbps connect rate is optimal for voice functionality.

Model 3200 ISDN Switch Cards

The Model 3200 Switch Card operates properly with any Integrated Services Digital Network-Basic Rate Interface (ISDN-BRI) telephone service (2 B-channels plus a D-channel). However, National ISDN-1 service is recommended.

Note: You are responsible for ensuring that the ISDN-BRI service you order is compatible with the internal terminal adapter in the Switch Module. (see page 2-6 for terminal adapter specifications)

Transmission Line Conditions

The DEFINITY Extender Models 3000 and 3100 have been tested under transmission line conditions specified in TSB-37A (a specification which checks modem operation over the equivalent of 95% of the identified analog line types in North America). This means that this equipment should operate properly over nearly all telephone line conditions. However, the actual connect rate will vary based on the quality of the telephone line.

NOTE: *Specifications are subject to change without notice as technological or manufacturing changes warrant.*

North American Safety Standards

North American Safety Standards

The Lucent DEFINITY Model 3000 Rack System, is certified to be compliant to the following North American Safety Standards:

Safety of Information Technology Equipment, Including Electrical Business Equipment	• UL Std. No. 1950-95 • CAN/CSA-C22.2 No. 950-93
Telecommunications Equipment	• UL Std. No. 1459 • CAN/CSA-C22.2 No. 225-M90

Table 2-1. North American Safety Standards

IMPORTANT NOTE: *Caution must be taken, these certifications are subject to the final installation of the system.*

DEFINITY ® Extender Model 3000 Rack Specifications

Item	Specification	Reference Information
Approvals	NRTL/C, FCC, Parts 15 and 68, Class A, Industry Canada	
Size	12 card frame (fits 19" wide rack)	19"W x 5.25"H x 10"D (484mm x 133mm x 255mm)
Capacity	12 Switch Cards	
Number of Remote users	12 (using DEFINITY ® Model 3100 Cards)	24 (using DEFINITY ® Model 3200 Cards)
Power Requirements	One internal regulated power supply, which provides 12VDC and 5VDC.	**Model 3100:** 5 Volts at 600 mA 12 Volts at 100 mA **Model 3200:** 5 Volts at 600 mA 12 Volts at 50mA
User Data Port	RS-232	Supported Data Ports: **Model 3100**: 1 **Model 3200**: 0
Administrative port	RS-232 serial (DB-9, female) connector	1 port for entire Rack
PSTN connectors	Two 50-pin male connectors	One connector per six Switch Cards
ECS Digital port connectors	Two 50-pin male connectors	One connector per six Switch Cards
Electrical Requirements	100-240 VAC 2.2 amps max 47-63Hz.	
Environmental Requirements	Ambient Temperature: 0 – 55 Degrees C Relative Humidity: 0 – 95%	Provide adequate ventilation

Table 2-2. Rack Specifications

DEFINITY ® Extender Model 3100 Card Specifications

Specification	Description
Approvals	NRTL/C, FCC, Parts 15 and 68, Class A, Industry Canada
Communication	
Modem Connect Rates	*Auto*, 14.4, 16.8, 19.2, 21.6, 24.0, 26.4, 28.8, 31.2, 33.6Kbps
Voice Compression	G.723.1 (6.3Kbps)
Data Type	Rockwell V.34 internal modem
Data Impedance	600 Ohms
Data Tx Level	–10 dBm (+1 dBm/–3 dBm)
Data Rx Sensitivity	– 9 to - 43 dBm
User Data Port	
Data Type	RS-232, using COMA on Rack.
Data Rate Settings	2.4 Kbps, 4.8 Kbps, 9.6 Kbps, 19.2 Kbps, *38.4 Kbps*, 57.6Kbps, 115.2 Kbps
Parity Setting	*None*, Even, Odd
Data Bits Setting	7, *8*
Stop Bits Setting	*1* or 2

Table 2-3. Analog Switch Card Specifications

Note: Default settings in Italics.

DEFINITY ® Extender Model 3200 Card Specifications

Specification	Description
Approvals	NRTL/C FCC, Part 15, Class A

ISDN Interface

Interface type	U interface, with built-in NT-1
Max. distance from CO	18000 feet (for longer distances, ISDN repeater is required).
ISDN ordering code	Bellcore package M or S (switched Voice/Data on both B channels)

Table 2-4 ISDN Switch Card Specifications

Note: Default settings in Italics.

Rack Installation

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Chapter Contents

3. Rack Installation

Introduction This chapter provides the following information:

- Pre-installation requirements
- How to install the Rack hardware
- How to wire the Rack backplane for connections to the PSTN and DEFINITY ECS.
- Complete power-up sequence

Lucent Supplied Equipment

Model 3000

- One twelve slot Rack mountable chassis
- One power cord
- One System Administrator's Guide
- Switch Management Interface software (2 disks)

Model 3100 or 3200 (sold separately from Rack)

- One Analog or ISDN Switch Card
- One Quick Installation Guide

Operational Considerations

- The Rack is to be used with DEFINITY ECS Version 3, Release 3 or later.
- Order a separate analog POTS line or ISDN line at each remote module location.
- Each Model 3100 Switch Card will need a digital port (extension) from the DEFINITY ECS, and an analog line from the Central Office (CO) or the DEFINITY ECS.
- Each Model 3200 Switch Card will need two digital ports from the DEFINITY ECS, and a BRI line from the CO or from the DEFINITY ECS.
- Be sure that the DEFINITY ECS digital port to which the Switch Card is connected is programmed correctly for the telephone type being used at the remote location.
- Remote Modules, telephones and communication line cords are NOT supplied with this system.
- Use two-wire digital display phones only.

Customer Supplied Equipment

The customer must supply the following equipment:

- *DEFINITY ECS telephone*
- *DEFINITY Extender Remote Module*
- *DEFINITY ECS* two-wire, 24-port TN-2224 circuit pack or the older 16 port TN2181.
- Any additional DEFINITY ECS circuit packs needed, for example, if more trunking capabilities are needed, you may need to order a TN-747B. (See the *DEFINITY Communications System Generic 3, Installation for Single-Carrier Cabinets* manual, document #555-230-894, comcode #107595423, for further information).
- Power and central office line suppresser. Lucent Technologies recommends the 147C AC/CO Line Surge Protector (#8310-006). Contact your Lucent Technologies representative for ordering instructions.
- Four 50-pin female connectors (two connectors for every six Switch cards)
- A computer for installing and using the Switch Management Interface. Minimum requirements as shown in Table 3.0 below:

	Minimum
Processor	486 DX2 66MHZ
RAM	16MB
Operating Systems	WIN 95, WIN 98, or Windows NT 4.0
Disk Drive	3 ½ Floppy Disk
Free Disk Space	6.0 MB

Table 3-0. Minimum PC Requirements

How to Prepare the Site for Installation

***IMPORTANT NOTE**: Lucent Technologies recommends that this system be professionally installed by Telecommunications Technicians within an access restricted environment, or within an enclosed rack, and installed by Lucent trained technicians.*

Location Checklist

- ❑ The maximum length of cable between the Rack and the DEFINITY ECS is 500 ft (150 meters).
- ❑ The Rack's power supply and cabling should be installed away from high power/high RF noise devices such as computers, fans, fluorescent ballast, power supplies, etc.
- ❑ Use good wiring practices. Do not run wires over fluorescent lights, computers, air conditioners, etc. as this can introduce noise to the modems.
- ❑ The Rack must be installed in a secure location. Unauthorized access to the Rack could lead to toll fraud.

Reference Document

Refer to the *DEFINITY ECS Communications System Generic 3, Installation for Single-Carrier Cabinets* manual, document #555-230-894, comcode #107595423, for further information.

Installation Requirements

- ❑ Four 25-pair cables with female connectors for each Rack
- ❑ One DCP line for each Model 3100 Switch Card
- ❑ One analog line for each Model 3100 Switch Card
- ❑ Two DCP lines for each Model 3200 Switch Card
- ❑ One BRI circuit for each Model 3200 Switch Card
- ❑ 110-blocks sufficient for the installation
- ❑ Additional cables sufficient for the DCP and analog lines.

DEFINITY ECS Checklist

- ❑ Install 110-blocks
- ❑ Connect the DCP lines from the DEFINITY ECS to the wall-field.
- ❑ Connect two of the 25-pair cables to the Rack digital ports (P106 and P108)

Continued on next page

DEFINITY ECS Checklist *continued*

- ❑ Cross-connect the Rack digital ports to the DEFINITY DCP lines (see Tables 3-2 and 3-3 in this Chapter)
- ❑ Connect the analog lines from the PSTN or DEFINITY ECS to the wall-field.
- ❑ Connect the two remaining 25-pair cables to the Rack PSTN ports (P107 and P105).
- ❑ Cross-connect the Rack PSTN ports to the analog lines (see Tables 3-4 and 3-5 in this Chapter)

Electrical Requirements

The system has been designed to operate from 100-240VAC 47-63Hz. Power should not be applied to the Rack until instructed. (see page 3-17 *"Before you Power Up the Rack"*)

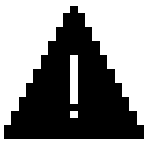
Phone Line Requirements

Model 3100 - Standard analog lines from the CO, or analog lines off circuit packs of the DEFINITY ECS, (TN746B).

Model 3200 – Standard BRI lines from the CO, or a BRI line off the circuit packs of the DEFINITY ECS, (TN2198).

Note: when ordering BRI lines from the CO, use Bellcore ISDN Ordering Code (IOC) package M or S.

Safety Checklist



- ❒ Never install telephone wiring during a lightning storm.
- ❒ Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- ❒ Never touch non-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

Rack Backplane Connectors

Introduction Figure 3.1, shown below, illustrates the Rack backplane. All connectors, both RS-232 and 50-pin, are labeled. Detail "A" details the COMA ports for Model 3100 Switch Cards. Refer to Table 3-1, on the next page for connector descriptions.

Note: COMB ports are not used.

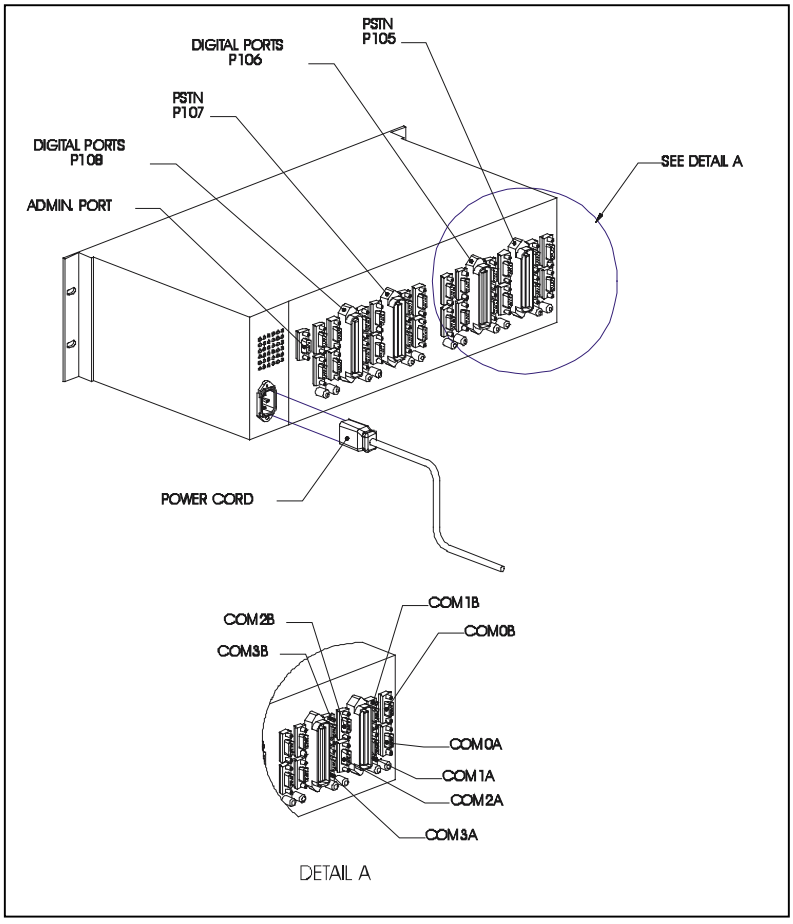


Figure 3. 1. Rack Backplane

Connector ID/Label	Description	Label Placement
ADMIN PORT	RS-232, DB9 female connector used to interface with the Switch Management Interface, running on a PC.	
CARDs 0-11	Switch Card slots	At the top of the backplane, above the connector pins.
DIGITAL PORTS P106	50-pin male connector from DEFINITY ECS Digital ports to Switch Cards in slots 0-5 (Table 3-2 is pinouts)	At the top of the 50 pin connector.
PSTN P105	50-pin male connector from PSTN to Switch Cards in slots 0-5 (Table 3-4 is pinouts)	At the top of the 50 pin connector
DIGITAL PORTS P108	50-pin male connector from DEFINITY ECS Digital ports to Switch Cards in slots 6-11 (Table 3-3 is pinouts)	At the top of the 50 pin connector
PSTN P107	50-pin male connector from PSTN to Switch Cards in slots 6-11 (Table 3-5 is pinouts)	At the top of the 50 pin connector
COMA ports 0-11	RS-232 DB9 female connector used for Data. Each Analog Switch Card is provided with one COM port.	Above connector. (Lower of two DB-9 connectors)
COMB ports 0-11	Not used at this time.	

Table 3-1. Backplane connectors defined

How to Secure the Rack to a Chassis

Introduction The following procedure explains the steps necessary to secure the Rack to an existing chassis.

Procedure

1. Position the Model 3000 Rack so the mounting “ears” of the Rack frame are aligned with the mounting holes of the chassis. (see Figure 3.2 below)

2. Secure the Rack with mounting hardware (4 screws) provided.

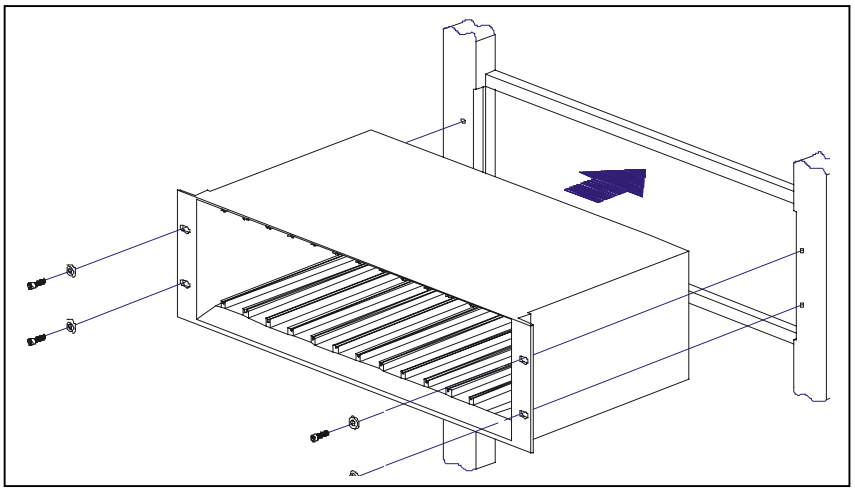


Figure 3.2. Rack Mounting

How to Wire the Rack to the PSTN and DEFINITY ECS

Introduction

The following procedure provides wiring information to connect the mounted Rack via the backplane connectors to the PSTN and to the digital ports on the DEFINITY ECS. (see Tables 3-2, 3-3, 3-4 and 3-5 for pinouts and wiring details)

Definitions

Twisted Pair: Two insulated copper wires twisted around each other to reduce interference with other electrical sources. Numbers refer to pin numbers on the 50 pin female connector.

Tip wire: The negative conductor in a telephone cable pair.

Ring wire: The positive conductor in a telephone cable pair.

Port 1, Port 2: Connections from Switch Cards to DEFINITY ECS digital port.

Port 1 is used for Model 3100 and 3200 Switch Cards.
Port 2 is used for Model 3200 ISDN Switch Cards only

Card: Identifies the Switch Cards in the Rack
(0 through 11)

Procedure

1. Wire the Rack to the DEFINITY ECS using two 50-pin female connectors. Use the tables provided in this Chapter for specific twisted pair connections:
   - P106, (Cards 0-5) Table 3-2
   - P108, (Cards 6-11) Table 3-3

2. Wire the Rack to the PSTN using two 50-pin female connectors. Use the tables provided in this Chapter for specific twisted pair connections:
   - P105, (Cards 0-5) Table 3-4
   - P107, (Cards 6-11) Table 3-5

Connections from DEFINITY ECS Digital port to Rack (Cards 0-5)

Twisted Pair	Rack Termination			Twisted Pair	Rack Termination		
	Wire	Port	Card		Wire	Port	Card
1	Tip	1	0	13	Tip	1	3
26	Ring	1	0	38	Ring	1	3
2	*Tip*	*2*	*0*	*14*	*Tip*	*2*	*3*
27	*Ring*	*2*	*0*	*39*	*Ring*	*2*	*3*
5	Tip	1	1	17	Tip	1	4
30	Ring	1	1	42	Ring	1	4
6	*Tip*	*2*	*1*	*18*	*Tip*	*2*	*4*
31	*Ring*	*2*	*1*	*43*	*Ring*	*2*	*4*
9	Tip	1	2	21	Tip	1	5
34	Ring	1	2	46	Ring	1	5
10	*Tip*	*2*	*2*	*22*	*Tip*	*2*	*5*
35	*Ring*	*2*	*2*	*47*	*Ring*	*2*	*5*

Table 3-2. Connector P106

Note: Italics represent connections for Model 3200 Switch Cards (ISDN).

Connections from DEFINITY ECS Digital port to Rack (Cards 6-11)

Twisted Pair	Rack Termination			Twisted Pair	Rack Termination		
	Wire	Port	Card		Wire	Port	Card
1	Tip	1	6	13	Tip	1	9
26	Ring	1	6	38	Ring	1	9
2	*Tip*	*2*	*6*	*14*	*Tip*	*2*	*9*
27	*Ring*	*2*	*6*	*39*	*Ring*	*2*	*9*
5	Tip	1	7	17	Tip	1	10
30	Ring	1	7	42	Ring	1	10
6	*Tip*	*2*	*7*	*18*	*Tip*	*2*	*10*
31	*Ring*	*2*	*7*	*43*	*Ring*	*2*	*10*
9	Tip	1	8	21	Tip	1	11
34	Ring	1	8	46	Ring	1	11
10	*Tip*	*2*	*8*	*22*	*Tip*	*2*	*11*
35	*Ring*	*2*	*8*	*47*	*Ring*	*2*	*11*

Table 3-3. Connector P108

Note: Italics represent connections for Model 3200 Switch Cards (ISDN).

Connections from PSTN to backplane (Cards 0-5)

Twisted Pair	Rack Termination		Twisted Pair	Rack Termination	
	Wire	Card		Wire	Card
1	Tip	0	13	Tip	3
26	Ring	0	38	Ring	3
5	Tip	1	17	Tip	4
30	Ring	1	42	Ring	4
9	Tip	2	21	Tip	5
34	Ring	2	46	Ring	5

Table 3-4. Connector P105

Connections from PSTN to backplane (Cards 6-11)

Twisted Pair	Rack Termination		Twisted Pair	Rack Termination	
	Wire	Card		Wire	Card
1	Tip	6	13	Tip	9
26	Ring	6	38	Ring	9
5	Tip	7	17	Tip	10
30	Ring	7	42	Ring	10
9	Tip	8	21	Tip	11
34	Ring	8	46	Ring	11

Table 3-5. Connector P107

How to Connect the Cards to the Data Network

Introduction Analog Switch Cards installed in the Rack can be connected to the corporate Local Area Network (LAN) via a Remote Access Server (RAS) or Terminal Server.

Model 3100 Analog Switch Cards

A standard RS-232 DB9 male connector plugs into the appropriate COMA on the Rack backplane. Each Switch Card acts as a Data Connect Equipment (DCE) device. When a remote module connects to a Switch Card, the pair extends the RS-232 port to the remote location.

Note: The connections are shown in Figure 3.3, on the next page. (see Table 3-6 in this Chapter, for more detailed information about RS-232 DB-9 pinouts)

Model 3200 ISDN Switch Cards

Model 3200 Switch Cards do not accommodate data connections. Remote users must dial-in directly to the RAS or Terminal Server.

How to connect the Cards to the Data Network

continued

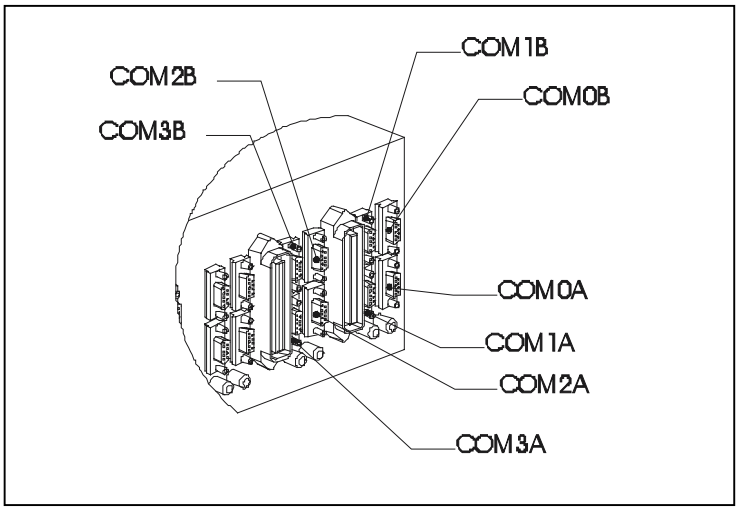


Figure 3.3. Data Port connectors (on the Rack Backplane)

Remote PC Connectivity

- Connect your Personal Computer (COM port) or data terminal to the RS-232 port on the remote module.
- A 9-pin straight-through cable will work for many Personal Computers. An adapter is needed if the PC does not have a 9-pin connector.

NOTE: The RS-232 cable length must not exceed 50 feet.

PC COM port settings

Before data connectivity is operational, you must make sure that the data settings on the Switch Card, remote module, remote PC, and RAS or Terminal Server all match.

RS-232 DB-9 Connector Pinouts

Introduction Table 3-6, shown below, lists each pin within the RS-232 connector with the signal description and direction of data flow.

PIN	EIA DESIG	DESCRIPTION	DIRECTION
1	RLSD	Received Line Signal Detector	Output
2	RD	Received Data at DTE	Output
3	SD	Transmitted Data from DTE	Input
4	DTR	DTE Ready	Input
5	SG	Signal Ground	Common
6	DSR	DCE Ready	Output
7	RTS	Request to Send	Input
8	CTS	Clear to Send	Output
9	RI	No Connection	NA

Table 3-6. RS-232 Cable Pinouts

RS-232 Terminology

EIA: Electronics Industry Association

DTE: Data Terminal Equipment

DCE: Data Communications Equipment.

Note: The interface is specified by EIA/TIA 574. The term RS-232 refers to the older 25-pin specification. RS-232 is used in this manual because of the common use of the term for serial interfaces.

Before you Power Up the Rack

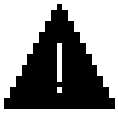
Introduction

This procedure details the necessary steps to perform BEFORE bringing the loaded Rack online.

Rack Checklist

- ❑ The Rack is secured properly in a protected chassis.
- ❑ The power cord is connected.
- ❑ Rack position “Card 0” contains the latest Switch Card.
- ❑ The appropriate 50-pin female connectors are connected to the Rack backplane and wired to the DEFINITY ECS and PSTN.

Safety Checklist



IMPORTANT SAFETY INSTRUCTIONS

- ❑ Do not install this product near water, for example, in a wet basement location.
- ❑ Do not overload wall outlets, as this can result in the risk of fire or electrical shock.
- ❑ Do not attach the power supply cord to building surfaces. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
- ❑ Do not operate the system if chemical gas leakage is suspected in the area. Use telephones located in some other safe area to report the trouble.

Power Up

If the above checklist is OK, plug the Rack into the AC outlet.

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Installing Switch Cards

4

Chapter Contents

4. Installing Switch Cards

Introduction

This chapter explains the steps necessary to quickly install and configure new Switch Cards in the Rack.

Important Information

- When setting up the Rack for the first time, place the first Switch Card (Model 3100 or 3200) in Rack position labeled Card 0. (This is the slot furthest from the power supply)

  Note: This is required for the Rack to communicate with the Switch Management Interface software on your PC.

- Subsequent Switch Cards may be placed anywhere in the Rack. (Slots 1 to 11)

- Switch Cards can be "hot-swapped" as necessary for replacement or upgrading. This means that cards can be added or removed without powering down the entire Rack. This also allows other cards within the Rack to remain on-line.

- To "hot-swap" a Card that is currently in use, use the Make Busy feature. The Make Busy feature prevents dropping calls by monitoring line status. When the remote user ends a call, the Switch Management Interface automatically takes the card offline so it cannot connect again. The Switch Card can then be safely removed if necessary.

DIP Switch Settings

Each Model 3100 Switch Card is equipped with a four position DIP switch; all switches should remain in the OFF position. The Model 3200 Switch Cards do not have DIP switches.

Note: The Switch Card will not function properly if any DIP switch is turned ON.

How to Install Switch Cards in the Rack

Procedure

1. Carefully slide the card into the chosen slot in the Rack. (see Figure 4.1)

Note: Component side of the card (the side where the LED is mounted) should face the power supply of the Rack.

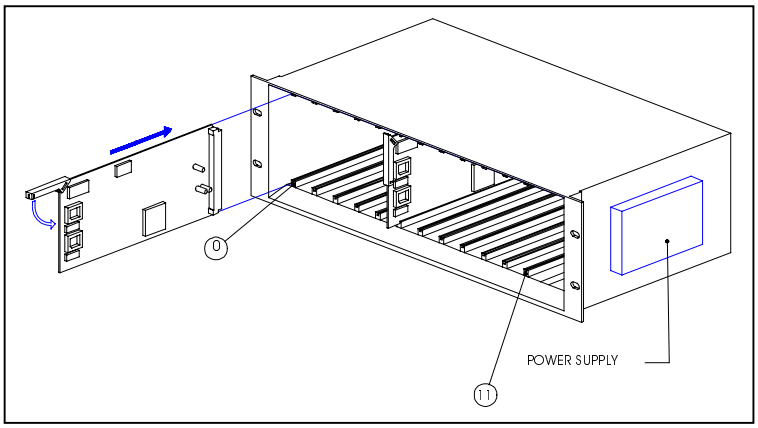

Figure 4.1. Sliding the Switch Card in the Rack.

2. Push the card until it is completely seated in the connector.

3. Configure and update the new card. (see page 5-13)

4. Change the administrator password through the Switch Management Interface or Terminal Emulation. (see page 5-15)

Recommendations for Switch Card installation

- Install either a Model 3100 or Model 3200 card in Slot 0. This Card should contain the latest software.
- If using both Model 3100 and Model 3200 cards on the same Rack, the 3200 Switch Cards should be installed in Slots 0-5 and 3100 Switch Cards installed in Slots 6-11. This will make it easier to identify what type of card is installed, and easier for troubleshooting.
- Ideally, an Uninterruptible Power Supply (UPS) should be connected to the Rack. This will prevent Remote Users from not being able to connect, should there be a power failure.

Configuration

5

Chapter Contents

5. Configuration

Introduction

This chapter provides information for configuring Switch Cards to communicate with the appropriate remote modules. The Switch Management Interface or a PC running a terminal emulation program can be used to configure cards.

System Administrator

The system administrator has complete control of the entire Rack. Only the system administrator should have access to the Switch Management Interface.

To set up the Rack:

1. Create a user and assign a password for each remote module.
2. Create user groups to designate users by job function or department. The User ID consists of the first two digits of the password. These are automatically assigned when users are added to user groups.
3. Upload user group information to single or multiple Switch Cards. See next page for configuration steps.

Password Files

All user and user group information is stored in password files. To setup and configure the Switch Cards, you MUST create at least one password file. Password files are saved to and retrieved from the hard disk of your PC. Cards cannot be configured without first opening a password file. See page 5-11 for more information.

Additional tasks

The Switch Management Interface allows the system administrator to perform these additional tasks:

- Detect existing hardware within the Rack (page 5-13)
- Display card position, model, and user group assignments (page 5-13)
- Configure the Model 3100 Card data port settings (page 5-28)
- Configure the Model 3200 ISDN parameters (page 5-31)
- Display card statistics (see page 6-27 in Chapter 6)
- Review card status (see page 6-19 Chapter 6)
- Troubleshoot connection problems (see Chapter 6)
- Upgrade card software (see Chapter 7)

Configuration Steps

To configure the Rack and Switch Cards using the Switch Management Interface:

1. Install the Switch Management Interface on the PC. (see page 5-6 for more information) Connect the PC to the ADMIN Port (P110) of the Rack.

2. Run the Switch Management Interface and open or create a password file.

   Note: A password file must be open to connect to the Rack. (see page 5-11 or page 5-12 for more information)

3. Configure the ISDN parameters (Model 3200 Switch Cards only) (page 5-31 for more information)

4. Once a password file is opened or created, the Switch Management Interface will automatically try to connect to the Rack. If successful, all installed Switch Cards display under the **Hardware** tab.

   *Note: If the Switch Cards do not appear, check the COM port settings under the **Settings** icon. (see page 5-30 for more information)*

5. Change the administrator password from the default (000000), (page 5-15).

6. Add users by selecting the **Users** tab. For tighter security, create a separate user for each remote module. Assign passwords to users manually or allow the Switch Management Interface to randomly create them. See page 5-19 for more information.

7. Assign users to a User Group. Select the **User Groups** tab and create User Groups for the password file. Add users to each User Group as desired. If only one user connects to each Switch Card, each User Group may have only a single user. If all users can use all cards, create one large User Group and download it to every card. (see page 5-20 for more information)

Configuration Steps *continued*

8. Assign User Groups to Switch Cards. Select the **Hardware** tab on the left and then the **Passwords** tab in the center of the screen. Assign User Groups to cards. (see page 5-24 for more information)

9. Upload the User Groups to Switch Cards. This can be done individually, but it may be easier to do all the cards at once. Click on the **Passwords** icon and follow the instructions. (see page 5-26 for more information)

   *Note: Once the passwords are uploaded, always **Save** and **Print** the passwords for future reference. Keep the printed list in a secure location away from the Rack.*

10. Set the Switch Card Data Port (Model 3100 Cards only). (see page 5-28 for more information)

11. Make sure the Remote Module is configured. See steps below for information.

How to Configure the Remote Module

Model 1101 Remote Module
Must be configured with the PBX dial phone number (i.e. the phone number of the PSTN line connected to the Switch Card). To use the COD or Dialback features, program the Remote (REM) phone number along with the appropriate COD or Dialback options.

Model 2101 Remote Module
Must be configured with the ISDN parameters (i.e.the Network Switch Type, Service Profile Identifiers (SPID) numbers, Directory Numbers (DN), and the TEI type). To use the COD or Dialback features, program the REM phone number along with the appropriate COD or Dialback options.

Note: See the Remote Module User's Manuals for details on configuring the Remote Module.

Configuration Using the SMI

How to Connect to the ADMIN Port

Introduction

The ADMIN port provides a direct connection to all features and functions of the Switch Management Interface (SMI) and the ability to configure, monitor and troubleshoot all Switch Cards in the Rack.

Required cable

A standard RS-232 serial straight-through (DB-9, Male) cable is required. Use this cable to connect the PC's COM port to the ADMIN Port (P110) on the back of the Rack. (see Figure 5.1 below)

IMPORTANT: RS-232 cable length should not exceed 50 ft.

Note: This connection must be used in conjunction with the Switch Management Interface.

Using the Switch Management Interface

Before using the Switch Management Interface, you must first do the following:

- ❑ install the Switch Management Interface (next page)
- ❑ confirm that the Switch Management Interface settings match your PC's COM port settings. (see page 5-30)

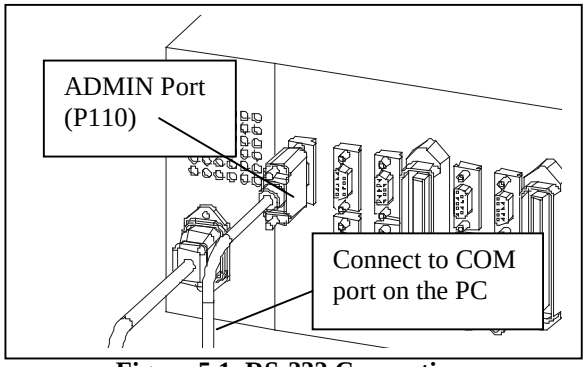

Figure 5.1. RS-232 Connection

How to Install the Switch Management Interface

Note: The Switch Management Interface software must be installed before the ADMIN port can be used to configure Switch Cards.

The Switch Management Interface is compatible with Windows 95, Windows 98, and Windows NT 4.0. The software is provided on two floppy disks. Installation uses the standard Windows install wizard to create a Switch Management Interface program group in Windows.

Procedure

Important: *Close all open applications before installing.*

1. Insert Disk 1 of 2 into the floppy drive.

2. Click **Start: Run**.

3. Enter the program setup file: a:\setup.exe. Click **OK**. (see Figure 5.2 below)

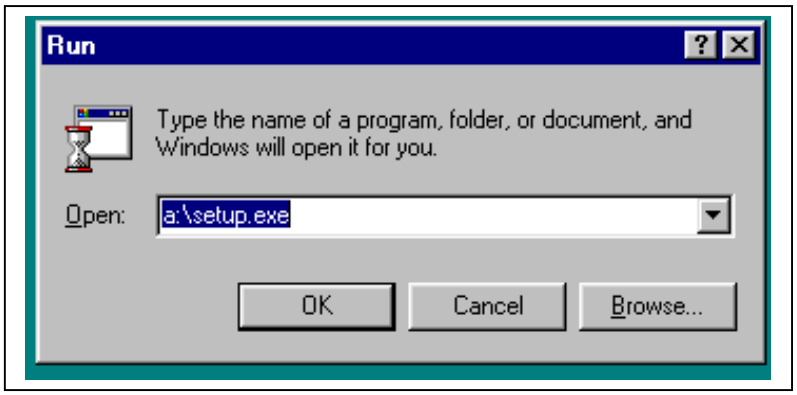

Figure 5.2. Select floppy drive

4. The Switch Management Interface setup prepares the install wizard for installation.

How to Install the Switch Management Interface
continued

5. The welcome screen appears, click **Next.** (see Figure 5.3 below)

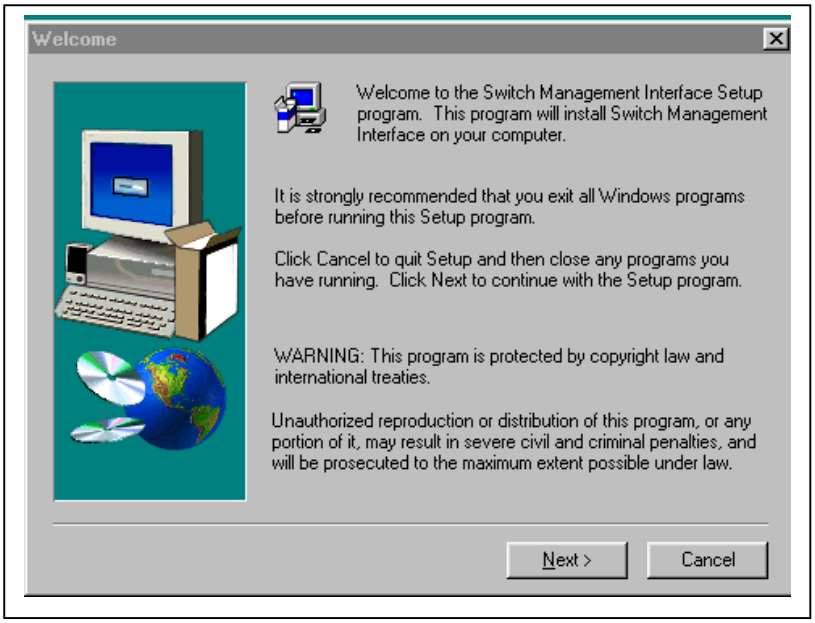

Figure 5.3. Welcome screen

How to Install the Switch Management Interface
continued

6. Click **Next** at each of the next two screens.

Note: The computer will automatically load the program.

7. The setup program will ask for Disk 2 of 2. Insert Disk 2 into the floppy drive, click **OK**.

8. Setup will complete the installation. Click **Finish**.

*Note: The program will ask if you want to restart the PC. Click **Yes** to restart it now, or **No** to restart it later.*

9. Remove Disk 2 from the floppy drive.

How to Start the Switch Management Interface

Procedure

1. Once the Switch Management Interface has been properly installed, and the PC restarted, click **Start/Programs**.

2. Locate the **Lucent Technologies** program group folder and select **Switch Management Interface**.

3. The following **Startup** screen appears. (see Figure 5.4 below)

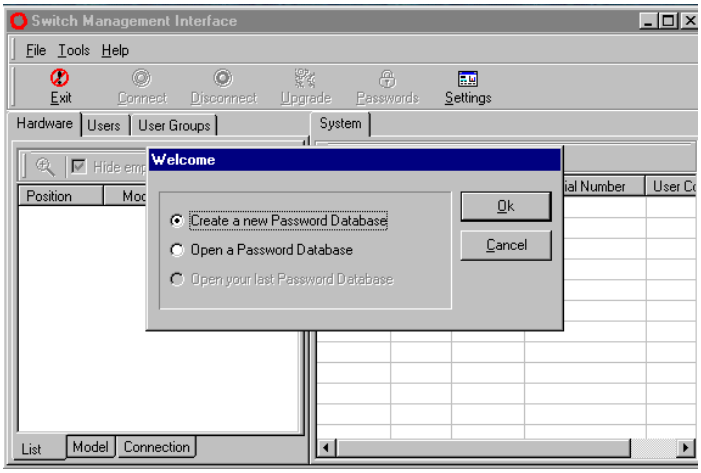

Figure 5.4. Startup screen

4. A password file must be opened. Follow the procedure on the next page for password file options.

Password File Options

Introduction Once the Switch Management Interface has been opened, a **Welcome** menu will appear. This menu provides the system administrator with three password file options.

Note: If you have already created a password file, all three options will be selectable. If this is the first time opening the Switch Management Interface, the last choice will be shadowed and therefore not selectable.

Select from one of the following three options, and click **Ok.**

- Create new Password Database.
  This selection will create a new password file. Select this option if this is the first time you have opened the Switch Management Interface.

- Open a Password Database.
  This selection will open an existing password file.

- Open your last Password Database.
  This selection will open the last previously used password file.

  Note: The last selection will be dimmed if it is the first installation or when the Switch Management Interface cannot locate a previously used password file.

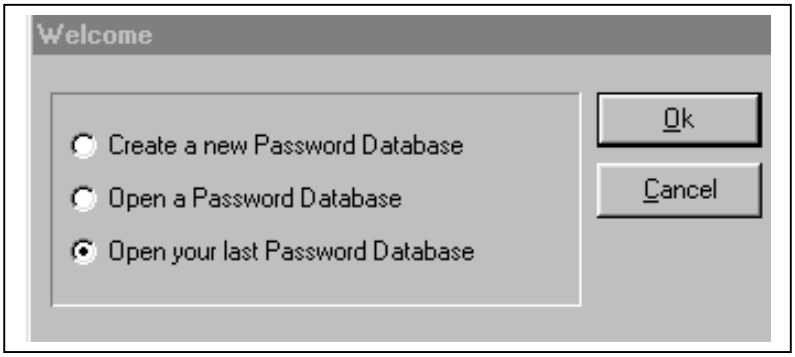

Figure 5.5. Options menu

How to Open a User Password File

Introduction The Switch Management Interface stores user, user group, and password information for the Rack in a user password file.

Example: test1.pwd

Note: For the initial setup of the Rack a "New" password file must be created before any User information can be entered, or status information can be displayed.
(see page 5-12 for more information)

Procedure To connect to the Rack and configure Switch Cards:

1. Select **Open a Password Database** from the Options menu, (see Figure 5.5).

2. Locate the database file (see Figure 5.6, on the next page)

3. Click **Open**. You will be automatically connected to the Rack.

Message reads:

Status: Please wait while detecting hardware……

Note: The Switch Management Interface will automatically detect Switch Cards installed in the Rack. If the hardware is not detected, go to Chapter 6 for troubleshooting steps.

How to Create a User Password File

Procedure To connect to the Rack and configure Switch Cards:

1. Select **Create a new Password Database** from the Options menu (see Figure 5.5 on page 5-10). Type in a name for the new password file or the system will automatically assign the new name as “default” (see Figure 5.6 below).

2. Click **Open**. You will be automatically connected to the Rack.

Message reads:

Status: Please wait while detecting hardware……

Note: The Switch Management Interface will automatically detect Switch Cards installed in the Rack. If the hardware is not detected, go to Chapter 6 for troubleshooting steps.

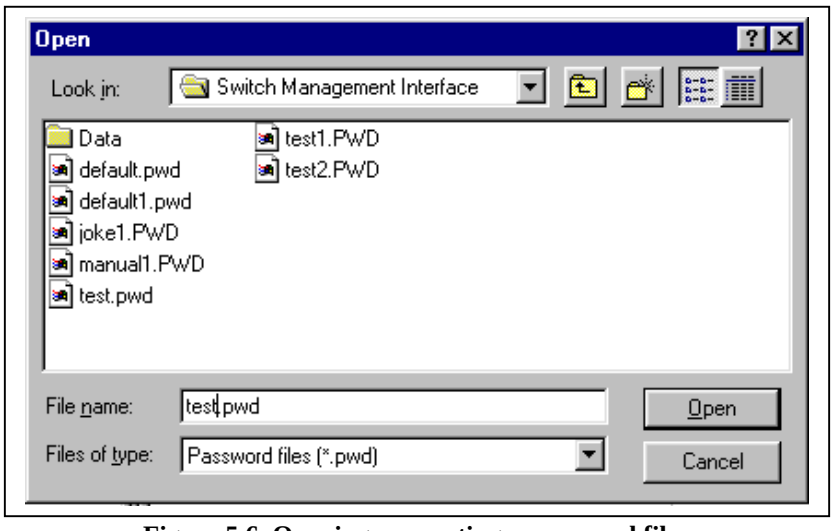

Figure 5.6. Opening or creating a password file

Initial Card Detection

Introduction Once a password file has been created or opened, the software automatically connects to the Rack and detects the Switch Cards that are installed.

Note: If the Switch Cards are not being detected, check your PC COM port, RS-232 cable, and communication settings within the Switch Management Interface. (see page 5-30)

Displaying Information To view information for a specific card, click on the card shown under the **Hardware** tab (see Figure 5.7 below).

***Important**: For displaying cards that have been recently added or "Hot swapped", click **Update**.*

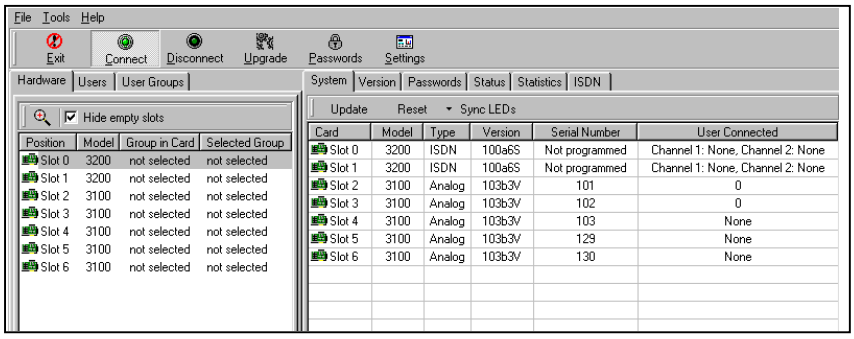

Figure 5.7. Initial card detection screen

Initial Card Detection continued

If this is the first card you have accessed since opening the Switch Management Interface, the following screen will appear.

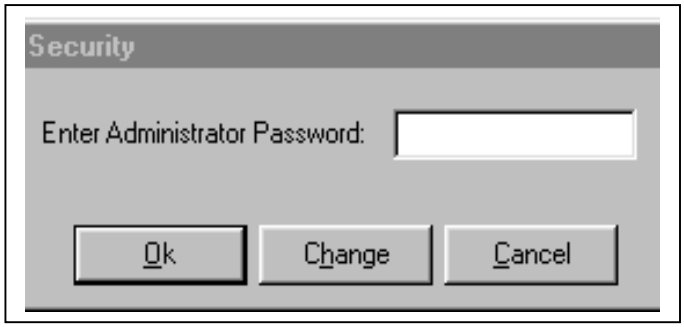

Figure 5.8. Administrator password screen

IMPORTANT: *You must enter the administrator password to proceed. Default password is 000000. Once you enter the administrator password you will have complete access to all Switch Cards in the Rack. You should change it immediately otherwise remote users will be able to connect to the system using the default administrator password.*

Note:

- *To change the administrator password see next page.*
- *To reset a forgotten administrator password see page 6-33, in Chapter 6 for more information.*

How to Change the Administrator Password

How the administrator password works

The administrator password not only provides access to all Switch Cards from the Switch Management Interface, it also provides an Access Code to allow a remote user to connect. This is why it is very important to change the administrator password from its default of 000000. When you add users to user groups, user IDs are automatically assigned from 01-99. User ID 00 is always reserved for the administrator. Therefore, to connect to a Switch Card from a remote module, you could simply enter 00000000 (user ID plus default password) unless the password has been changed.

Administrator Password Guidelines

When you change the administrator password, it changes the password for user ID 00 on ALL cards that are currently in the rack. In the future if you add additional Switch Cards, you should once again change the administrator password. This will remove the default password from the new Switch Card as it saves the new administrator password to all cards.

Note: When you change the administrator password, you should write it down and save it in a safe place. If you forget or lose the password, see page 6-42, in Chapter 6 for instructions on resetting the password back to the default 000000.

Security Alert:

Passwords should be hard to guess and therefore should not contain:

- all the same numbers (for example, 88888888)
- sequential numbers (for example, 987654321)
- number strings associated with you or with the remote user or with your business. These include:
  - Birthdays
  - Telephone numbers
  - Social security numbers
- Passwords should be changed regularly, at least on a quarterly basis. Do not recycle old passwords.

How to Change the Administrator Password continued

Procedure

*Note: The administrator password can also be changed by selecting the **Tools** menu and choosing **Change Password**.*

1. Whenever you are prompted to enter the administrator, you can click **Change**. The following dialog box appears:

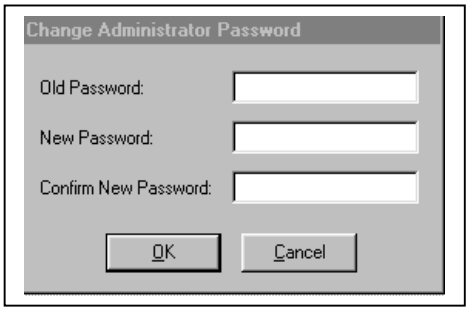

Figure 5.9. Change administrator password

2. Enter the **Old Password** (default password is **000000**).

Note: If you have forgotten the administrator password, see page 6-42, in Chapter 6.

3. Enter the **New Password** and **Confirm New Password.** Click **OK.** The following dialog box appears:

Figure 5.10. Password confirmation

4. Click **OK** .

5. Make sure to write down the new password and store it in a safe place.

User Access Code Overview

Introduction

The Switch Management Interface allows the system administrator to manage password information and user configurations for the entire Rack, using a single ADMIN port.

Reference

- Each user entry in the password database contains the first and last names of the user as well as the user's password. (see page 5-19 for more information)
- Users are assigned to user groups in order for them to be uploaded to switch cards. When users are assigned to the user group, they are automatically assigned a unique user ID (01-99)
- As user information in the database is modified, changes will be reflected in all user groups that refer to that entry.

Note: To create a User Password File, see instructions on page 5-12.

User

A user is considered to be any person that has permission to initiate a call from a remote module through a Switch Card.

Example: First name: Peter
Last name: Adams

User ID

User IDs are automatically assigned to users as they are entered into user groups. Each user in a user group will have a unique user ID. The user ID is always the first two digits of the remote user's access code. It is possible that a user could have multiple user IDs if they belong to several user groups.

Note: Adding a user to multiple user groups is NOT recommended as it may confuse users.

Remote Change Digit

This digit indicates whether a remote user is allowed to change their password when online with a Switch Card. It is the 3rd digit of the remote user access code and is present right after the user ID with this product. It is always assigned "9" to prevent users from changing their password.

User Access Code Overview *continued*

Password — Sequence of digits assigned by the administrator or randomly generated by the Switch Management Interface, assigned to a specific user which must be entered at the remote site to gain access to the DEFINITY ECS.

Remote User Access Code — When a remote user attempts to "Go online", they are prompted for a password after the remote module connects. They must enter their complete access code which consists of their User ID, followed by a "9" (the remote change digit), followed by their actual password.

Example (see Figure 5.11 below) — For Peter Adams to access the DEFINITY ECS from his remote module, he must enter the following access code:
Access Code: 0194333603

01 is the user ID assigned by the software
9 is the remote change digit
4333603 is the user password assigned by the administrator

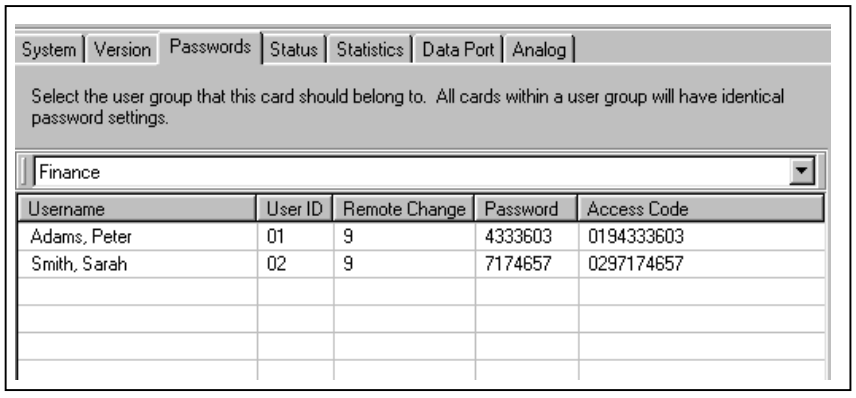

Figure 5.11. Access codes

How to Add/Remove Users

User Password guidelines

- Up to 100 passwords can be programmed into each Switch Card.
- Passwords are retained in non-volatile memory inside the Switch Cards
- All user access codes must contain 8 to 10 digits, including user ID and remote change digit.
- The 00 user ID is reserved for the administrator.

Adding Users

1. Click **Users** tab.

2. Click '**+ Add'.**

3. Double click on the "first" and "last" name fields, and enter user's information.

4. Assign a password, or click **Random** to allow the Switch Management Interface to generate a random password for the user.

5. Click **Apply.**

Note: To add additional users repeat steps 2 thru 5.

6. Click **File** and then **Save** to save the info to the password file.

Deleting Users

1. Select the user you wish to delete from the password file and click **' - Delete'** to clear entry.

2. Confirm the delete by clicking **Yes .**

3. Click **File** and then **Save** to save the info to the password file.

IMPORTANT NOTE*: Creating users does not load them into the Switch Cards. Users must be assigned to user groups, (see page 5-22) and user groups uploaded to Switch Cards. (see page 5-26)*

How to Create/Delete User Groups

Introduction

A user group is a logical list of users stored in a password file (.pwd). The administrator can add, remove and modify the user groups. In addition, the administrator can add, remove, or modify users within a user group.

Once users are assigned to user groups, user IDs are automatically created by the system. Every user group has user ID's 01-99 available. To view which user ID has been assigned to which user, click the **Hardware** tab on the left and then select the **Passwords** tab in the center of the screen.

Procedure

1. Click **User Groups** tab, the left portion of the screen displays the user groups in the database.

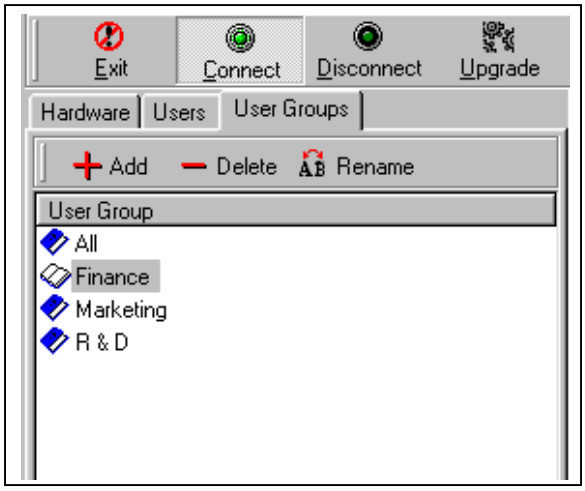

Figure 5.12. User group list

How to Create/Delete User Groups *continued*

2. To create a user group, click the **'+ Add'** tab just above the user group listing. Assign a name for the user group and click **OK**.

Figure 5.13. Assign a user group name

OR

3. To delete a user group, select the user group and click the **'- Delete**' tab just above the user group listing. Confirm the delete by clicking **Yes .**

Note: A deleted user group cannot be recovered.

OR

4. To rename a user group, select the user group and click the **'Rename**' tab just above the user group listing. Type over the existing name and press **Enter**.

How to Add/Remove Users from User Groups

Procedure

1. Click the **User Group** tab. The screen displays the database of user groups on the left side, and the right side will list all the available users.

2. Click the **User Group** to be modified.

3. Add or remove users to or from the list on the right side of the screen. (see Figure 5.14 below)

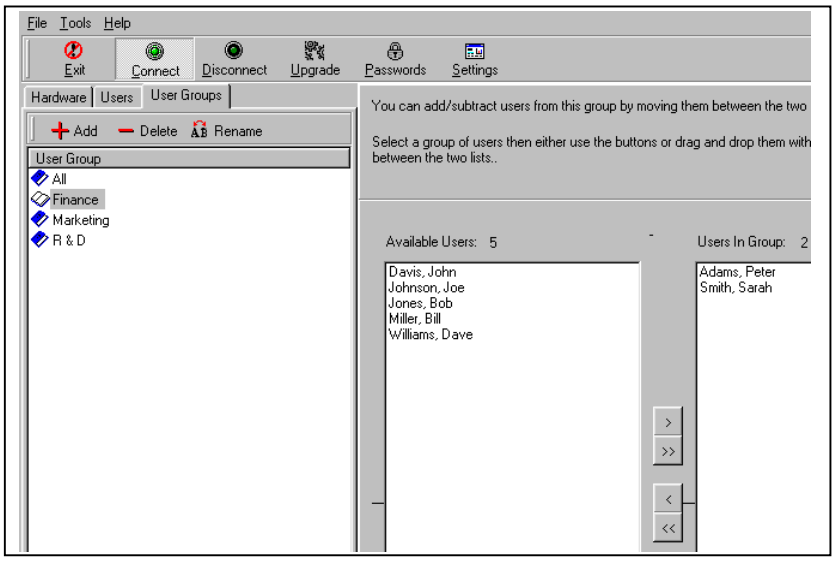

Figure 5.14. Add/Remove users from user groups

How to Add/Remove Users from User Groups
continued

Available commands:

Adding Users
Click '>' to add selected users to a user group
Click '>>' to add all users in the database to a user group

Removing Users
Click '<' to remove selected users from a user group
Click '<<' to remove all users from a user group

4. Click **File: Save** to save the information to the password file.

*Note: You can use **Shift + click** or **Ctrl + click** to select multiple users to add to a user group at one time.*

How to Assign User Groups to Cards

Introduction In order for a Switch Card to use passwords from a particular user group, that user group must be assigned and uploaded to that Switch Card.

Procedure

1. Click **Hardware** tab and select the desired card.

2. If not already logged in, enter the administrator password. (default password is 000000) Click **OK**.

Note: To change the administrator password, see page 5-15.

3. Click the **Passwords** tab (see Figure 5.15) on the right side of the screen. Select the desired user group from the drop down list.

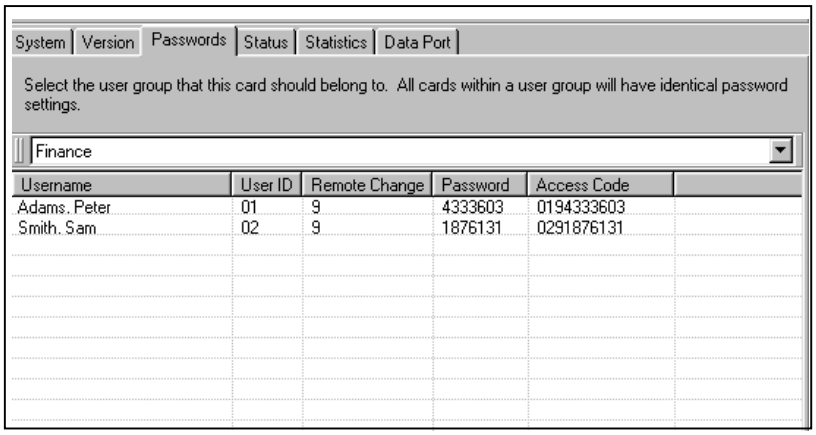

Figure 5.15. User Group information screen

Note: Any updated information will not be stored in the Switch Card until the passwords have been uploaded. (see page 5-26)

How to Assign User Groups to Cards *continued*

Setup tips

- Many organizations do not have more than 100 users sharing a single Rack. Therefore, it is common practice to set up a single user group, have all approved remote users belong to that user group, and upload the same user group to all Switch Cards.
- If each remote user can access one and only one specific Switch Card, you must set up a user group for each individual user, and upload these separate user groups to the specific Switch Cards.

How to Upload Passwords to Cards

Introduction Once the administrator has assigned a user group to each of the cards, they can be easily uploaded to cards in the Rack.

Procedure

1. Click the **Password** icon on top of screen to start the password wizard.

2. If not already logged in, enter the administrator password. (default password is 000000) Click **Next**.

Note: To change the administrator password, see page 5-15.

3. At default, all cards will be updated with the new password information. If only certain cards should be updated, deselect the **All compatible cards** check box, (see Figure 5.16 below) otherwise click **Next** and proceed to step 5.

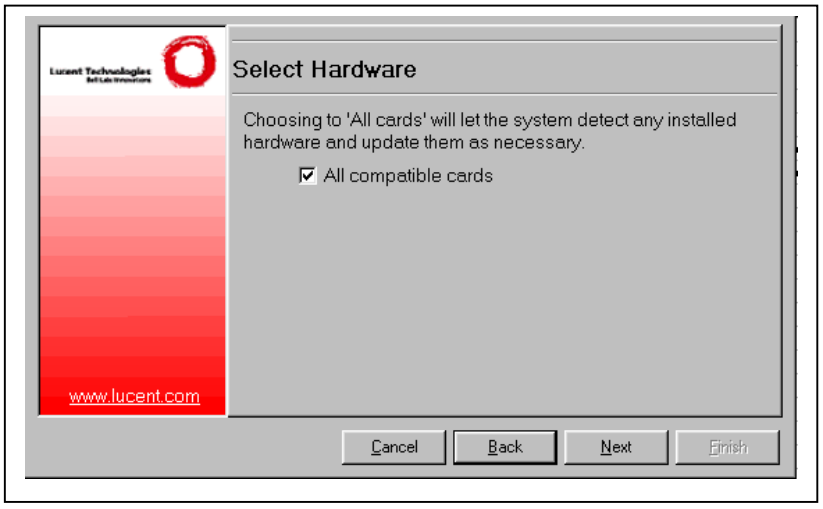

Figure 5.16. Select hardware

How to Upload Passwords to Cards continued

4. The list box will show all the cards in the Rack. Cards can be chosen selectively for individual update. Click **Next**.

*Note: If the Switch cards do not appear, click the **Detect** button.*

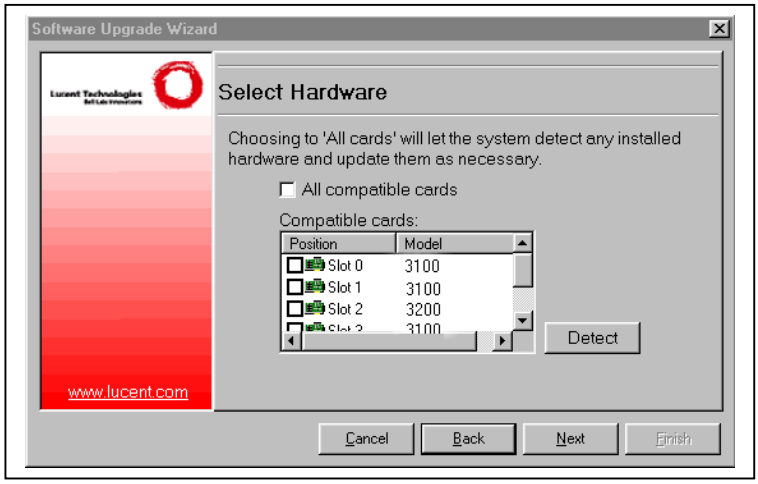

Figure 5.17. Card selection

5. The wizard then shows that it is ready to begin the update. Click **Next** to begin. The wizard will display the progress of the download.

6. At the end of the process save the changes and print the list of uploaded passwords. (keep the list in a secure place for future reference).

7. Click **Finish**.

Note: The passwords uploaded to the individual Switch Cards correspond to the user group selected for each card. (see page 5-24).

How to Set the Switch Card Data Port (Model 3100 only)

IMPORTANT: The following procedure only applies to Model 3100 Switch Cards. Data capabilities are not currently available for the Model 3200 Switch Cards.

Introduction If you are using the COM ports of the Switch Cards for simultaneous data access, the administrator can adjust the data port settings on any Switch Card. You must match the data port settings of the Switch Card to the remote module.

Procedure

1. Click **Hardware** tab and select the card to be setup.
2. Click **Data Port** tab.
3. Set the data port settings as needed. (see Figure 5.18 on the next page) The default settings are listed for reference.

BPS	38,400	**Parity**	None
Databits	8	**Stopbits**	1

Note: Confirm that the data settings on the Switch Card, remote module, remote PC, and RAS or Terminal Server all match. If you cannot get data connectivity after insuring that all data settings match, see Data Connection Problems*, page 6-36 in Chapter 6.*

How to Set the Switch Card Data Port *continued*

4. Click **Apply**.

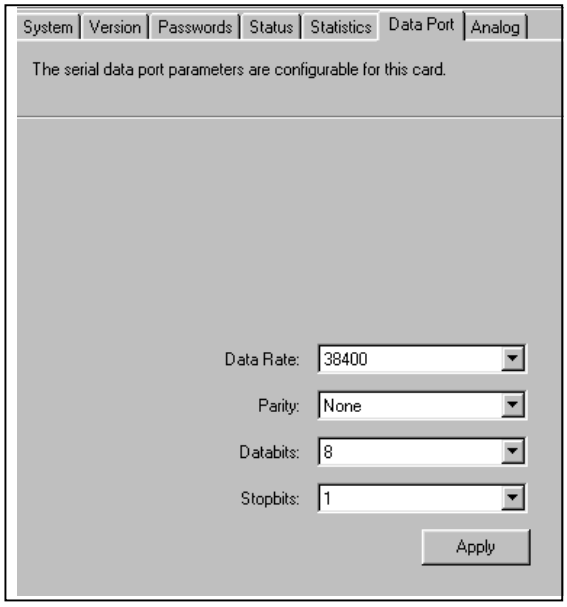

Figure 5.18. Data port settings

How to Configure the Switch Management Interface to the PC's COM Port

Introduction The ADMIN port, used by the Switch Management Interface, provides the physical connection from the Rack to the PC's COM port. The **Settings** icon, within the Switch Management Interface, is used to match the settings for the software with the appropriate COM port.

Procedure

1. Click **Settings** icon.

2. Set the connection settings to match the COM port of the PC running the Switch Management Interface. Click **OK**.

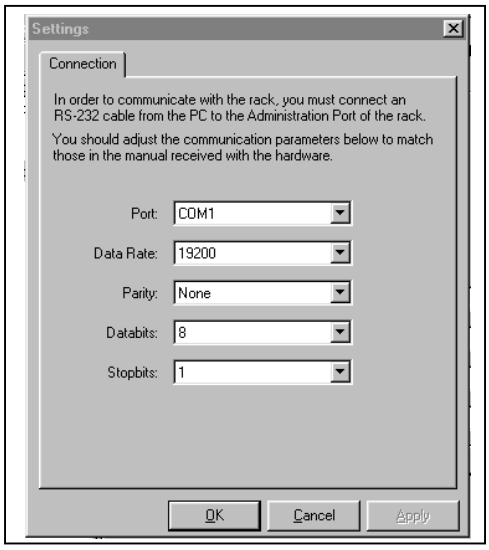

Figure 5.19. Settings Icon

How to Set ISDN Parameters (Model 3200 only)

Introduction To ensure that the Model 3200 Switch Cards communicate properly with the ISDN network, you must set the ISDN parameters.

Note: Please ensure that you get this information from your network provider

These parameters are:

- ISDN network Switch Type
- Two Service Profile Identifier (SPID) numbers (Channels 1 and 2)
- Two Directory Numbers (DNs) (Channels 1 and 2)
- Terminal Endpoint Identifier (TEI) (automatically setup)
- Connect Rate (automatically setup)

ISDN network Switch Type: The switch type informs the ISDN network what type of central office (CO) switch is being used.

SPIDs: A Service Profile Identifier (SPID) number is a unique identifier that associates a Basic Rate Interface (BRI) line with a particular User Service Order Profile (USOP). The USOP contains the information needed by the central office to provide BRI service to the line. The SPID can be up to 15 digits long and usually contains the digits of the Directory Number (DN) to which it is linked.

Example: 617555121100

In this example, “617” is the area code; “5551211” is the regular 7-digit dial number; and “00” is the network ID code. The network ID code can consist of two or 4-digits and is usually a combination of 0’s and 1’s.

.

How to Set ISDN Parameters *(Model 3200 only) continued*

DNs: The first Directory Number (DN) (Channel 1) on the Switch Card is the number the Remote Module dials to reach the DEFINITY ECS. The second Directory Number (Channel 2) can be used to connect to another Remote Module. The DN is usually seven to ten digits long and includes an area code if required to reach the Remote Module.

Example: 6175551211

In this example, “617” is the area code, “5551211” is the regular 7-digit dial number.

Procedure (see Figure 5.20 on the next page)

1. Select the **Switch Type** from the drop down list.
2. Type in the **SPID** and **DN** numbers for both Channels (1 and 2).
3. Click the box next to **Automatic TEI select.**
4. Set the **Connect Rate** to **Auto**.
5. Click **Apply**.

How to Set ISDN Parameters *(Model 3200 only) continued*

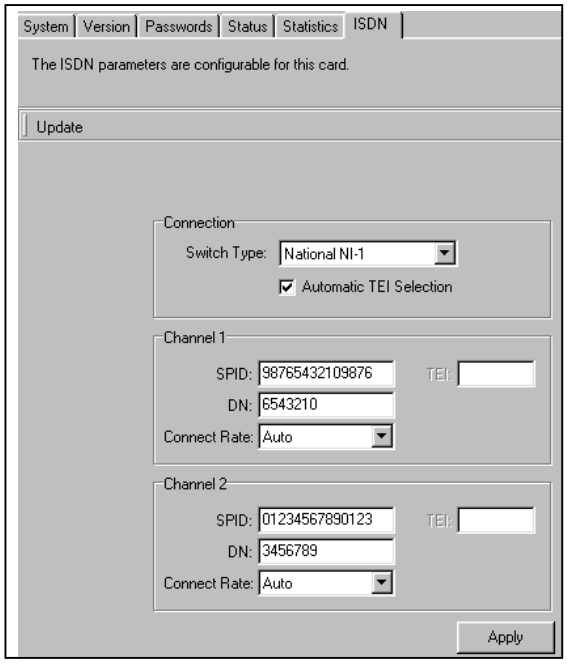

Figure 5.20. Setting ISDN parameters

Configuration using Terminal Emulation

Introduction The *Enhanced Terminal Interface* (ETI) provides a user-friendly interface to configure individual Switch Cards in the Rack. The ETI is accessed through the COM A port (lower connectors) on the Switch Card being configured. The ETI menu is the default menu that appears after powering up the card and operates using VT100 terminal emulation.

Note: The ADMIN port cannot be used with ETI. If using the ETI for the following procedures, the information will not be synchronized with the data saved within the Switch Management Interface. Therefore, we strongly recommend using the Switch Management Interface instead of a terminal emulation to manage the Switch Cards.

Procedure

1. Connect a PC to the COMA port of a Switch Card using an RS-232 straight-through serial cable.

2. Set up terminal emulation for 9.6 Kbps, NO parity, 8 data bits, 1 stop bit.

3. Remove the card from the Rack and re-insert it. Once the card has been re-inserted, the card will undergo hardware tests demonstrated by a series of green, yellow and red blinks.

   The Switch Card status LED will blink as follows; Red flashes, three green flashes, four yellow flashes, then three sets of eight yellow blinks.

4. During the first set of eight yellow blinks, type the word **MENU** from the terminal screen. The Configuration Menu should appear on the screen.

   - For Model 3200 Switch Cards see the next page for instructions.
   - For Model 3100 Switch Cards see page 5-45 for instructions.

5. The remote module must also be configured, see "*How to Configure the Remote Module*" on page 5-4.

How to Set ISDN Parameters (Model 3200 only)

Introduction To ensure that the Switch Module communicates properly with the ISDN network, you must set the ISDN parameters.

Note: Please ensure that you get this information from your network provider.

These parameters are:

- ISDN Network Switch Type
- Two Service Profile Identifier (SPID) numbers
- Two Directory Numbers (DNs)
- Terminal Endpoint Identifier (TEI)
- Connect Rate

Setting the ISDN Network Switch Type

Setting the switch type tells the ISDN network what type of central office (CO) switch is being used.

Procedure

1. Select **1** for *Configure ISDN* from the Main Menu on the terminal emulation program to reach the ISDN Parameter Menu.
2. Press **1** for *Set Switch Type* from the Configure ISDN Menu.
3. The screen shows the choices for the switch type.
4. Press the appropriate number to select the switch type.
5. The Configure ISDN Menu will appear automatically.
6. Continue setup on next page, or proceed to page 5-44 to save changes.

How to Set ISDN Parameters *(Model 3200 only) continued*

Setting the SPID Numbers

A Service Profile Identifier (SPID) number is a unique identifier that associates a Basic Rate Interface (BRI) line with a particular User Service Order Profile (USOP). The USOP contains the information needed by the central office to provide BRI service to the line.

The SPID can be up to 15 digits long and usually contains the digits of the Directory Number (DN) to which it is linked.

SPID1: 617555121100

In this example, “617” is the area code; “5551211” is the regular 7-digit directory number; and “00” is the network ID code. The network ID code can consist of two or 4-digits and is usually a combination of 0’s and 1’s.

How to set ISDN Parameters *(Model 3200 only) continued*

Setting the First SPID

SPID1 is for the first B-channel, which is used for the first DEFINITY telephone Channel 1.

Procedure

1. Select **1** for *Configure ISDN* from the Main Menu to view the ISDN Parameter Menu.

2. Select **2** for *Set SPID1* from the Configure ISDN Menu.

If a previous SPID1 number was stored, the display shows that number. If no SPID1 number was stored, the display is blank.

3. Enter the first SPID for the Switch Module, up to a maximum of 15 digits.

4. Press **ENTER** to accept the change.

5. Continue setup on next page, or proceed to page 5-44 to save changes.

You automatically return to the Configure ISDN Menu

How to set ISDN Parameters *(Model 3200 only)*

continued

Setting the Second SPID

The second SPID can be up to 15 digits long and usually contains the digits of the Directory Number (DN) to which it is linked.

SPID2: 617555121200

In this example, “617” is the area code, “5551212” is the regular 7-digit directory number, and “00” is the network ID code. The network ID code can consist of two or 4-digits and is usually a combination of 0s and 1s.

Procedure

1. Select **1** for *Configure ISDN* from the Main Menu to view the ISDN Parameter Menu.

2. Select **3** for *Set SPID2* from the Configure ISDN Menu.

If a previous SPID2 number was stored, the display shows that number. If no SPID2 number was stored, the display is blank.

3. Enter the second SPID for the Switch Module, up to a maximum of 15 digits.

4. Press **ENTER** to accept the change.

5. Continue setup on next page, or proceed to page 5-44 to save changes.

You automatically return to the Configure ISDN Menu.

How to set ISDN Parameters *(Model 3200 only) continued*

Setting the Directory Numbers

The first Directory Number (DN) on the Switch Card is the number that a Remote Module dials to reach the DEFINITY ECS. The first DN number is used for the DEFINITY ECS Digital port “Channel 1”. The second DN number is the number that another Remote Module would dial to connect to the second “B” channel of the ISDN Switch Card. This second DN number is used for the DEFINITY ECS Digital port “Channel 2”.

The DN is usually seven to ten digits long. Program the DN using seven digits, unless your ISDN service provider specifies otherwise.

DN1: 6175551211

In this example, “617” is the area code, “5551211” is the regular 7-digit directory number.

How to set ISDN Parameters *(Model 3200 only) continued*

Setting the First Directory Number

Note: The first DN should be paired with SPID1.

Procedure

1. Select **1** for *Configure ISDN* from the Main Menu to view the ISDN Parameter Menu.

2. Select **4** for *Set DN1* from the Configure ISDN Menu.

If a previous DN1 number was stored, the display shows that number. If no DN1 number was stored, the display is blank.

3. Enter the first DN for the Switch Module, up to 15 digits in length.

4. Press **ENTER** to accept the changes.

5. Continue setup on next page, or proceed to page 5-44 to save changes.

You automatically return to the Configure ISDN Menu .

How to set ISDN Parameters *(Model 3200 only) continued*

Setting the Second Directory Number

Note: The second DN should be paired with SPID2.

Procedure

1. Select **1** for *Configure ISDN* from the Main Menu to reach the ISDN Parameter Menu.

2. Select **5** for *Set DN2* from the Configure ISDN Menu.

If a previous DN2 number was stored, the display shows that number. If no DN2 number was stored, the display is blank.

3. Enter the second DN for the Switch Card, up to 15 digits in length.

4. Press **ENTER** to accept the change.

5. Continue setup on next page, or proceed to page 5-44 to save changes.

You automatically return to the Configure ISDN Menu .

How to set ISDN Parameters *(Model 3200 only) continued*

Setting the TEI

The Terminal Endpoint Identifier (TEI) tells the Central Office which communication device is communicating with it. How you set the TEI may depend on the ISDN switch type.

If you are an NI-1 user, or if your telephone company has not provided you with TEI parameters, leave the TEI setting on "AUTO". If your telephone company has given you TEI parameters, select "FIXED" as the TEI type.

Note: If you change the TEI setting, you must power down and then power up your module to properly use the equipment.

To select *AUTO* as the TEI setting:

1. If the screen shows *FIXED* press **6** to display *AUTO*.

2. The screen will show *AUTO*.

To select *FIXED* as the TEI setting:

Note: If you want to use a Fixed TEI setting, you must first power down and then power up the Switch Card to use the settings.

1. If the screen shows AUTO, press **6** to display FIXED.

2. Select **7** for *Set TEI1* from the Configure ISDN Menu.

3. Enter the first TEI number for the Switch Card (0–63).

4. Press **Enter** to save the number.

5. Select **8** for *Set TEI2* from the Configure ISDN Menu.

Continued on next page

How to set ISDN Parameters *(Model 3200 only) continued*

6. Enter the second TEI number for the Switch Card (0–63).
7. Press **ENTER** to save the number.
8. Continue setup on next page, or proceed to page 5-44 to save changes.

You automatically return to the Configure ISDN Menu.

Setting the Connect rate

Procedure

1. Select **Configure System** from the *Main Menu*.

   The *Configure System Menu* appears.

2. Select **3** for *Set ISDN Connect Rate* from the *Configure System Menu*, and press **ENTER**.

3. Choose from the following settings and press **ENTER**;

   - Select **1** for *Auto*
   - Select **2** for *56K*
   - Select **3** to *Exit* the menu

   Note: Selection 1 is recommended.

4. Select **5** to Exit the *Configure System Menu*.

How to Save ISDN Parameters

Introduction After setting the appropriate ISDN parameters it is important to save the changes. The parameters that have been set using the Configure Menu are retained in FLASH ROM (within the Switch Card).

Procedure

1. Exit the *Configure ISDN* Menu.
2. Type **Y** to save changes.

   Or

   Type **N** to discard the changes.

Configuration of the Rack

Setting Passwords

- Before a remote module user can communicate with the Switch Card, the administrator must program a password for the remote user. At default, all passwords are disabled, and only the administrator password of **00000000** is enabled.
- Up to 100 passwords can be programmed into each Switch Card. This allows a number of different users to access the Switch Card at different times. However, only one remote module user can be connected to an individual Switch Card at any one time.

Programming Passwords

Procedure

1. Select **Configure System** from the Main Menu.
2. The *Configure System Menu* appears.
3. Select **Password** from the *Configure System Menu*, and press **ENTER**.
4. The screen prompts for the administrator password.
5. Type the administrator password (the default is **00000000**) and press **ENTER**.

   The *Password Menu* is displayed.

Display a Password

Procedure

1. Select **Display Password** from the *Password Menu*, and press **ENTER**. The system prompts for the user's two-digit User ID.

2. Type the user's two-digit User ID, and press **ENTER**. The User ID and the password assigned is displayed.

Change passwords

Procedure

1. Select **Change Password** from the *Password Menu*, and press **ENTER**. The system prompts for the NEW password.

   Enter the new password (8 to 10 digits), beginning with the remote user's Access Code, and press **ENTER**. (see page 5-17, for more information)

2. Repeat for each password change.

How to disable passwords

Procedure

1. Select **Change Password** from the *Password Menu*, and press **ENTER**. The system prompts for the new password.

2. Enter the User ID of the user password to be disabled, restricting the user's access to the system. The user ID is the first two digits of the User password and is unique for every user.

3. Repeat steps 1 and 2 for each password to be disabled.

Configuring the COM Port Settings (Model 3100 only)

Introduction
This step describes how to program the COM port on each Switch Card for serial data communications.

Note: Serial data is currently not supported on the Model 3200 Switch Cards. There is no need to set the COM port values.

Select *COM Port Settings* from the Configure System Menu.

Note: Confirm that the data settings on the Switch Card, remote module, remote PC, and RAS or Terminal Server all match. If you cannot get data connectivity, after insuring that all data settings match, see Data Connection Problems in Chapter 6 for more information.

Setting Data Rate

1. Highlight the appropriate data rate. Data rate options are: 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, and 115.2 Kbps.
2. Press **Enter,** the Parity Menu appears.

Setting Parity

1. Highlight the desired Parity. The choices are:
   None, Even, Odd
2. Press **ENTER**
3. The *Data Bits Menu* appears.

Setting Data Bit

1. Highlight the desired Data Bit. Options are 8 or 7 data bits.
2. Press **ENTER**
3. The *Stop Bits Menu* appears.

Setting Stop Bits

1. Highlight the desired Stop Bit format. Options are 1 or 2 stop bits.
2. Press **ENTER**. The *System Menu* screen automatically returns.

Show Settings

1. Highlight Show Settings.
2. Press **ENTER**. All system settings display.
3. Press any key to return to the *System Menu*.

Troubleshooting

6

Chapter Contents

6. Troubleshooting

Introduction

This chapter provides information to locate and correct operational errors, communication errors, and functional problems with the Rack or individual Switch Cards.

This chapter is divided into three principal areas for troubleshooting:

1. baseline checklist (see page 6-3)
2. built-in diagnostics (see page 6-4)
3. specific functional problems. (see page 6-33)

Baseline Checklist

The baseline checklist is a list of simple checks for both the Remote Module and Switch Card. It should be used as a starting point when beginning the troubleshooting process. It covers the basic setup of both products.

Built-in diagnostics

The Switch Cards and Remote Modules are designed with built-in diagnostic capabilities that include:

- displaying specific connection problems on the digital phone connected to the Remote Module,
- status LEDs that blink in a specific sequence detailing the Card status,
- Status and Statistics menus within the Switch Management Interface detail user information, connection details, and DEFINITY ECS error codes.

Specific functional problems

Troubleshooting problems that can be functionally identified are provided with symptoms and actions. Functional problems are divided into the following categories:

- Audio problems
- Data connection problems
- COD/Dialback problems

Baseline Checklist

Introduction The baseline checklist checks basic product setup.

Remote Module
(The following steps are performed at the remote site).

- ❑ Verify that the programmed dial numbers are correct.
- ❑ Check all interconnecting cables to ensure they are properly seated.
- ❑ Verify that all DIP switches are set to OFF or down position.
- ❑ Verify that the power LED is illuminated and the telephone indicates **Go Online ?**
- ❑ Verify that no other user is trying to connect to the same Switch Card.
- ❑ **Model 1101**: Verify that the analog line connected to the Telco line jack has dialtone.
- ❑ **Model 1101**: Verify that no other device is connected to the same analog line. (ie: modems, fax machines, phones)

Switch Card and Rack
- ❑ Check that each card is seated properly in the Rack.
- ❑ Check that LEDs are illuminated. If no one is connected to a Switch Card, Flash sequence should be:

  Yellow, Green, Green, Green,
  Or
  Yellow, Green, Yellow, Yellow.

- ❑ Check for obvious signs of wiring problems (ie: loose connectors)

Built-in Diagnostics

LED Blink Sequences

When a Switch Card is inserted into the Rack, the card displays a sequence of LED lights. Once the Switch Card has completely restarted, the flashes or blinks indicate the status of a different item.

Blink	See page…..in this Chapter
1	6-4
2	6-5
3	6-6
4	6-7

Note: The Model 3200 Switch Cards contain two LEDs (1 for each ISDN B-Channel), the upper LED is for Channel 1, and the lower LED is for Channel 2. The blink sequence for each Channel is identical.

Blink 1	**Green**	**Yellow**	**Red**
Meaning	Switch Card is online or COD active (or connecting)	Switch Card is offline.	A remote user has flagged the Switch Card. (PBX flagged or made busy) (see page 6-24)
Action	None	None	Check with remote user to determine what problem occurred. Either clear the flag or make it busy using the Switch Manager Interface.

Table 6-1. Blink 1

Blink 2	Green	Yellow	Red
Meaning	Lucent digital port detected.	DSP error with the Switch Card. Potential hardware fault.	Switch Card is not connected to a valid Lucent digital port. DSP OK
Action	None	Try removing the card and re-installing it. Try a different slot. Contact Tech Support if problems persist, board may need to be serviced or replaced.	Check wiring between the ECS and the Model 3000 Rack. Check the pinouts on the 50 pin connectors documented in Chapter 3. Make sure the circuit pack in the Lucent DEFINITY ECS is supported. *Note: The Model 3000 only supports 2 wire digital phones and circuit packs.* Check cable length between ECS and 3000 Rack. (maximum cable length is 500ft)

Table 6-2. Blink 2

Blink 3	**Green**	**Yellow**	**Red**
Meaning	**Model 3100:** Card is operational, and modem has previously connected. **Model 3200:** Card is online, SPID numbers OK	**Model 3100:** Card is operational, but modem has never connected. **Model 3200:** ISDN offline Or wrong SPID	**Model 3100:** Modem error with Switch Card. Potential hardware fault. **Model 3200:** ISDN inactive (not connected)
Action	None	**Model 3100:** Try to connect to the Switch Card with remote module. **Model 3200:** Check ISDN Parameters.	**Model 3100:** Try removing the card and re-installing it or try a different slot. **Model 3200:** Check ISDN connections. Contact Tech Support if problems persist, board may need to be serviced or replaced.

Table 6-3. Blink 3

Blink 4	Green	Yellow	Red
Meaning	**Model 3100**: Card has detected a ring and received an incoming call. Has not necessarily actually connected. **Model 3200**: Card is functioning normally	**Model 3100**: Card is operational, but has never detected a ring or received an incoming call. **Model 3200**: N/A	**Model 3100**: Switch Card has received two or more abnormal disconnects. With the Switch Management Interface, check the **Abnormal call disconnects** Status box at the bottom of the **Status** tab. (It provides information and User IDs associated with the abnormal disconnects.) **Model 3200:** Error condition
Action	None	**Model 3100:** Call the phone number of the analog line connected to the Switch Card. Once the card detects a ring, the light should start blinking green. **Model 3200:** N/A	**Model 3100:** Using the Switch Management Interface, check for excessive error codes on the Statistics tab. Check the **Abnormal call disconnects** Status box at the bottom of the Status tab for the reasons and user ID's associated with the abnormal disconnects. (see page 6-39) **Model 3200:** Contact customer support

Table 6-4. Blink 4

Remote Phone Error Messages

IMPORTANT NOTE: *In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message displayed on the remote phone.*

Remote Module Model 1101

Error Message displayed on remote phone	**see Table……..**	**on page…….**
DSP Fatal Error	6-13	6-18
Line Busy	6-10	6-15
No Carrier	6-6	6-10
No Dialtone	6-5	6-9
Password not verified	6-8	6-12
Port Disconnect	6-13	6-18
User Abort	6-11	6-16
V42 Connect failed	6-7	6-11

Remote Module Model 1101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message displayed on the remote phone.

Error Message on Remote Phone	Possible Cause	Action
Connect Error No Dialtone	The remote module cannot detect a dialtone on the analog line at the remote location	Check to ensure that RJ-11 connector is properly seated in the "Telco Line" port of the Remote Module 1101. Plug the phone cable into a standard analog phone to determine if you are receiving dialtone.

Table 6-5. Connect Error /No dialtone

Remote Module Model 1101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message on the remote phone display.

Error Message on Remote Phone	Possible Cause	Action
Connect Error No Carrier	The modems cannot negotiate a connection. Either there is noise on the analog line, or the remote unit is calling the wrong phone number.	Ensure that the proper **PBX Phone Number** is entered into the **Dial numbers** menu on the remote module. Ensure that it is placing a call to Switch Card by listening for the ring and modem answer on the remote module speaker. Restart the Switch Card. (see page 6-4 for LED blink sequence)

Table 6-6. Connect Error/No Carrier

Remote Module Model 1101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message on the remote phone display.

Error Message on Remote Phone	Possible Cause	Action
Connect Error V42 Connect Failed	Could not negotiate the error correcting protocol. The likely cause is either extreme noise on the modem connection or the Switch Card cannot recognize a Lucent ECS digital port.	Observe the 2nd blink of the LED sequence on the Switch Card. If the 2nd blink is RED, the problem is with the Lucent ECS digital port. Check the cabling on the 50 pin connector according to the Tables in Chapter 3. If the 2nd blink is green, the problem is likely due to lost data packets associated with phone line noise. Check the Switch Card statistics and look for error codes as described on pages 6-30 to 6-32. If the 2nd blink is yellow, there is a DSP error condition. Contact customer support.

Table 6-7. Connect Error/V42 Connect Failed

Remote Module Model 1101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message on the remote phone display.

Error Message on Remote Phone	Possible Cause	Action
Connect Error Password Not Verified	The wrong password was entered or data packets are being lost over the modem connection.	Using the Switch Management Interface, look at the Status of the Switch Card. Observe Login failures. Each failed login attempt will be recorded. If receiving many of these, upload a new password group to your Switch Card, see *"How to Upload Passwords to Cards"* in Chapter 5 for more information. If certain that the password being entered is correct, check the error codes on **Statistics** tab and reference the tables on pages 6-30 to 6-32. *NOTE: Lost data packets prevent the password from being sent or received properly. Try lowering the 'Connect Rate" on the remote module.*

Table 6-8. Connect Error/ Password Not Verified

Remote Module Model 2101

IMPORTANT NOTE: *In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message displayed on the remote phone.*

Error Message displayed on remote phone	see Table…	on page…….
Call Prog Tout	6-11	6-16
Channel in use	6-9	6-14
DSP Fatal Error	6-13	6-18
Invalid number	6-11	6-16
Invalid SPID	6-9	6-14
Line Busy	6-10	6-15
Line Inactive	6-9	6-14
Line Not Ready	6-9	6-14
No Answer	6-10	6-15
No Carrier	6-10	6-15
No Dialtone	6-10	6-15
No SCC tranmsit	6-13	6-18
Port Disconnect	6-13	6-18
Problem Continue	6-12	6-17
User Abort	6-11	6-16
V42 Connect Fail	6-11	6-16

Remote Module Model 2101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message displayed on the remote phone.

Error Message on Remote Phone	Possible Cause	Action
Line Inactive	There is a problem with the physical connection with the ISDN line interface.	Ensure your Remote Module is fully connected with the ISDN line, check cables and jack connections.
Line Not Ready	Invalid SPID or wrong switch type. The ISDN Remote Module is not responding.	Check ISDN parameters. The ISDN Remote Module is not connecting to the ISDN Network. Ensure the ISDN parameters and dial numbers are correct and the ISDN Remote Module connects to the line.
Invalid SPID	The SPID numbers do not match the DN and access to the ISDN failed.	Check ISDN parameters. Ensure you entered the correct SPID and DN pair combinations.
Channel in Use	If the previous call failed to connect, the network requires a delay between the next call attempt. This indicates that not enough time has elapsed since the last failed attempt.	If connection fails, re-attempt to *Go Online*.

Table 6-9. Remote Error Messages

Remote Module Model 2101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message displayed on the remote phone.

Error Message on Remote Phone	Possible Cause	Action
No Dialtone	Invalid number entered for PBX dial number Possible problems with ISDN network, no route is available, or channel is not operating correctly. Too many calls received at the central site.	Check PBX dial number and reprogram if necessary. Check with ISDN service provider and request that they test the ISDN line, Wait a few minutes and try the call again. If the problem persists, check with your system administrator.
No Answer	Call has been rejected by far end (Switch). No user response.	May have dialed the wrong PBX dial number. Check the number and dial again. If the problem persists, check with your system administrator.
No Carrier	On initial connection did not receive connect acknowledge from network.	Check physical ISDN connections and parameters. Possible network problem.
Line Busy	The PBX dial number is busy. Someone is on line with the Switch Card.	Ensure you entered your dial numbers correctly and check that no one else is currently using the Switch Card.

Table 6-10. Remote Error Messages

Remote Module Model 2101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message displayed on the remote phone.

Error Message on Remote Phone	Possible Cause	Action
Invalid Number	The PBX dial number is an invalid number.	Ensure you have entered your dial numbers correctly.
Call Prog Tout	Call progress time out. The module was waiting for a message from the network that it did not receive. Another Remote Module may be connected	Possible ISDN network problem. Check PBX number. Check with your ISDN service provider and have them check the line.
User Abort	The User pressed the Hold button three times to abort the connection process.	No action required.
V42 Connect Fail	The Remote Module and Switch Card connect but the IVP does not synchronize. Possible ISDN Connect rate problem. The Switch Card PBX digital port may be off line or disconnected, or the Remote Module is connected to an incompatible communication device. The ISDN link has too many errors to maintain a valid connection.	Try changing your ISDN Connect Rate from Auto to 56k. Check with your system administrator. Check with the ISDN service provider and have them test the line.

Table 6-11. Remote Error Messages

Remote Module Model 2101 *continued*

Symptom: Remote Module cannot connect to Switch Card

Action: In the event that the remote module cannot establish a connection to the Switch Card, it is very important to note the error message displayed on the remote phone.

Error Message on Remote Phone	Possible Cause	Action
Problem Continue	If you are still experiencing difficulties, the suitability of the phone lines is in question.	Check with your phone company to ensure the line requirements have been met.

Table 6-12. Remote Error Messages

Remote Module Model 2101 *continued*

Fatal Errors

If a fatal error occurred during the previous operation cycle (the last time the extender was powered up), the remote display telephone shows 'The Last Error Was,' followed by a message. Table 6-13 contains the possible fatal error messages.

Error Message on Remote Phone	Possible Cause	Action
DSP Fatal Error	DSP communication failed. If it continues to be displayed, then possible hardware problem.	Contact customer support
No DSP Response	The DSP is not operating correctly.	Try re-powering the unit. If problem persists, contact customer support.
Port Disconnected	The Digital port at the Remote Module was disconnected during normal operation.	Reconnect the port.
No SCC Transmit	If it continues to be displayed, then possible hardware problem.	Try re-powering the unit. If problem persists, Contact customer support.
Unknown Error	Unknown fatal error occurred on previous power up.	Try re-powering the unit. If problem persists, contact customer support.

Table 6-13. Fatal Error Messages

SMI Status Menu Information

Overview

The Switch Management Interface has a built in troubleshooting status menu that displays critical information for each Switch Card in the Rack.

Model 3100 Status Screen, see Figure 6.1
Model 3200 Status Screen, see Figure 6.2

Status Information

The status information available includes:
Up time
User
Login Failures
Never connected
Ring detected
Disconnects
DSP
Digital Port
Connection
Line
Telephone System

Flags

PBX Flag (Model 3100 only)
Make Busy

(see page 6-24)

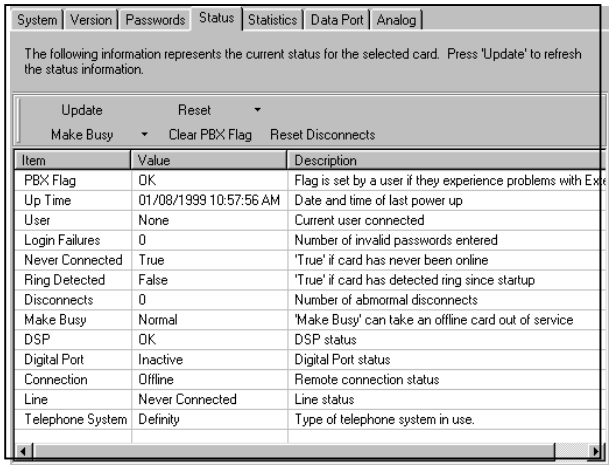

Figure 6.1. Model 3100 Status Screen

SMI Status Menu Information *continued*

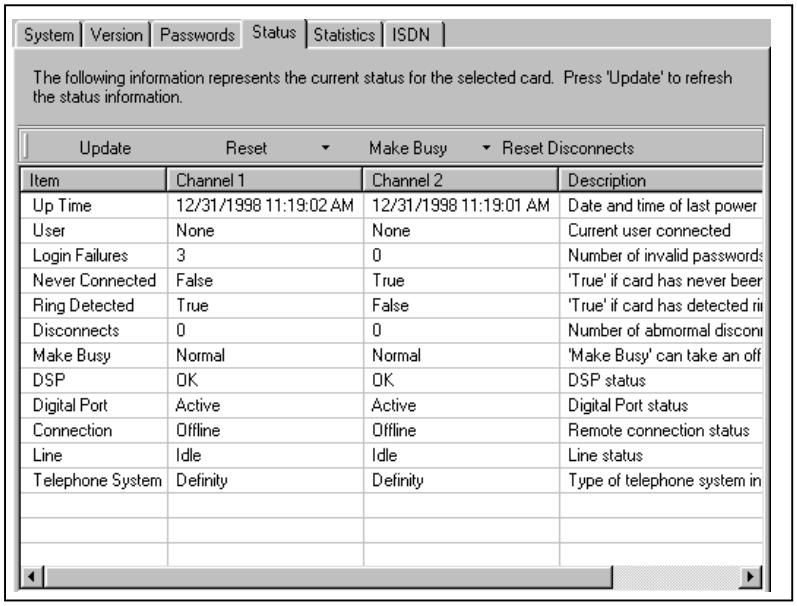

Figure 6.2. Model 3200 Status Screen

SMI Status Menu Information continued

Procedure

1. Click **Hardware**. All cards installed in the Rack will be displayed along with slot position, card model, and the User Group assigned to the card.

2. Select any one card and click **Status** and the following information is displayed:

*Note: Click **Update** to get the most recent status information for the Card.*

Item	Description	Action Required
Up time	Time since power up	none
User	Current online user (User ID)	none
Login Failures	This count is incremented if a remote user has entered an invalid password. *Note: This count stops at 255. Press* Reset *button if the counter exceeds 255.*	❑ Ensure users have correct passwords. ❑ Unauthorized user may be trying to logon to card. ❑ Wrong password user group uploaded to the specific card.
Never connected	This is set when the modem connects.	**False**: none **True:** ❑ Try to connect to the Switch Card using the remote module. ❑ If the card has been in service for a while and has never gone online (connected) verify if the card has ever rung or if abnormal disconnects count is high. ❑ Check that the digital port is online ❑ Check wiring for this slot ❑ Verify analog line number or ISDN dial number.

Table 6-14. Status Definitions

SMI Status Menu Information *continued*

Item	Description	Action Required
Ring detected	This is set if a ring has occurred.	**True**: none **False:** ❑ Try to connect to the Switch Card using the remote module. ❑ Check wiring on the 50-pin connector ❑ Swap bad card with known working one, and verify wiring of slot. ❑ Swap bad card with known working slot, and try to connect.
Disconnects	If something causes the Switch Cards to disconnect abnormally, a disconnect message is sent and this counter increments.	❑ Check other cards to determine if all units are experiencing the same problem. ❑ Check LED sequence ❑ Check the last four abnormal disconnects. *Note: At the bottom of the **Status** tab for each Switch Card, the **Abnormal call disconnect status** table displays the time and the reason for the last four abnormal disconnects.*
DSP	Error, OK	**OK:** none **Error:** There is a problem with the Switch Card. ❑ Try resetting the Card. ❑ If problem persists, contact Customer Service.

Table 6-15. Status definitions

SMI Status Menu Information continued

Item	Description	Action Required
Digital Port	Digital Port status	**Active:** Digital port is connected. **Inactive:** ❑ Digital port not connected ❑ Check wiring
Connection	Valid statistics are; Offline, connected, or COD waiting	None
Line	Line status	**Model 3100** **OK:** none **Error:** ❑ Click **Reset** to reset the Card ❑ Contact customer service if not resolved. **Never connected**: ❑ Try to connect to the Switch Card using the remote module. ❑ Analog line may have a problem. Verify wiring to Rack. ❑ Swap card with known working one, and try to connect. **Model 3200** **Idle:** SPIDs are properly programmed. No action required. **Line Inactive:** ❑ ISDN line not connected ❑ Check wiring. ❑ Contact customer service if not resolved. **Connected**: ❑ Indicates Remote Module is connected to the Switch Card.
Telephone System	Indicates the phone system type running on the Card.	**If wrong Telephone System indicated:** ❑ Check Switch Card DIP switches ❑ Contact customer service.

Table 6-16. Status definitions

SMI Status Menu Information continued

Item	Description	Action Required
PBX Flag (Model 3100 Card only)	If set, (see next page for procedure) the Switch Card is flagged by the remote module to be checked out by the administrator.	❑ Check with remote user for specific problems. ❑ Click **Make Card Busy** to take the Switch Card off-line.
Make Busy	Used as a tool to take problem cards out of service.	**Normal:** none **No answer**: ❑ Prevents the card from connecting. ❑ When set, sends a command to disable auto answer. **Off Hook: (3100 only)** ❑ Card will not allow incoming connect request to occur. ❑ The modem has placed the analog line **off hook**. (users trying to connect will get "Busy" signal)

Table 6-17. Flag definitions

SMI Status Menu Information continued

There are five additional buttons available to the administrator.

Button	Function
Update	Updates information in the status window.
Reset; Reset now Delayed reset	**Reset now**: Immediately resets the selected card and clears the PBX Flag. This will disconnect any current user on the Switch Card. **Delayed Reset**: Resets the selected card as soon as there are no users connected to the Switch Card.
Make Busy	Takes the card off-line, as soon as the user disconnects, preventing users from re-connecting.
Clear PBX Flag (Model 3100 only)	Sets the analog card to indicate that it should be working normally. This flag will be cleared until a user has problems connecting to this Switch Card. The card could be flagged again.
Reset Disconnects	Resets the abnormal call disconnects status menu.

Table 6-18. Flag Reset Options

SMI Status Menu Information *continued*

How a Model 1101 Remote User "Flags" a Bad Analog Switch Card

Q: Why ask a remote user to flag a card?
A: Flagging a card is done, at the request of the administrator, to find out if the operational problems are related to a specific Switch Card or a remote user's Extender.

When the Remote user is online (connected) with a faulty Switch Card, they should press the **HOLD** key four times to access the Disconnect menu. When the telephone screen displays the Disconnect menu, the user should press the "*" key. This operation will clear the Disconnect menu, and will replace it with "Switch Unit Flagged." This message will remain on the LCD display for 1.5 seconds, and once it is cleared, the Remote Module will reconnect the user for normal operation.

Note: If the problem is with every connection, it may be the remote Extender that is having problems. If it is periodic, based on different connections, then it may be a specific 3100 card that has problems.

SMI Statistics Menu Information

Introduction The Switch Management Interface allows the administrator to obtain detail statistics information on a specific Switch Card in the Rack. If there are any problems with the card or the connection, the statistics menu will display the error by incrementing the **Value** field for the specific error code. The **Value** (or Channel 1 and Channel 2 for ISDN Cards) digit is a counter and will continue to display errors, until the card's stats are reset or until the card has been re-started.

Procedure

1. Click **Hardware**. All cards installed in the Rack are displayed along with slot position, card model, and the user group assigned to the card.

2. Select a Switch Card and click **Statistics.** The following information is displayed:

   Model 3100 Switch Cards: see Figure 6.2, page 6-28.

   Model 3200 Switch Cards: see Figure 6.3, page 6-29.

SMI Statistics Menu Information *continued*

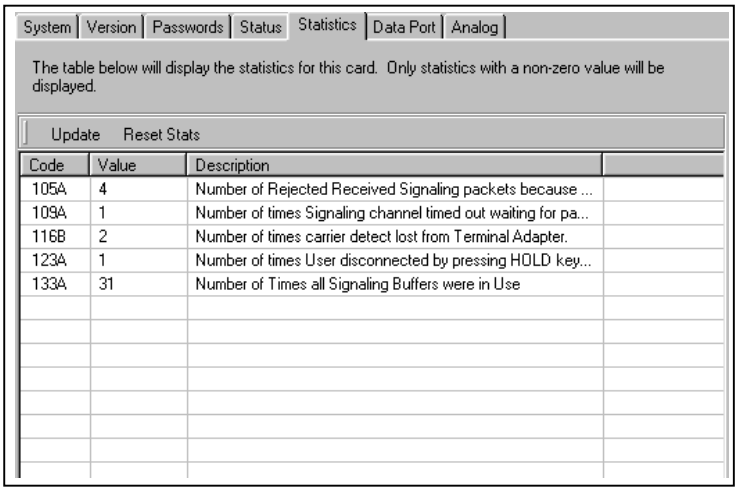

Figure 6.3. Model 3100 Statistics Menu

Code	Displays active Error Code (see page 6-30)
Value	A running digit which lists the quantity of Error Codes
Description	Description of Error Codes

Note: There are two buttons available to the administrator at this point.

Update button	Updates the statistics to the current count
Reset Stats button	Will reset the stats to zero for selected card

SMI Statistics Menu Information *continued*

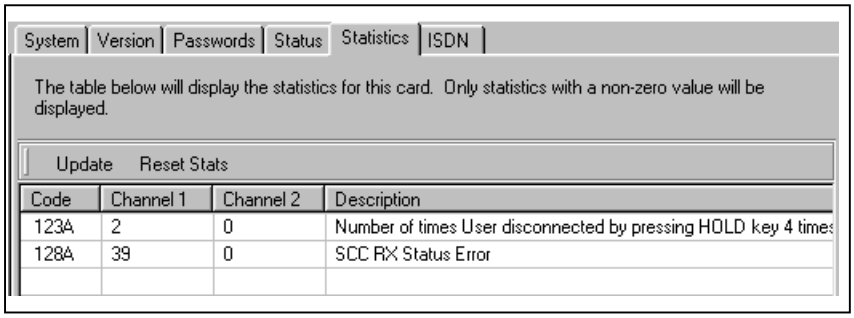

Figure 6.4. Model 3200 Statistics Menu

Code	Displays active Error Code (see page 6-30)
Channel 1	A digit which totals the quantity of Error Codes for the User on Channel 1.
Channel 2	A digit which totals the quantity of Error Codes for the User on Channel 2.
Description	Description of Error Codes

Note: There are two buttons available to the administrator at this point.

Update button	Updates the statistics to the current count
Reset Stats button	Will reset the statistics to zero for selected card.

Error Codes

A Could occur regularly. A common error that should not directly impair module operation. *Example: Out of sequence user data packets.*

B Should not occur often. *Example: Something has been unplugged, or if it goes online without the DEFINITY® ECS connected, get a V42 error.*

C Should not occur at all. Probably the result of a hardware problem (or failure). *Example: Number of times the DSP communication failed.*

Error Codes		
Error Code	**Description**	**Cause**
101A	Number of received ISDN voice packets that contained a CRC error.	
102A	Number of received ISDN TCM signaling packets that contained a CRC error.	
103A	Number of received ISDN user data packets that contained a CRC error.	
104A	Number of received modem packets or ISDN packets that contained an invalid V42 address.	
105A	Number of rejected received modem or ISDN signaling packets because they were out of sequence.	
106B	Number of times maximum number of signaling packet re-transmissions exceeded (Caused Digital Port Data to be lost).	Could be caused by a bad ISDN or Analog line.
107B	Number of times signaling channel had to be re-synchronized.	
108B	Number of times signaling channel had no data for 16 consecutive seconds.	
109A	Number of times signaling channel timed out waiting for packet acknowledgment.	Packets (phone data) were sent with no acknowledgement, there may have been errors on the ISDN/Analog line.

Table 6-19. Error Codes 101A to 109A

Error Codes *continued*

Error Codes		
Error Code	**Description**	**Cause**
110C	Number of times signaling channel transmit locked up (transmit buffers full when no data to send).	
111A	Number of rejected received User Data packets because they were out of sequence.	
112B	Number of times maximum number of User Data packet re-transmissions were exceeded.	
113B	Number of times User Data channel had to be re-synchronized.	
114A	Number of times User Data channel timed out waiting for packet acknowledgment.	
115B	Number of times User Data channel discarded data due to receive overflow (probably because host did not observe flow control).	
116B	Number of times carrier detect lost from Terminal Adapter.	
117C	Number of times Terminal Adapter check failed.	
118C	Number of times communications to DSP failed.	
119B	Number of times digital port link re-activated.	Digital port connection to Switch Card may have been lost.
120B	Number of times digital port connection was lost or de-activated.	
121A	Number of times digital port data was re-transmitted.	
122B	Number of times IVP (V42) link failed.	ISDN connect rates don't match (Switch and Remote). Not capable of 64K data calls.
123A	Number of times user disconnected by pressing HOLD key 4 times and then disconnecting.	Indicates that the user has disconnected by pressing **Hold** button 4 times and selecting **Disconnect**.

Table 6-20. Error Codes 110C to 123A

Error Codes *continued*

Error Codes		
Error Code	**Description**	**Cause**
124C	Number of times Synchronous Communications Controller IC transmit locked up.	
125B	Number of fatal errors that caused unit to restart (caused by errors 124C, 118C, and 120B).	
126C	Invalid Length of SCC Tx packet	
127B	SCC Transmit Busy	
128A	SCC Rx Status Error	DTE equipment is sending data at the wrong baud rate.
129A	SCC Tx Status Error	
130A	Invalid Voice Packet ID detected	
131A	Number of times all user data buffers were in use	
132A	Number of times user data packet too long	
133A	Number of times all signalling buffers were in use	
134A	Number of times signalling packet too long	
135A	Bad frame checksum (FCS). Related to poor analog line conditions.	Poor analog line. There may be hits on the line.
135X	Reserved for future use	
136A	Serial transmit buffers overflow to modem	
136X	Reserved for future use	
137A	Serial receive buffers overflow to modem.	
137X	Reserved for future use	
138B	V42 RX Timeout - Modem Retrain	Modem had to re-train (reconnect), possible power outage on Switch Card.
138X	Reserved for future use	
139A	PBX connect request error	Switch Card could not connect to the Remote Module.
140X	Reserved for future use	
141X	Reserved for future use	

Table 6-21. Error Codes 124C to 141X

Specific Functional Problems

Audio Problems *(Model 3100 only)*

Symptom: Gaps in conversation or audio sounds choppy

Action: This problem is most likely caused by bit errors between the remote and switch modems.

Procedure:

1. From the Switch Management Interface choose the **Hardware** tab on the left.

2. Select the card in question, then select the **Statistics** tab on the right.

3. Check for excessive error codes. See pages 6-30 to 6-32 for a detailed listing of error codes.

4. Reduce the connect rate from the remote module. The optimal rate for voice only functionality is 19.2 Kbps. Extender will work for voice only with rates as low as 14.4 Kbps.

5. If the problem persists, contact the phone company to improve the quality of the analog lines.

Audio Problems (Model 3100 only) continued

Symptom: Muffled audio, low volume or echo present on some calls
Audio quality problems of this nature can be related to a number of things.

Action:

- **Digital Phone supported** – Ensure that the corresponding remote module supports the Lucent digital phone being used.

- **Headset** – Confirm that the digital phone being used officially supports that headset. Any audio quality problems that result between a headset and phone can be magnified when they are used remotely.

- **Speakerphone** – Speakerphones are more susceptible than handsets to background noise. In general, audio quality will always be better with the handset or headset, but speakerphones should work fine if background noise is limited.

- **Errors in transmission** – Sometimes errors in passing data from the remote to the switch or visa-versa can cause audio problems. To check for these types of errors, run the Switch Management Interface. Choose the **Hardware** tab, select the card in question, and select the **Statistics** tab on the right. All errors since the last reset are displayed. See pages 6-30 to 6-32 for a detailed description of error codes. These errors are frequently caused by analog/ISDN line problems. Try swapping out the analog/ISDN line or have the user connect at a lower connect rate.

Audio Problems *(Model 3100 only) continued*

- **Phone or phone line used by other party** – If audio quality problems are intermittent, it may be related to the phone or phone line in use by the person to whom you are speaking. For example, chances are you are not talking to another digital extension off the DEFINITY ECS. Sometimes you may be talking to someone who is connected through a marginal quality analog line, trunk line, or telephone. This may cause degradation in audio quality, and sometimes this degradation can be magnified over a remote phone.

- **Faulty Switch Card** – If problems seem intermittent and do not affect all users, it may be a faulty or out-of-date Switch Card. It may need to be upgraded, serviced, or even replaced. Have the remote user flag the card that is causing problems.

  How to flag a card: To flag a card while online, the remote user would press the **Hold** key four times to go to the **Disconnect** menu. Then the user simply presses the star key "*" from the remote phone. This will flag the Switch Card, which may be causing problems so that you can examine it at a later time.

Data Connection Problems (Model 3100 only)

Symptom: Cannot connect PC or terminal to data network

Action: Users who want simultaneous voice and data access through the Model 3100 Switch Card, typically connect their PC or terminal to the data server(s) through a Remote Access Server (RAS) or Terminal Server. In order for this to work, all the communications settings have to match. To troubleshoot a data connection problem do the following:

Procedure

1. Check the COM port settings of ALL the devices involved. This includes the remote PC or terminal, the Remote Module 1101, the Model 3100 Switch Card, and the RAS or terminal server. All the COM port settings must match. For example, if the PC and RAS are set for 19.2 Kbps with 8 data bits, No parity, and 1 stop bit, those are the exact settings needed by the remote module and Switch Card. For more information about these settings see *How to set the Switch Card Data Port Settings*, in Chapter 5.

2. Make sure the RS-232 cable on the Switch card is plugged into the corresponding COMA (not COMB) port on the Rack backplane.

3. Make sure that the remote module is actually online and connected before attempting to access data. The remote module does not place a separate call for data access, it is multiplexed with the call already made for voice functionality.

4. If data access still does not work, make sure that the PC or terminal can connect directly to the RAS or terminal server. Take the PC or terminal into the office and instead of using the 1101 and 3100, connect the PC or terminal directly to the RAS or terminal server using a Null Modem Cable. If this connection does not work, the problem is not with the remote module or Switch Card. If this connection does work, re-check the COM port settings of the remote module and Switch Card. They must match that of the PC or terminal AND the RAS or terminal server.

Data Connection Problems *(Model 3100 only) continued*

5. Make sure the unit is cabled properly. While connecting a PC or terminal directly to a device usually requires a Null Modem Cable, connecting to these devices through the Switch Card requires straight - through RS-232 cables. A straight-through cable is required on both the remote and the switch end.

Data Connection Problems *(Model 3100 only) continued*

Symptom: Not satisfied with data performance

Action:

Optimally, the DEFINITY Extender Model 3100 uses a reliable 33.6 Kbps connection for data functionality. Data rates will vary according to the following guidelines:

1. When a voice call is active, data transfer operates at 10 to 12 Kbps.

2. Without an active voice call, the data rate is approximately 20 to 22 Kbps.

Note: If you are not receiving these rates, check the ***Connect Rate*** *on the remote module. Increasing the connection rate will increase data throughput. However, increasing the connection rate can also increase the possibility of bit errors between the modems, and this will in turn reduce the audio quality on voice calls. The optimal connection rate is totally dependent on the quality of the analog lines at the remote and switch sites.*

Abnormal Disconnects

Symptom: **Remote Module unexpectedly disconnects from Switch Card**

Reason for Disconnect	Possible Cause	Action
Lost Carrier	**Model 3100:** Either the modems dropped the line due to errors, or the remote module dropped the analog phone line or digital terminal. **Model 3200:** Problem with ISDN line or the network.	**Model 3100:** Check the **Statistics** tab to view any unusual or excessive errors and refer to tables on pages 6-30 to 6-32. Reset the stats after the remote user connects. Use the Make Busy feature in the Switch Management Interface to prevent new connection attempts. When the user is dropped, expectedly or unexpectedly, a complete detail of that one connection will be visible. Make Busy will actually prevent further connections until cleared. If the problem seems to be excessive modem errors, lower the "Connect Rate" on the remote module. If there are no unusual or excessive errors on the **Statistics** tab, the problem is probably caused by a cabling problem on the remote module. Either the digital terminal or the analog line (Model 3100) or ISDN line (Model 3200) at the remote site appears to have been disconnected. Disable specific features, such as call waiting, on the remote modules.

Table 6-22. Unexpected Disconnect/Lost Carrier

Abnormal Disconnects continued

Symptom: **Remote Module unexpectedly disconnects from Switch Card**

Reason for Disconnect	Possible Cause	Action
Lost V42	**Model 3100:** Analog line on the Switch Card has been lost or data packets have been dropped between the modems. **Model 3200:** Possible connect rate problem or network is not capable of 64K data calls.	**Model 3100:** Check cabling for the PSTN/ analog line connectors on the Rack. It appears that the analog line has become unavailable. Check the **Statistics** tab to look for unusual or excessive errors. Lower the "Connect Rate" on the remote module. **Model 3200:** Check that the connect rates are the same for the Remote Module and Switch Card.
Lost Signal	Switch Card has lost the digital line into the Lucent ECS	Check cabling from the Lucent ECS to the Rack. Check the ECS and make sure port is still active.

Table 6-23. Unexpected Disconnect/Lost V42, Lost Signal

COD/Dialback Problems

Symptom: **Unit does not wakeup from COD mode or Dialback does not work**

Possible Causes:

1. This is usually caused by an error in the **REM Phone Number** setting in the **Dial numbers** menu on the remote module. Confirm the phone number is accurate.

Note: If the Switch Cards are connected to analog/ISDN lines behind the DEFINITY ECS (instead of PSTN lines), preface the phone number with the correct access code to access outside lines ("9" is often used to access outside lines). Also, take into consideration whether a "1" or the area code is needed.

2. This problem could also be related to intermittent connection errors. See table on page 6-8 for more information on troubleshooting these sorts of problems.

Note: For Model 3200 Switch Cards, the ISDN service from the Switch Card to the Remote Module may not be capable of 64K data . Consult with your ISDN service provider.

How to Reset a Forgotten Administrator Password

IMPORTANT NOTE*: This procedure allows anyone, with physical access to the Rack, the ability to reset the administrator password. The Rack must be installed where it cannot be physically accessed by unauthorized persons.*

1. Connect a PC to the COMA port of Card 0.

2. Open a Terminal application program on the PC.

   Note: Make sure the COM port settings are set to 9.6 Kbps, No parity, 8 Data bits, 1 Stop bit

3. Remove Card 0, then plug back in. The Switch Card status LED will blink as follows;

   Red flashes, three green flashes, four yellow flashes, then three sets of eight yellow blinks.

4. During the first set of eight yellow blinks, type the word **MENU** (Model 3100) or **CTRL T** (Model 3200) from the terminal screen. The Configuration Menu should appear on the screen.

5. Select **Configure System**.

6. Select **Passwords**.

7. From the prompt *Enter administrator password*, type **RESET.**

8. From the prompt *Reset all Passwords (Y/N)?*, type **Y**

9. Select **Exit**.

Note: This procedure will erase all passwords on Card "0", and reset the administrator password to 000000. This password is used to access the Switch Management Interface.

Software Upgrades

7

Chapter Contents

7. Software Upgrades

Introduction This chapter will explain how to upgrade the software contained within the Flash ROM on the Switch Cards. The Switch Management Interface (SMI) can also upgrade the image code for the Model 3200 (ISDN) Remote Modules.

Note: It is important to run the most recent version of software.

How to Check Software Revisions

Procedure

1. Click **Hardware** to list all cards in the Rack, and select a Switch Card.

2. Click **Version** tab on the right column to check the software revision of the Switch Card.

Note: Refer to Table 7-1, on the next page, for a description of each item.

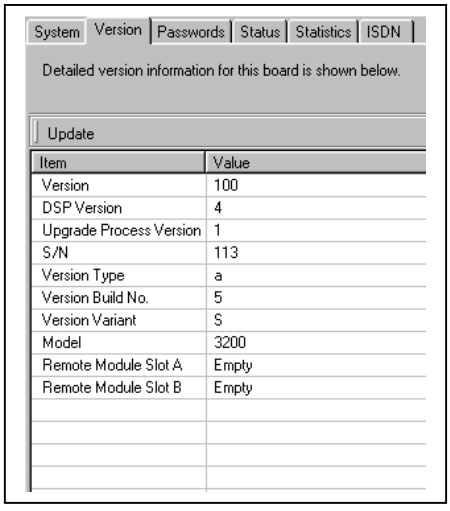

Figure 7.1. Card Version Information

Item	Value	Description
Version	100	Current version of software
DSP Version	4	Current version used by the DSP
Upgrade Process Version	1	Method used for upgrading
S/N	113	Serial Number of the Switch Card
Version Type	a	Type of build; a) Alpha b) Beta r) Released p) patch
Version Build No.	5	Build number of the software
Version Variant	S	Defines the capabilities of the Switch Card
Model	3200	Switch Card model 3100: Analog 3200: ISDN
Remote Module Slot A	Empty	Software info for the Remote Module connected to Slot A of the Switch Card. (Model 3200 only)
Remote Module Slot B	Empty	Software info for the Remote Module connected to Slot B of the Switch Card. (Model 3200 only)

Table 7-1. Version Information Table

Software Upgrades via the SMI

Upgrading the Switch Card Software

Procedure

1. Click **Upgrade** icon, the following screen appears.

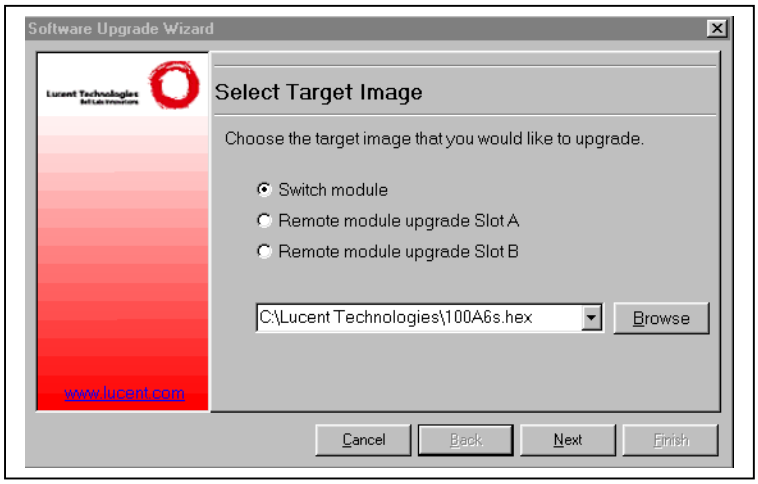

Figure 7.2 Select Target Image

2. Select **Switch module** for upgrading the Switch Cards, Models 3100 and 3200.

Upgrading the Switch Card Software *continued*

3. Click **Browse**, then select a file with the extension (*.hex) which is code intended for either Model 3100 or 3200 Switch Cards. Click **Open.**

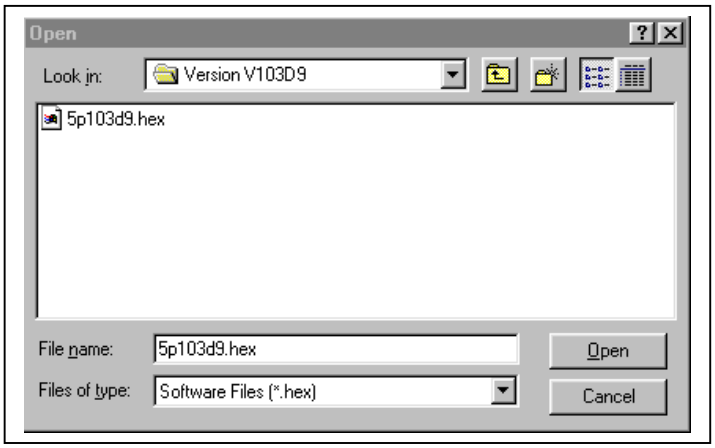

Figure 7.3 Select File

4. Click **Next** to continue the upgrade.

Upgrading the Switch Card Software continued

5. De-select the **All compatible cards** check box if only certain Cards shall be upgraded and press **Next**.

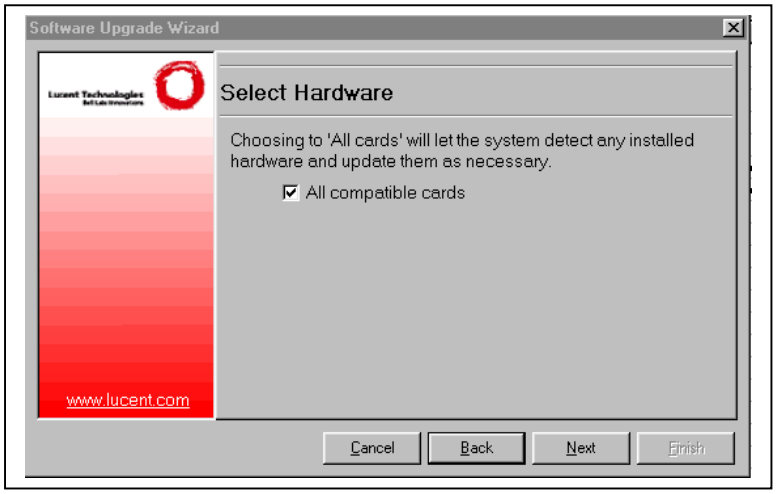

Figure 7.4. Select Hardware

Upgrading the Switch Card Software *continued*

6. Click the box next to the card(s) to be upgraded. Click **Next**.

*Note: If no Switch Cards are displayed, click the **Detect** button.*

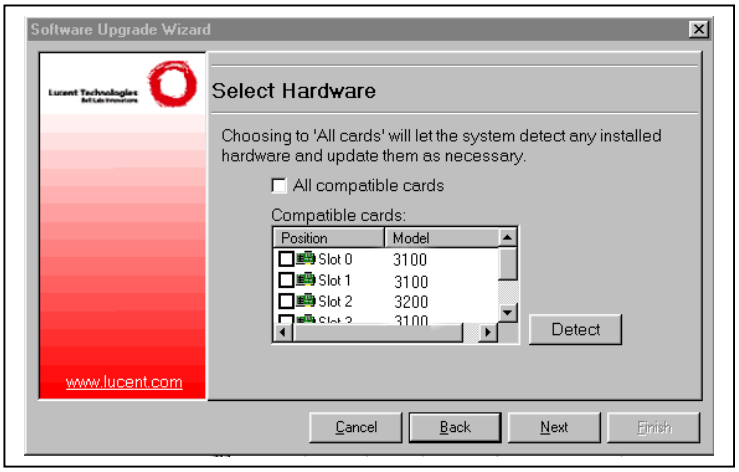

Figure 7.5. Card Selection

Upgrading the Switch Card Software continued

7. The upgrade process will finish and the screen displays the upgrade status for each Switch Card or Remote Module (Model 3200 only).

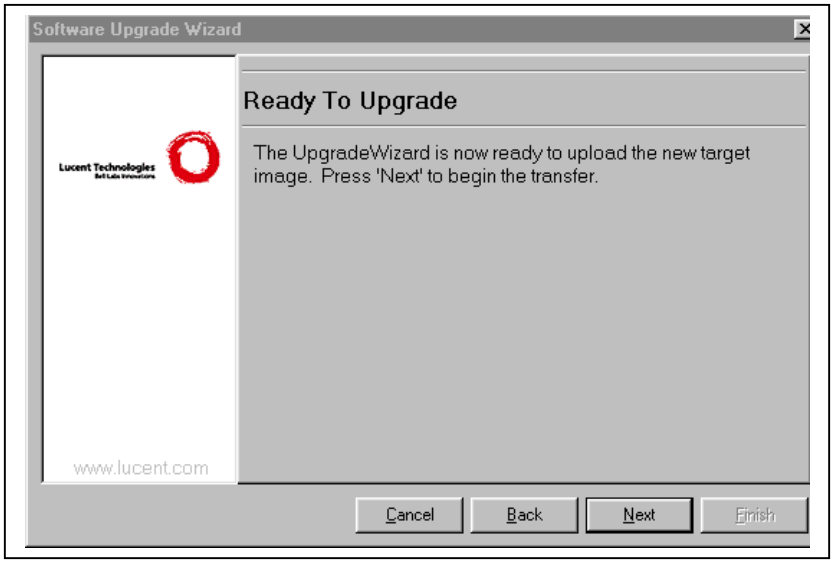

Figure 7.6. Ready To Upgrade

8. Click **Next.**

9. Reset the upgraded Switch Cards by selecting **Delayed Reset.**

10. Click **Finish.**

Notes:

- *Delayed Reset will only reset the selected switch cards when the line becomes available. The line will not be dropped when in use.*
- *The upgrade does NOT take affect until the Switch Card(s) are restarted*
- *The Switch Cards will be unavailable while they are being reset. This will take a few seconds.*

Upgrading the Remote Module Software (Model 3200)

Note: Applies to Switch Cards Model 3200 / Remote Modules Model 2101.

Procedure

1. Click **Upgrade** icon, the following screen appears.

Note: The Model 3200 Switch Card can hold two Remote Module image codes. It is then possible to be able to upgrade an ISDN Remote Module with the choice of either image.

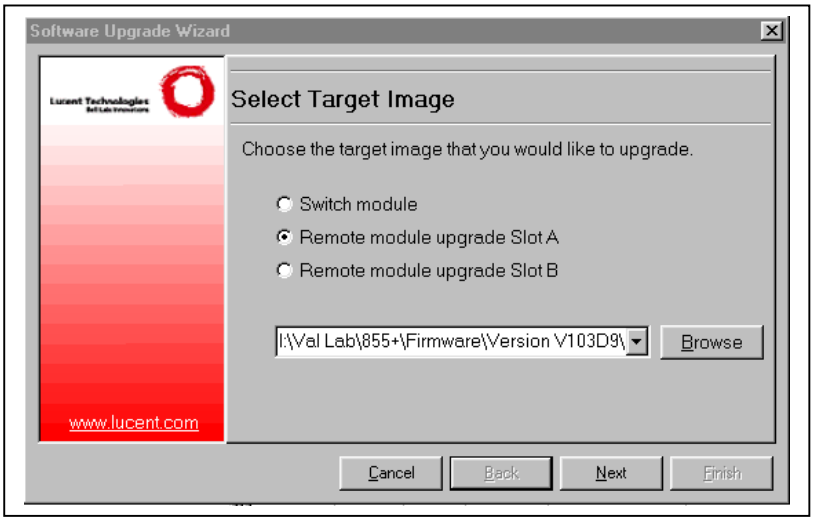

Figure 7.7. Select Remote Module

2. To send a Remote Module image code, select the appropriate slot (A or B).

Upgrading the Remote Module Software continued

3. Click **Browse**, then choose a file with an extension of "*.rmt" which is Remote Module image code. Click **Open.**

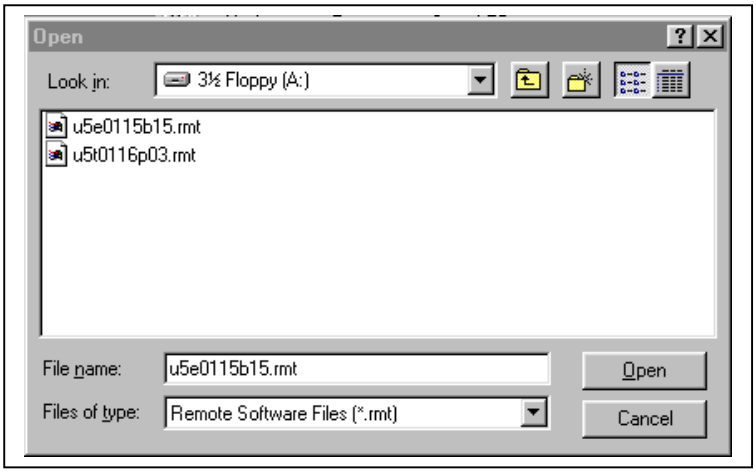

Figure 7.8. Select File

4. Click **Next**.

5. Continue with step 5 on page 7-6 to complete the upgrade process.

Software Upgrades via a Terminal Program
(Model 3100)

Upgrading the Switch Card Software

IMPORTANT: The Model 3200 Switch Cards cannot be upgraded using a terminal program.

Introduction

This upgrade process applies to the Switch Card and should take place when the Card is offline. Information for upgrading Remote Modules is found on page 7-14.

Note: When using a terminal program for software upgrading, only one Switch Card can be upgraded at a time. Repeat the following procedure for each Switch Card to be upgraded.

Setup

- ❑ The PC must be connected to the COMA port of the card to be upgraded.
- ❑ Ensure the terminal emulation package is configured for VT100, and the data rate is set to 9.6 Kbps, no parity, 8 bits, 1 stop bit.
- ❑ If the Rack is powered up, unplug the Switch Card and re-insert it into the Rack

  or

- ❑ If the Rack is powered down, power up the Rack.
- ❑ The Switch Card status LED will blink as follows;

Red flashes, three green flashes, four yellow flashes, then three sets of eight yellow blinks.

Procedure

1. During the first set of eight yellow blinks, type the word **MENU** from the terminal screen. The Configuration Menu should appear on the screen.

Upgrading the Switch Card Software *continued*

Procedure

From the Main Menu:

2. Select the ***Configure System*** menu option.

From the System Menu:

3. Select ***Software Upgrade***. The command will initiate the upgrade process.The module displays the following messages:

Last chance to stop... will force restart after upgrade.
Do you want to continue?
Enter Y to continue, any other key to abort.

4. Enter ***Y*** to continue. The message displays:

Please wait while flash memory is being checked…

The erase process takes about 15 seconds. The message *Erasing Flash Memory* displays as Flash ROM is being prepared to receive the new code.
The message *Successfully erased* displays.

The screen then displays the following message:
Please upload (to Extender) the S Record file using ASCII transfer protocol.
Waiting for upload file...

5. Select ASCII, or text file, upload protocol and select the S-record file (*.hex format) to upload to the module.

Note: You have 60 seconds to do this.

Upgrading the Switch Card Software *continued*

Procedure

The module then displays the following message:

Starting upload, have received and written up to line...

100

200

The line count continues in increments of 100 lines. The total can range from 9000 to 14000 lines depending on the size of the file. The process can take 10 or more minutes. When completed, the display shows the following message:

The file was captured and stored to flash with no errors

Verify Upgrade

Once uploaded, terminal displays:

Verifying new code...

If the test passed, the terminal displays:

Code Verified. Upgrade Successful!

Press Return Key to Restart Unit.

Press the return key to automatically restart the Switch Card and run the new software.

Upgrading the Remote Module Software

Introduction This section explains how to perform a software upgrade on the remote module from the Switch Card using a Terminal Emulation program..

Note: Please ensure the Switch Card is upgraded first before upgrading the remote module.

Procedure

1. Power up the Remote Module.
2. Go online with a Switch Card running the latest software.
3. From the remote phone, while online press the **HOLD** key four times to enter the online menu.
4. Press **3** until **Upgrade Remote?** Appears.
5. Press **OK** or **2** to start the remote module software upgrade.
6. The LCD displays (Model 3100)

   Are You Sure?

   Press **OK** or **2** to start.

   Press **No** or **3** to abort.

   OR

   The LCD displays (Model 3200)

   With SW version (followed by the version)?

   Press **OK** or **2** to use version displayed.

   Press **Next** or **3** to use another version or to exit.
7. Then the LCD displays: (Model 3200 only)

   Change to "x" Type? (where "x" is the different variant type)
8. Press **OK** or **2** to continue

   OR

   Press **NO** or **3** to abort

Upgrading the Remote Module Software continued

Procedure

9. The LCD displays:
   Are You Sure?
   Press **OK** or **2** to start.
   Press **No** or **3** to abort.

The LCD displays:
Starting, REM Upgrade
Erasing Flash at REM
0% Completed

The percentage value increases as the upgrade proceeds. When the upgrade is 100% completed, the new code is downloaded.

Verifying The Upgrade

The software must now be verified.
The remote phone should display: *Verifying Upgrade*

This process may take from 12 to 15 seconds depending on the code size. The remote phone will then display:
Upgrade Successful!

The remote phone displays: *Restart Units?*

Press **OK** or **2** to disconnect from the Switch Card and restart the remote module with the upgraded software.

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Glossary

8

8. Glossary

+12 vdc
12 volt direct current.

120 VAC
120 volt alternating current (North American standard electrical supply).

B

Baud Rate
A measure of transmission speed over an analog line.

BRI
Basic Rate Interface. One of two subscriber “interfaces” in ISDN. In BRI you get two bearer B-channels at 64 kilobits per second, and a data (or D) channel at 16 kilobits per second.

C

Call on Demand
Call on Demand (COD) is a feature which when active, will automatically reconnect the Remote Module when you make or receive a new call or when you press any button other than the Drop button (Redial on the 6400-series telephones) or dialpad button.

D

Dedicated Subscriber Lines
Communication lines (usually twisted pair) that are used to connect on-premise telephone equipment (such as a PBX) to the Central Office. Also referred to as direct lines.

DCE/DTE

In the RS-232 standard there are Data Communication Devices (DCE) devices (typically modems or printers) and Data Terminal Equipment (DTE) devices, which are typically personal computers or data terminals.

Dialback

A cost saving feature which allows the Switch Card to disconnect, then "Dialback" the Remote Module when a connection is made.

Dial Line

A telephone line which is part of the Public Switched Telephone Network and is accessed through the DEFINITY Extender Model 3000 automatic dial-up function.

E

ETI

The *Enhanced Terminal Interface* (ETI) provides a user-friendly interface to configure individual Switch Cards in the Rack. The ETI is accessed through the COM A port (lower connectors) on the Switch Card being configured. The ETI menu is the default menu that appears after powering up the card and operates using VT100 terminal emulation.

F

Facility

Transmission facilities. Usually a two metallic pair set of cords, but can be telephone company carriers, T-1, microwave or dial-up telecommunications lines.

H

Hot Swap

The process of removing or installing Switch Cards from the Rack without turning off the Rack main power. The SMI updates the status of those Switch Cards that have been "hot swapped" to/from the Rack.

L

LED
Light-emitting diode. A semiconductor diode which emits light when a current is passed through it, indicating that the power is on.

O

On-premise Lines
Communication lines (usually twisted-pair) that are used to connect the ECS to the DEFINITY® ECS telephone.

P

PSTN
Public Switched Telephone Network. Refers to the local phone company.

R

RAS
Remote Access Server. A device used for sending and receiving data within a network environment.

Remote Module
The DEFINITY Extender 1101 or 2101 System that connects to the remote DEFINITY ECS telephone.

RS-232
9 Position Non-Synchronous Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange (ANS/EIA/TIA-574-90)

S

SMI
Switch Management Interface. A Windows based user interface providing complete configuration, troubleshooting and statistical capabilities for managing the complete Rack System.

SPID
Service Profile Identifier. An 8 to 12 digit number or label identifier assigned to an ISDN-BRI line which uniquely identifies specific features or parameters.

Switch Card

The DEFINITY Extender 3100 (Analog) or 3200 (ISDN) PCBs. These Cards are installed in the Rack for access by remote users to the DEFINITY ECS.

T

Twisted Pair
Two insulated copper wires twisted around each other to reduce interference from one wire to the other.

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