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

System Administrator's Guide

555-025-116
Comcode: 108373465
October 1998
Issue 1

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.

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Issue 1, October 1998

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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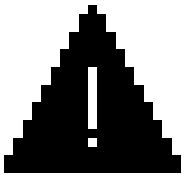

The exclamation point in an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

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

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 Model 3000 and Model 3100:

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 Model 3000 and Model 3100 , 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.

FCC Regulations

Lucent DEFINITY ® Extender Models 3000 and 3100 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 Model 3000 and Model 3100 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 Model 3000 and Model 3100 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 premise 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 Model 3000 and the Model 3100 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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Intended Audience

This manual is intended to help with the installation, configuration, and maintenance of the Lucent DEFINITY ® Extender Model 3000 and Model 3100. 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.

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 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 Analog 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

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, which 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.

Note: The Model 3200 ISDN Switch Card is not yet available.

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 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-premise location(s). Figure 1.1 below, illustrates a typical installation.

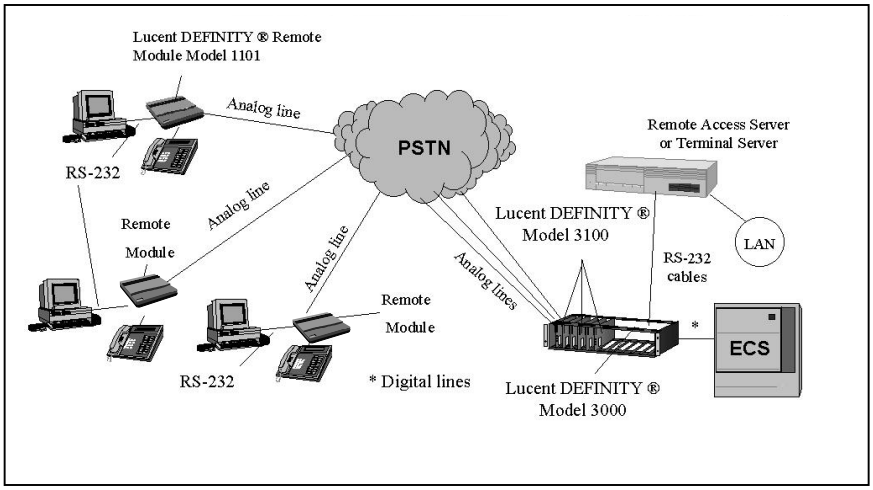

Figure 1.1. Typical Installation

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 120V power supply. The Rack accommodates up to 12 Switch Cards allowing 12 remote users (using Model 3100 Switch Cards) access to the system.

Phone line The Rack requires Switch Cards to be installed to provide voice and data connectivity using standard telephone lines.

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 The data connection acts as a simple null modem cable extending the corporate data network to the remote location. The backplane provides two data ports (COMA, COMB) per Switch Card, allowing connection to the corporate Remote Access Server or Terminal Server.

Example: The COM ports for the Switch Card in Rack slot 0 are labeled as follows:

- COM0A
- COM0B (only used with Model 3200 Switch Cards)

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 1-7 for more information

Note: Switch cards can also be configured individually by attaching a VT100 compatible terminal to COMA of each Switch Card.

DEFINITY ® Extender Model 3100 Card Description

Description

The Analog Switch Card is a PCB (Printed Circuit Board) 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.

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

C.O.D. Call on Demand: Can reduce long distance line cost's 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 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 to utilize all features of the Switch Management Interface.

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

Upgrade process for 3100 Switch Cards

The Switch Management Interface is used for upgrading the software for the Model 3100 Switch Cards. The administrator can upgrade a single card or multiple cards simultaneously.

Note: You can upgrade the Model 1101 Remote Module from the Switch Card over the analog connection. See Upgrading the Remote Module in Chapter 7 for more information.

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Specifications

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Chapter Contents

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

The Switch Cards within the Rack operate on a standard analog line. A minimum data rate of 14.4 Kbps is required for voice functionality. The recommended data rate is 19.2 Kbps. Contact the local telephone company for special conditioning if these rates cannot be maintained.

Transmission Line Conditions

The DEFINITY Extender Model 3000 and Model 3100 have been tested under transmission line conditions specified in TSB-37A. The specification calls for checking modem operation over the equivalent of 95% of the identified analog line types in North America. This means that the DEFINITY Extender Model 3000 and Model 3100 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.*

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	19”W x 5.25”H x 10”D (484mm x 133mm x 255mm)
Capacity	12 Switch Cards	
Number of users	12 (using DEFINITY ® Model 3100 Cards)	24 (using DEFINITY ® Model 3200 Cards), future use only.
Power Requirements	One internal 120V regulated power supply, which provides 12VDC and 5VDC.	5 Volts at 600 mA per interface card 12 Volts at 100 mA per interface card
User Data Port	RS-232	2 ports per card
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	120 VAC 60 Hz.	
Environmental Requirements	Ambient Temperature: 0 – 55 Degrees C Relative Humidity: 0 – 95%	Provide adequate ventilation.

Table 2-1. 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	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 2-2. Analog Switch Card Specifications

Rack Installation

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Chapter Contents

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

DEFINITY Extender Model ® 3000	❑ One twelve slot Rack mountable chassis ❑ One power cord ❑ One System Administrator's Guide ❑ Switch Management Interface software (2 disks)
DEFINITY Extender Model ® 3100 (sold separately from Rack	❑ One Analog 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 central office (CO) line at each remote module location.
- ❑ Each Switch Card will need a digital port (extension) from the DEFINITY ECS, and an analog line from the (CO) or 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, desksets and communication line cords are NOT supplied with this system.
- ❑ Use two-wire digital display phones only.

Customer Supplied Equipment

NOTE: *DEFINITY ECS telephones are not supplied with either the Switch Cards or the remote modules. These items must be ordered separately. Contact your Lucent Technologies representative for information.*

You must supply the following for installation:

- *DEFINITY ECS* two-wire, 24-port TN-2224 circuit pack or the older 16 port TN2181.
- Any additional DEFINITY ECS circuit packs needed (see the *DEFINITY Communications System Generic 3, Installation for Single-Carrier Cabinets* manual, document #555-230-894, comcode #107595423, for further information).
- An adapter to convert to 120 VAC if you are connecting the Rack to a 240 VAC outlet.
- 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

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
- ❑ 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)
- ❑ 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)

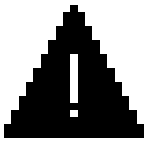
Electrical Requirements

The system has been designed to operate from 120 VAC 60 Hz. Power should not be applied to the Rack until specified in the installation procedures.

Phone Line Requirements

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

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 COM ports for all Switch Cards. Refer to Table 3-1, on the next page for connector descriptions.

Note: COMB ports are not used with Model 3100 Switch Cards.

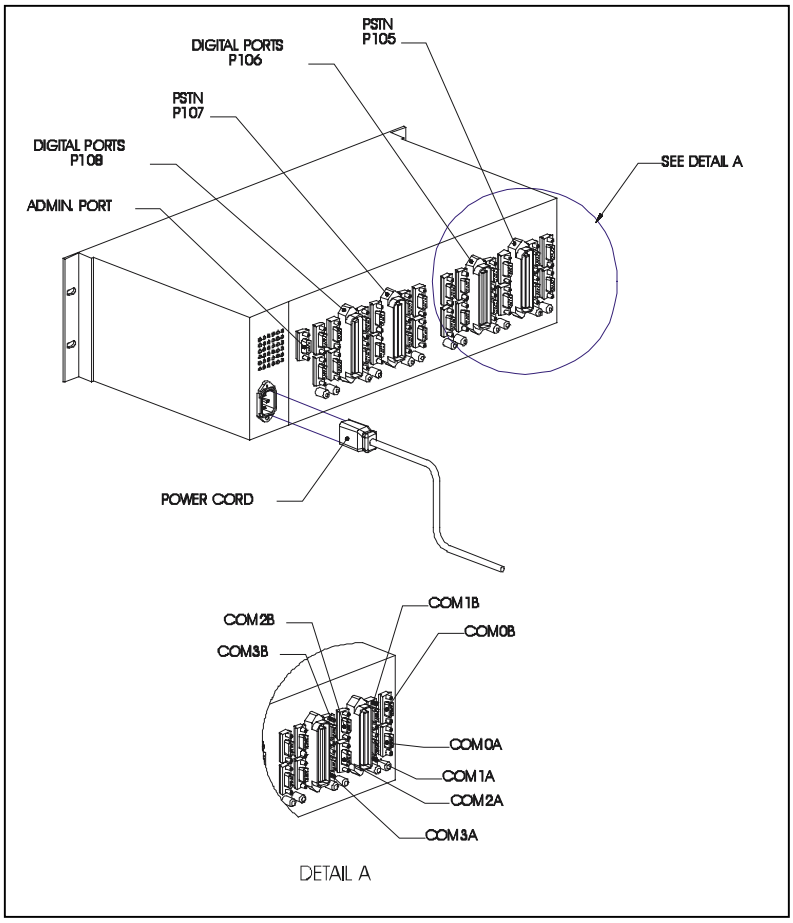


Figure 3. 1. Rack Backplane

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 (see Table 3-2, for pinouts and wiring details)	At the top of the 50 pin connector.
PSTN P105	50-pin male connector from PSTN to Switch Cards in slots 0-5 (see Table 3-4, for pinouts and wiring details)	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 (see Table 3-3, for pinouts and wiring details)	At the top of the 50 pin connector
PSTN P107	50-pin male connector from PSTN to Switch Cards in slots 6-11 (see Table 3-5, for pinouts and wiring details)	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.

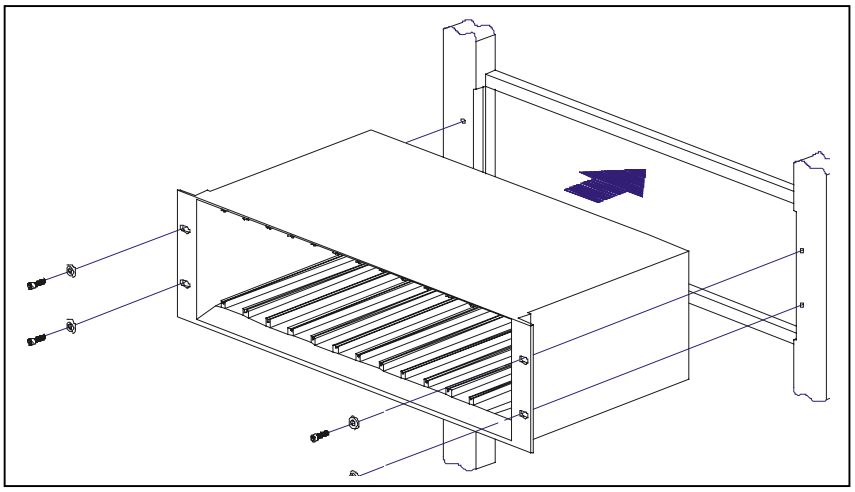


Figure 3.2. Rack Mounting

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.

Note: Only Port 1 is used for Model 3100 Analog Switch Cards. Port 2 (future use) is for Model 3200 ISDN Switch Cards which extends two digital ports per card for a maximum of 24 remote users per Rack.

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 future Model 3200 (ISDN Switch Cards) only.

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 future Model 3200 (ISDN Switch Cards) only

Connections from PSTN to backplane (slots 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 (slots 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 Each Switch Card installed in the Rack can be connected to the corporate LAN via a Remote Access Server or Terminal Server.

A standard RS-232 DB9 male connector plugs into the appropriate COMA port (COMB not used for Model 3100 Analog Cards) on the Rack backplane. Each Switch Card acts as a DCE. 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. (see Table 3-6 in this Chapter, for more detailed information about RS-232 DB-9 pinouts)

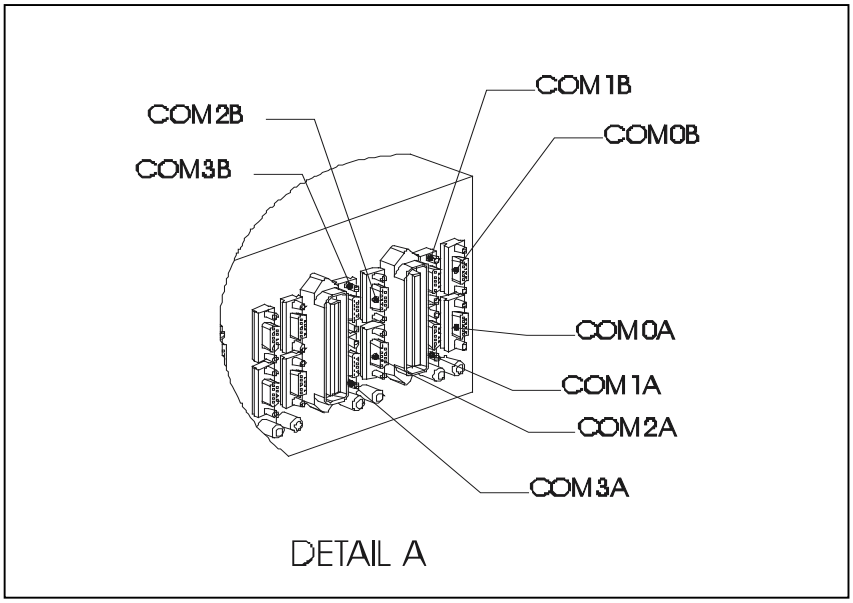


Figure 3.3. Data Port connectors (on the Rack Backplane)

How to connect the Cards to the Data Network continued

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

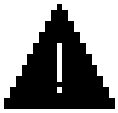
Introduction

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

Rack Checklist

- ❑ The Rack is secured properly.
- ❑ The power cord is connected.
- ❑ Rack position “Card 0” contains the latest Switch Card (Model 3100) loaded.
- ❑ 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

Installing Switch Cards

Introduction

This chapter explains the steps necessary to quickly install and configure new Model 3100 Switch Cards in the Rack.

Important Information

- When setting up the Rack for the first time, place the first 3100 Switch Card 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 Switch Card is equipped with a four position DIP switch, all of which should remain in the OFF position.

Note: If they are NOT all OFF, your Switch Card will not function properly.

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.

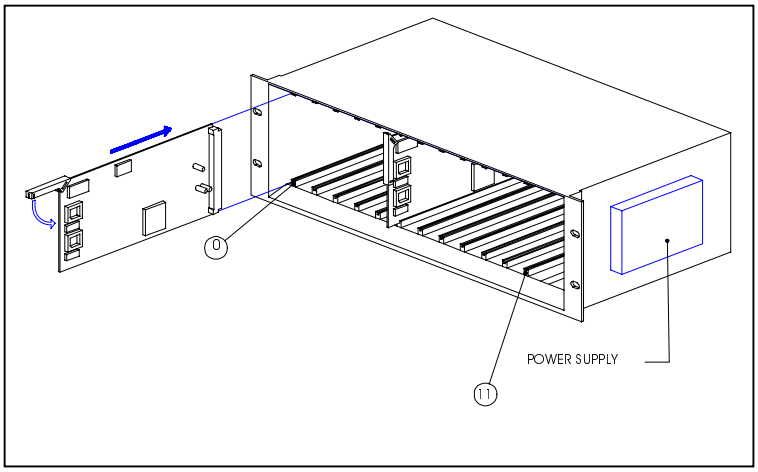

Figure 4.1. Sliding the Switch Card in the Rack.

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)

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Configuration

5

Chapter Contents

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 5-18)
- Configure the Card data port settings (page 5-28)
- Display card statistics (see Chapter 6)
- Review card diagnostics (see 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. Click on the **Settings** icon to select the PC's COM port to connect to the Rack (ADMIN port). (page 5-30 for more information)

3. Open or create a password file. A password file must be open to connect to the Rack. (see page 5-11 or page 5-12 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)

10. 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.

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

How to Configure the Remote Module

1. The 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 REM (remote) phone number along with the appropriate COD or Dialback options.

Note: See the Model 1101 Manual for details on configuring the remote module.

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 and the ability to configure, monitor and troubleshoot all Switch Cards in the Rack.

Required cable

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

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)

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 must match your PC's COM port settings. (see page 5-30)

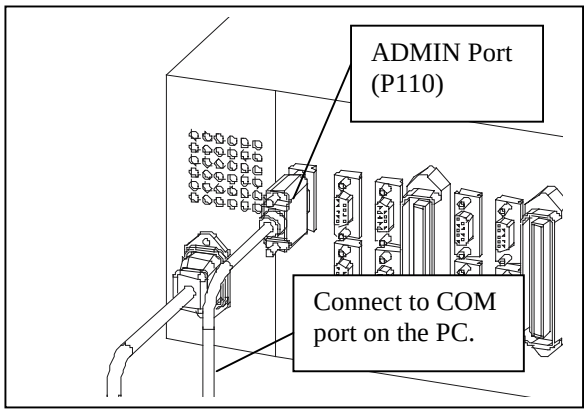

Figure 5.1. RS-232 Connection

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 and Windows NT 4.0. The software is provided on two floppy diskettes. Installation uses the standard Windows 95 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)

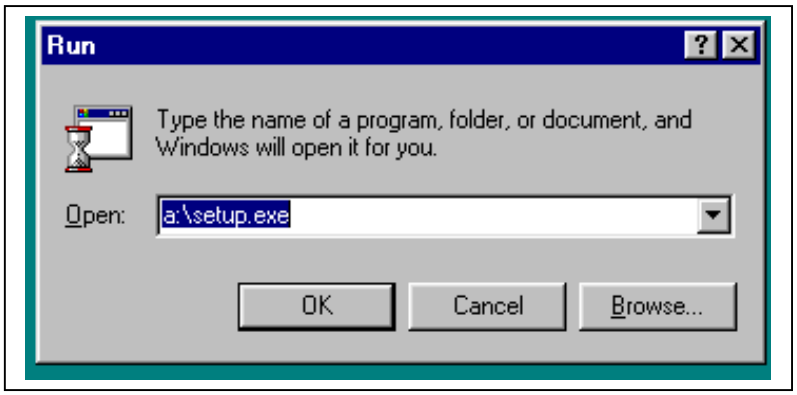

Figure 5.2. Select floppy drive

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)

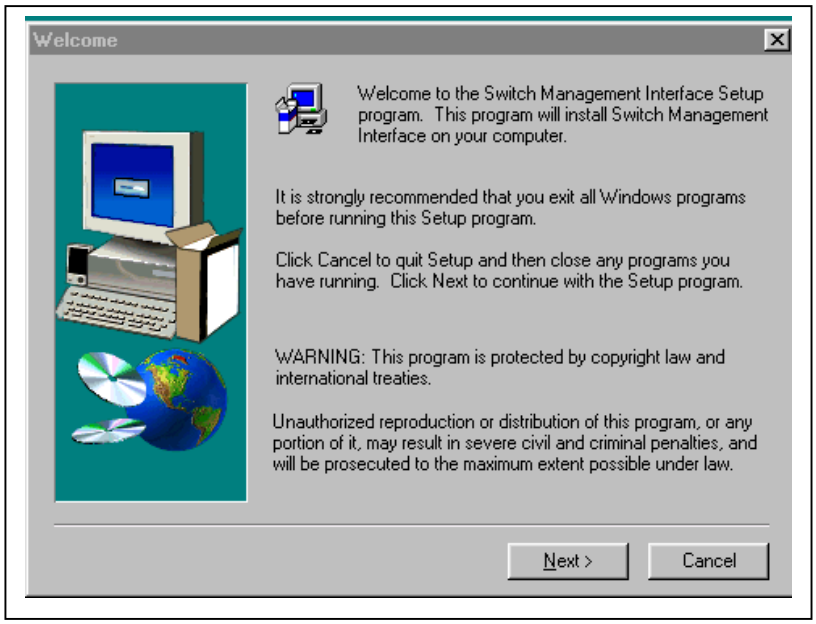

Figure 5.3. Welcome screen

How to install the Switch Management Interface
continued

6. Click **Next** at each screen.

7. The setup program will ask for disk 2 of 2. Insert disk two 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 diskette two 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)

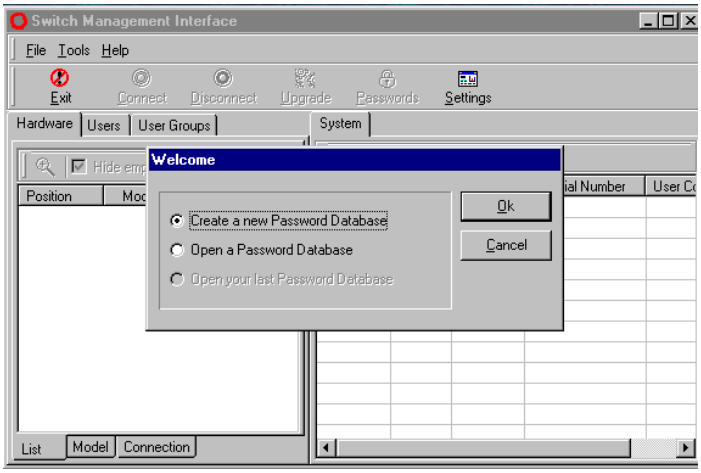

Figure 5.4. Startup screen

Password File Options

Select from three options:

- 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 active 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.

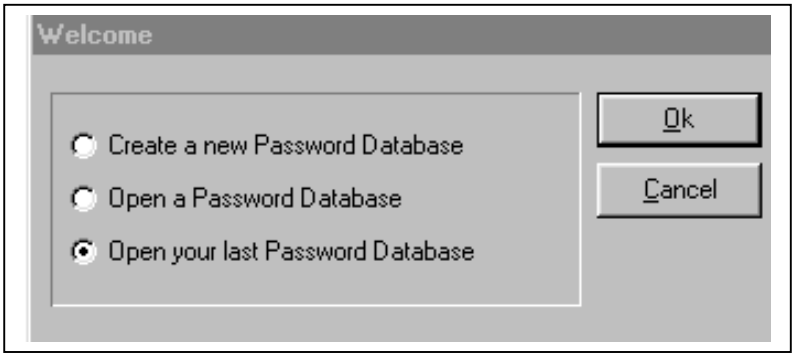

Figure 5.5. Options menu

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.

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) and type in a name for the new password file. (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.

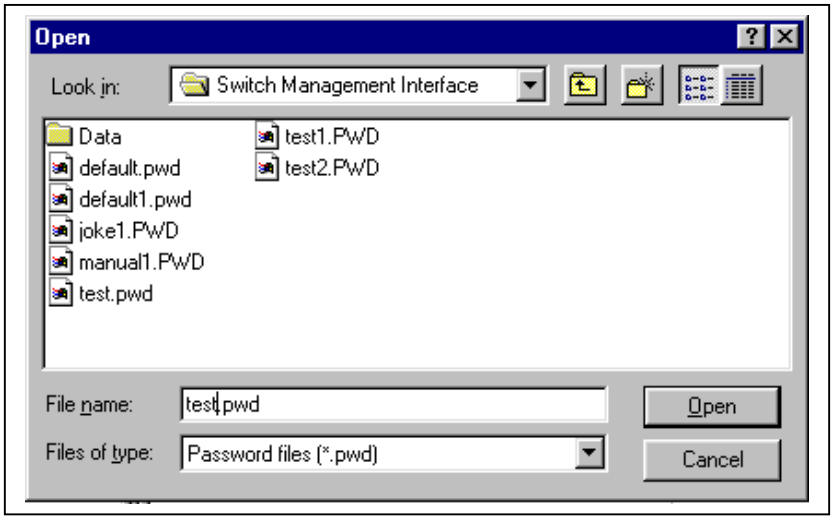

Figure 5.6. Opening or creating a password file

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", press "Disconnect" then "Connect".*

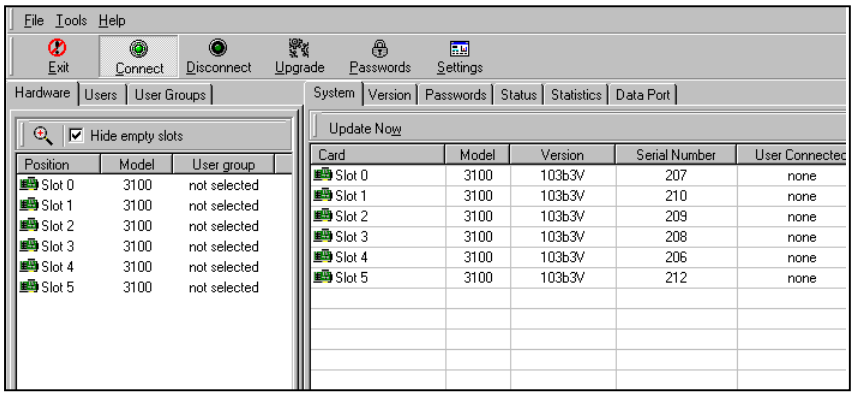

Figure 5.7. Initial card detection screen

Initial Card Detection continued

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

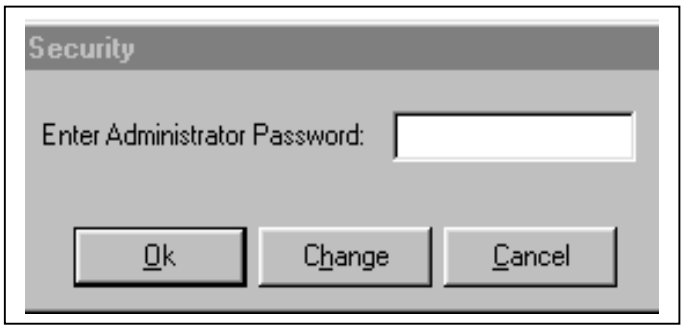

Figure 5.8. Administrator password screen

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 as this password also allows remote user access.*

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 ID's 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 6-33, 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:

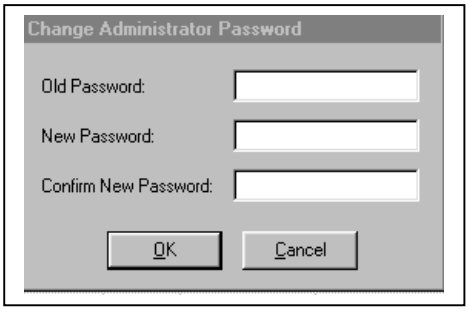

Figure 5.9. Change administrator password

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

Note: If you have forgotten the administrator password, see page 6-33, 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 ID's 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 ID's 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

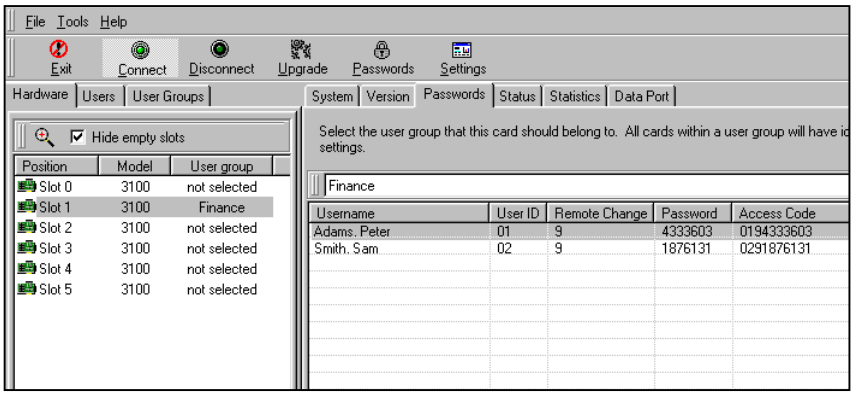

Figure 5.11. Access codes

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 User'.**

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 User '** 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 ID's 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. The right portion of the screen lists all available users within the database.

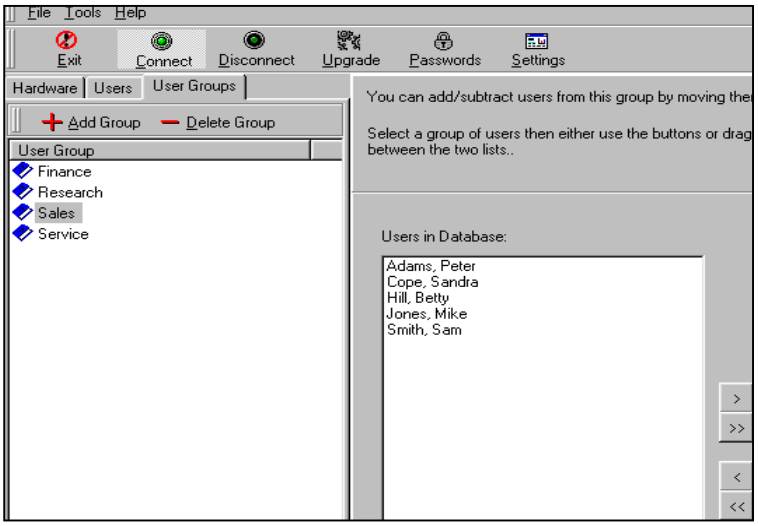

Figure 5.12. User group list

How to Create/Delete User Groups *continued*

2. To create a user group, click the **'+ Add Group'** 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 Group**' tab just above the user group listing. Confirm the delete by clicking **Yes .**

Note: A deleted user group cannot be recovered.

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)

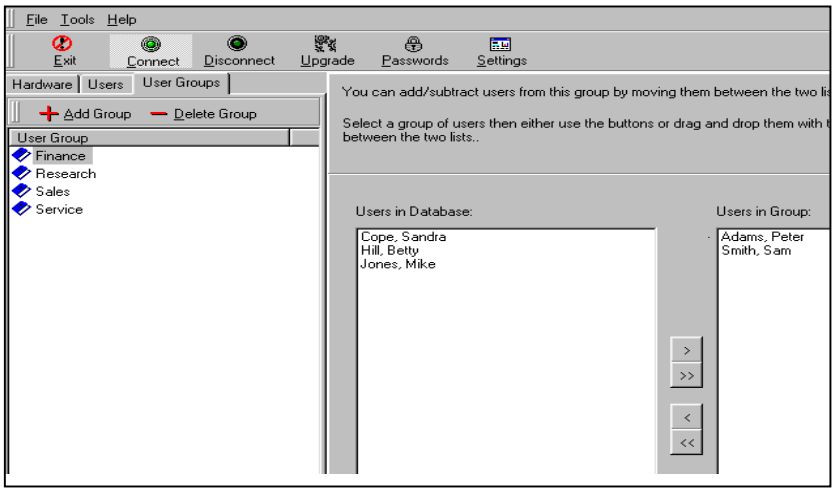

Figure 5.14. Add/Remove users from user groups

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 **Next**.

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

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

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

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 Assign User Groups to Cards *continued*

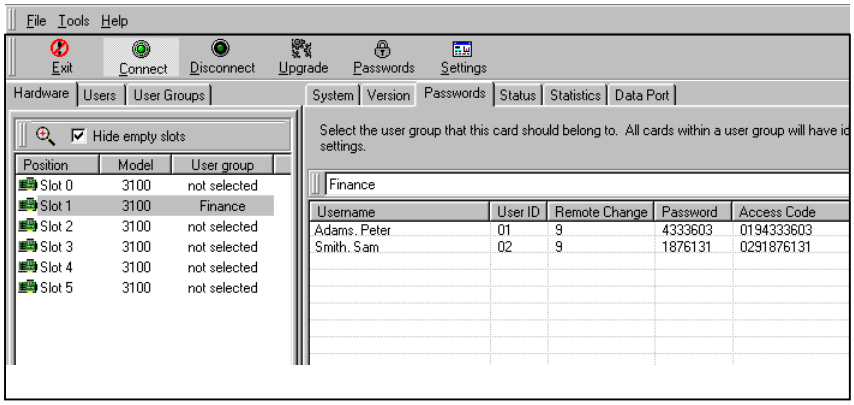

Figure 5.15. User Group information screen

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 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.*

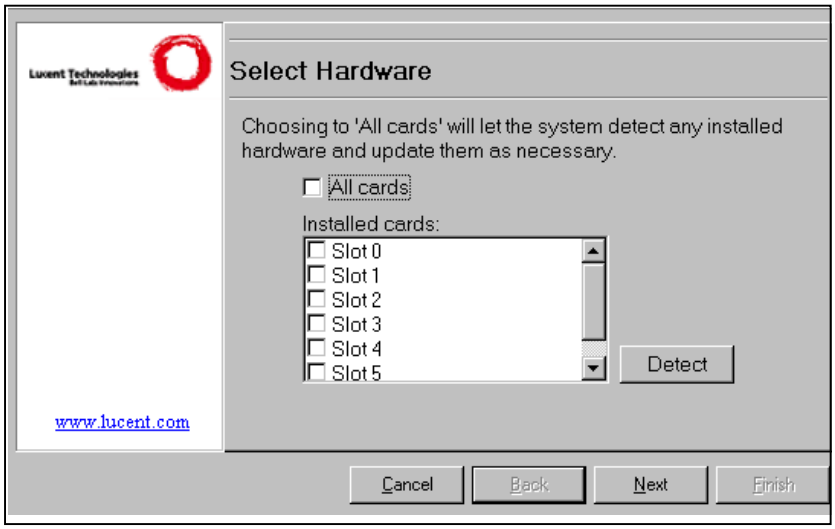

Figure 5.17. Card selection

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).

Note: The passwords actually 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

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 in Chapter 6.

How to set the Switch Card Data Port *continued*

4. Click **Apply**.

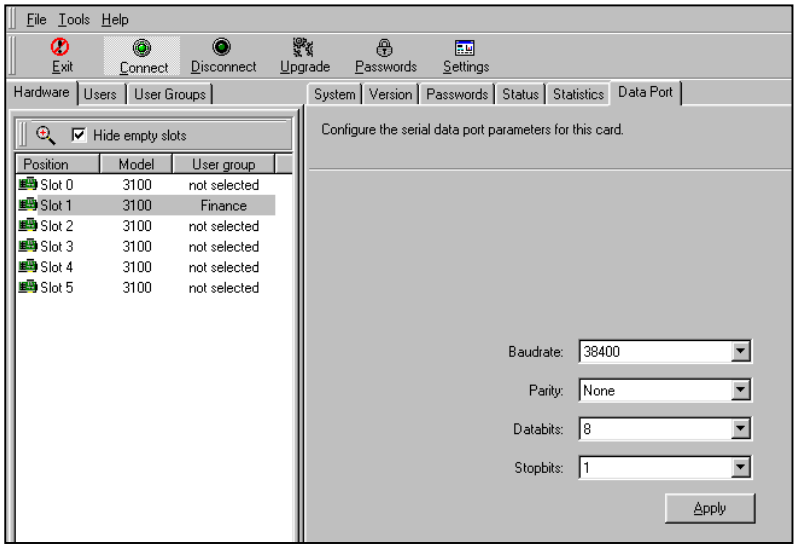

Figure 5.18. Data port settings

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** tab, 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**.

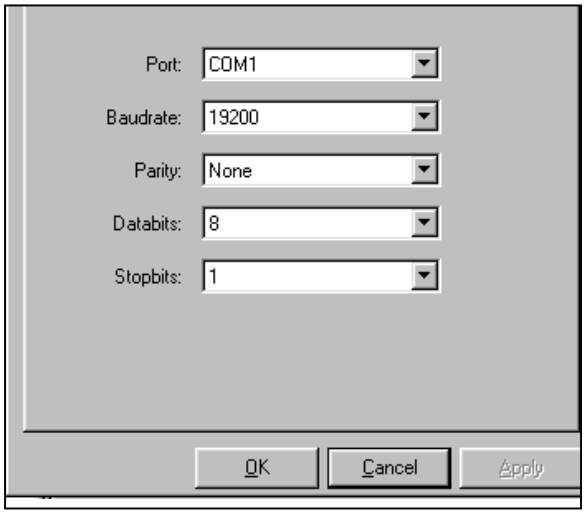

Figure 5.19. Settings Icon

How to Access the Rack through 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 either using the Switch Management Interface or 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.

4. The Switch Card status LED will blink as follows;

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

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

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

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.

   The Configure System Menu appears.

2. Select **Password** from the Configure System Menu, and press **ENTER**.

   The screen prompts for the administrator password.

3. 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 User ID, and press **ENTER**. (see page 5-17, for more information)

   A prompt to re-enter the new password appears.

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

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

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.

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Troubleshooting

6

Chapter Contents

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 two principal areas for troubleshooting:

1. How to identify problems using the built-in diagnostics of the Switch Cards and the Switch Management Interface.
2. How to troubleshoot specific functional problems.

Using built-in diagnostics

As with all equipment of a sophisticated nature, occasionally an error in connection or transmission may occur. Problems with the Rack and cards can be identified as follows:

- Using a simple baseline checklist (see page 6-3 in this Chapter)
- Using a series of troubleshooting tips (page 6-4 in this Chapter)

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 (page 6-19 in this Chapter)
- Connection problems (page 6-22 in this Chapter)
- Data connection problems (page 6-30 in this Chapter)
- Forgotten administrator's password (page 6-33 in this Chapter)

How to Identify Problems

When trying to identify problems with the Rack or cards, it is important to follow a structured method of troubleshooting to resolve the problem as soon as possible.

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.
- ❑ Verify that the analog line connected to the Telco line jack has dialtone.
- ❑ 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)

General Troubleshooting Tips

Step	Use the…..	For more information, Go to…… in this Chapter
1	Switch Card LED sequence	pages 6-5 to 6-8
2	Switch Management Interface Status menu information	page 6-9
3	Switch Management Interface “PBX flag” option	page 6-13
4	Switch Management Interface “Make Busy” option	page 6-13
5	Switch Management Interface Statistics menu information	page 6-15
6	Error codes	pages 6-16 to 6-18

LED Light Sequences

When a Switch Card is inserted into the Rack, the card displays a sequence of LED lights. The proper startup sequence includes a set of fast red blinks, followed by 3 green blinks, 4 yellow blinks, followed by 3 sets of 8 yellow blinks. 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	6-5
2	6-6
3	6-7
4	6-8

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 set busy) (see page 6-13)
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.
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. Refer to the ECS documentation for maximum cable length.

Table 6-2. Blink 2

Blink 3	Green	Yellow	Red
Meaning	Card is operational, and modem has previously connected.	Card is operational, but modem has never connected.	Modem error with Switch Card. Potential hardware fault.
Action	None	Try to connect to the Switch Card with remote module.	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.

Table 6-3. Blink 3

Blink 4	Green	Yellow	Red
Meaning	Card has detected a ring and received an incoming call. Has not necessarily actually connected.	Card is operational, but has never detected a ring or received an incoming call.	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 ID's associated with the abnormal disconnects.)
Action	None	Try to simply 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.	Open the Switch Management Interface and check for the following: 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 6-26)

Table 6-4. Blink 4

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.

Status Information

The status information available includes:

- Up time
- User
- Login Failures
- Never connected
- Ring detected
- Disconnects
- DSP
- Connection
- Signaling

Flags

(see page 6-13)

- PBX Flag
- Make Busy

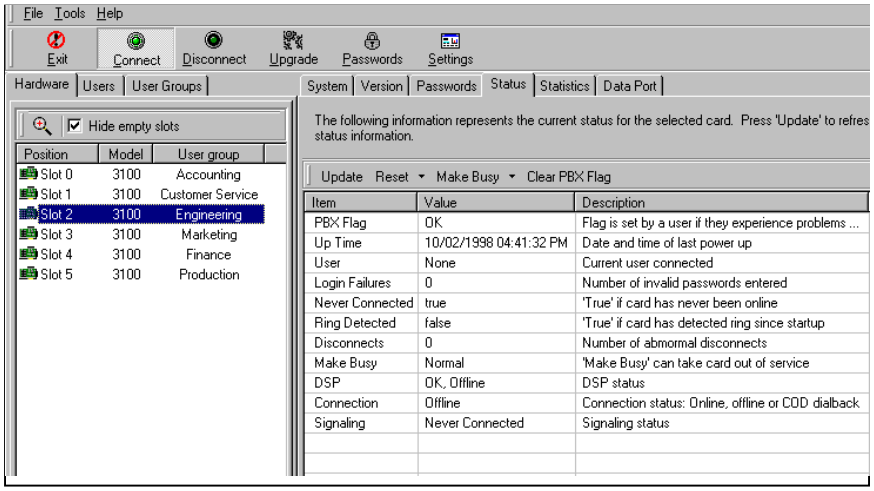

Figure 6.1. Status screen

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:

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. Reset the* card *if 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.
Signaling	Signaling status	**OK:** none **Error:** ❑ Reset 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.

Table 6-5. Status definitions

Status Menu Information continued

Item	Description	Action Required
Disconnects	Normally when the units go offline, a disconnect message is sent and this counter increments.	Go to page 6-27 for required action.
DSP	DSP Status, OK, Offline	**OK:** none **Offline:** The digital port is not being recognized. ❑ Check wiring to the System ❑ Ensure the digital port is enabled on the DEFINITY ECS. ❑ Check for damaged port hardware on the card. ❑ Move the card to a known working slot position to verify it is the wiring and not the card itself.
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

Table 6-6. Status definitions

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.
Connection	Connect status, Online, Offline or COD dialback	None

Table 6-7. Status definitions

PBX Flag/Make Busy options

Item	Description	Action Required
PBX Flag	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 on the modem. **Off Hook:** ❑ 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 6-8. Flag definitions

Status Menu Information continued

There are four 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	Sets the 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.

Table 6-9. Flag reset options

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 3100 card or a remote user's Extender.

How a Remote User "Flags" a bad Switch Card

When the Remote user is online (connected) with a faulty Switch Module, 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 which has problems.

Statistics Menu Information

Introduction The Switch Management Interface allows the administrator to obtain detail status information on a specific Switch Card in the Rack. If there are any problems with the card or the connection, the status menu will display the error by incrementing the **Value** field for the specific error code. The **Value** 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: **Code** (see Figure 6.2 below), **Value**, and **Description**

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

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

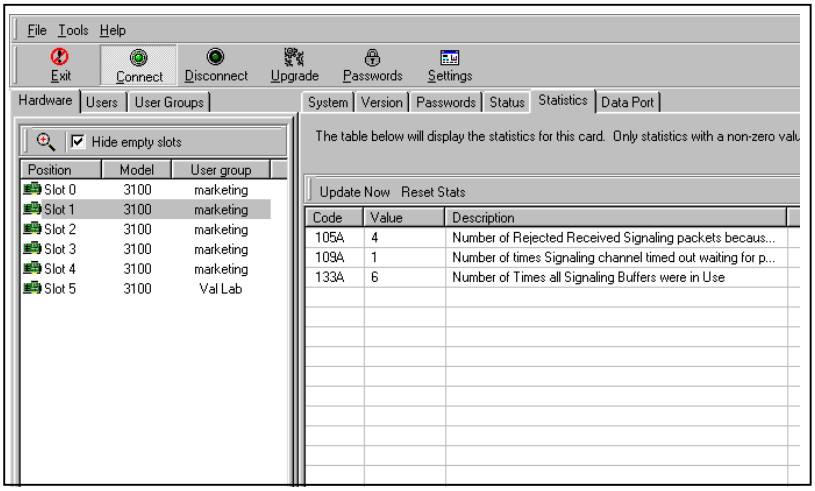

Figure 6.2. Statistics menu

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**
104A	Number of received modem packets that contained an invalid V42 address.	
105A	Number of rejected received modem 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).	Information was sent to the DEFINITY ECS more than the acceptable number of times.
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, analogue line may have disconnected.
110C	Number of times signaling channel transmit locked up (transmit buffers full when no data to send).	

Table 6-10. Error Codes 104A to 110C

Error Codes *continued*

Error Codes		
Error Code	**Description**	**Cause**
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.	
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**.
124C	Number of times Synchronous Communications Controller IC transmit locked up.	

Table 6-11. Error Codes 111A to 124C

Error Codes continued

Error Codes		
Error Code	**Description**	**Cause**
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.
136A	Serial transmit buffers overflow to modem	
137A	Serial receive buffers overflow to modem.	
138B	V42 RX Timeout - Modem Retrain	Modem had to re-train (reconnect), possible power outage on Switch Card.

Table 6-12. Error Codes 125B to 138B

How to Troubleshoot Audio Problems

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 6-16 to 6-18 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.

How to Troubleshoot Audio Problems *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 6-16 to 6-18 for a detailed description of error codes. These errors are frequently caused by analog line problems. Try swapping out the analog line or have the user connect at a lower connect rate.

How to Troubleshoot Audio Problems 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 hit 4 **Hold** keys to go to the **Disconnect** menu. Then they simply press 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. See page 6-13 for more details.

How to Troubleshoot Connection Problems

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 6-13. Connect Error /No dialtone

How to Troubleshoot Connection Problems 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. It will blink yellow, green, yellow, yellow once it has restarted. Attempt to connect the remote module. If it fails, observe the LED sequence on the Switch Card. Yellow, green, yellow, yellow means that it has not received a call and the remote module **PBX Phone Number** is wrong. Yellow, green, green, yellow means that the Switch Card received a call, but the modems could not negotiate a connection. Lower the connect rate on the remote module. Yellow, green, green, green means that the modems did negotiate properly and the failure is not related to "No Carrier."

Table 6-14. Connect Error/No Carrier

How to Troubleshoot Connection Problems 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 it 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 6-16 to 6-18.

Table 6-15. Connect Error/V42 Connect Error

How to Troubleshoot Connection Problems 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 page 5-26 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 6-16 to 6-18. *NOTE: Lost data packets prevent the password from being sent or received properly. Try lowering the 'Connect Rate" on the remote module.*

Table 6-16. Connect Error/ Password Not Verified

How to Troubleshoot Connection Problems continued

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

Procedure

1. From the Switch Management Interface, click the **Hardware** tab, select the Switch Card, and click the **Status** tab.

Note: This will display exactly how many "Abnormal Disconnects" have occurred on this card since it has been powered up.

2. If these are excessive, check other cards to determine if all units are experiencing this problem.

3. In addition, check the LED sequence on all 3100 Switch Cards.

Note: Whenever the 4th and final blink of the sequence is RED, the card has received at least two consecutive abnormal disconnects.

4. Check the last four abnormal disconnects. See Table 6-17 on the next page, with the possible causes and action required.

*Note: At the bottom of the **Status** tab for each Switch Card, you will notice the **"Abnormal call disconnect status"** table. This will display the time and the reason for the last four abnormal disconnects.*

How to Troubleshoot Connection Problems *continued*

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

Reason for Disconnect	Possible Cause	Action
Lost Carrier	Either the modems dropped the line due to errors, or the remote module dropped the analog phone line or digital terminal.	Check the **Statistics** tab to view any unusual or excessive errors and refer to tables on pages 6-16 to 6-18. 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 on the remote module appears to have been disconnected. Disable specific features, such as call waiting, on the remote modules analog line.

Table 6-17. Unexpected Disconnect/Lost Carrier

How to Troubleshoot Connection Problems continued

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

Reason for Disconnect	Possible Cause	Action
Lost V42	Analog line on the Switch Card has been lost or data packets have been dropped between the modems.	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.
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 6-18. Unexpected Disconnect/Lost V42, Lost Signal

How to Troubleshoot Connection Problems continued

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 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 6-18 for more information on troubleshooting these sorts of problems.

How to Troubleshoot Data Connection Problems

Symptom: Cannot connect PC or terminal to data network

Action: Users that 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.

How to Troubleshoot Data Connection Problems

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.

How to Troubleshoot Data Connection Problems
continued

Symptom: Not satisfied with data performance

Action:

Optimally, the DEFINITY Extender 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.*

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.

4. The Switch Card status LED will blink as follows;

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

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

6. Select **Configure System**.

7. Select **Passwords**.

8. From the prompt *Enter administrator password,* type **Reset**.

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

10. Select **Exit**.

Note: This procedure will erase all passwords on Card "0", and reset the administrator password to 000000, which cannot be used by the Switch Management Interface.

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Software Upgrades

7

Chapter Contents

Software Upgrades

Introduction This chapter will explain how to upgrade the software contained within the Flash ROM on the Switch Cards. It is important to run the most recent version of software.

How to check the software revisions of cards

Procedure

1. Click **Hardware** to list all cards in the Rack.

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

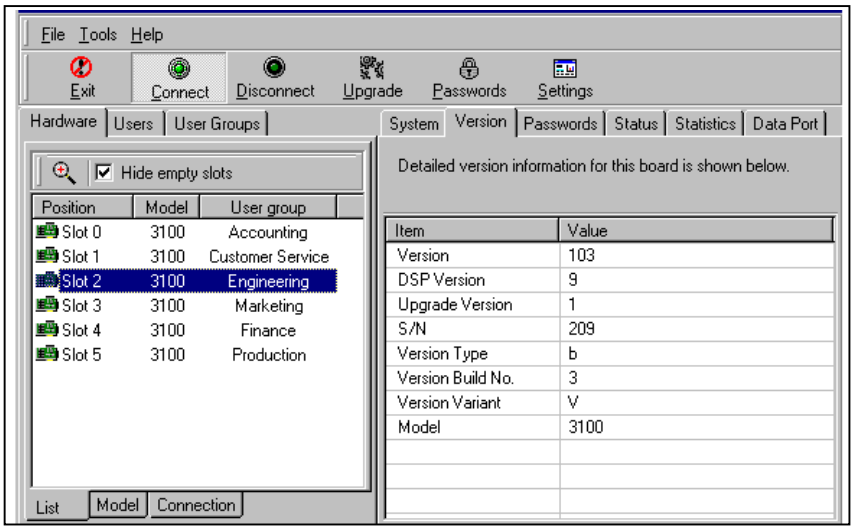

Figure 7.1. Card version information

How to Upgrade Switch Card Software

Procedure

1. Click **Upgrade** icon and click **Next**.

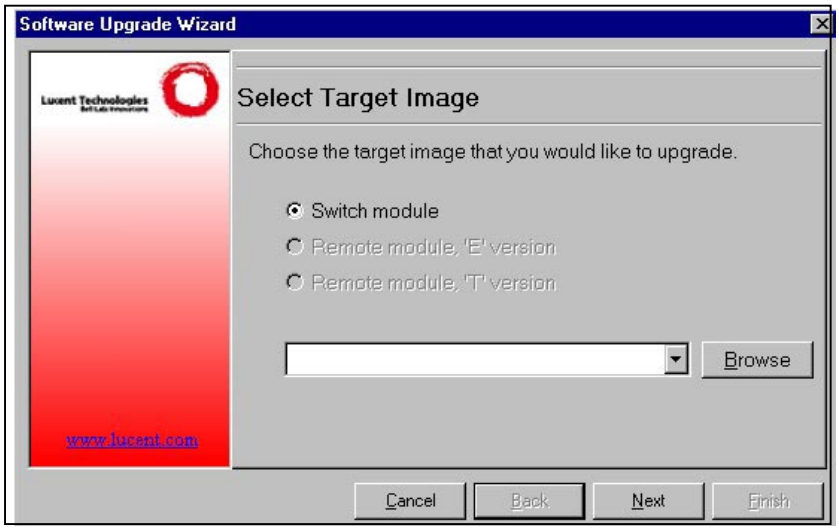

Figure 7.2. Select target image

2. Click **Browse** to locate the file containing the latest software revision.

How to Upgrade Switch Card Software *continued*

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

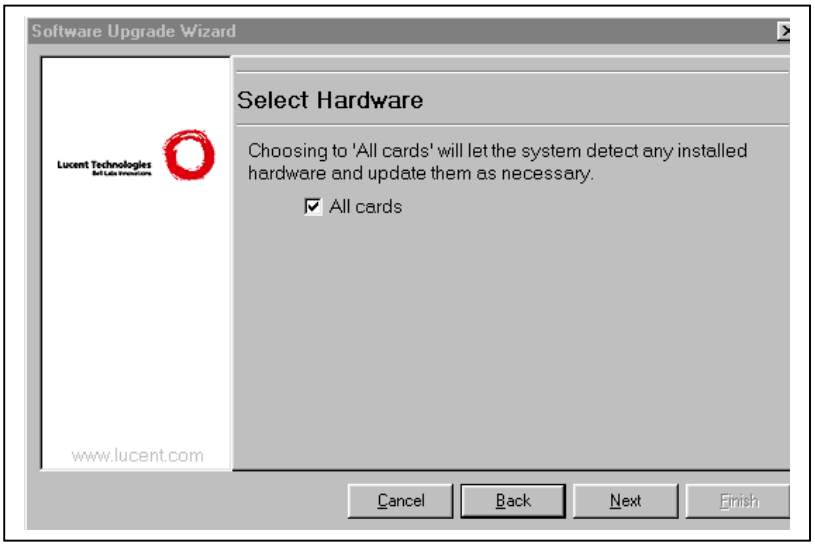

Figure 7.3. Select hardware

How to Upgrade Switch Card Software *continued*

4. Click the box next to the card(s) to be upgraded.

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

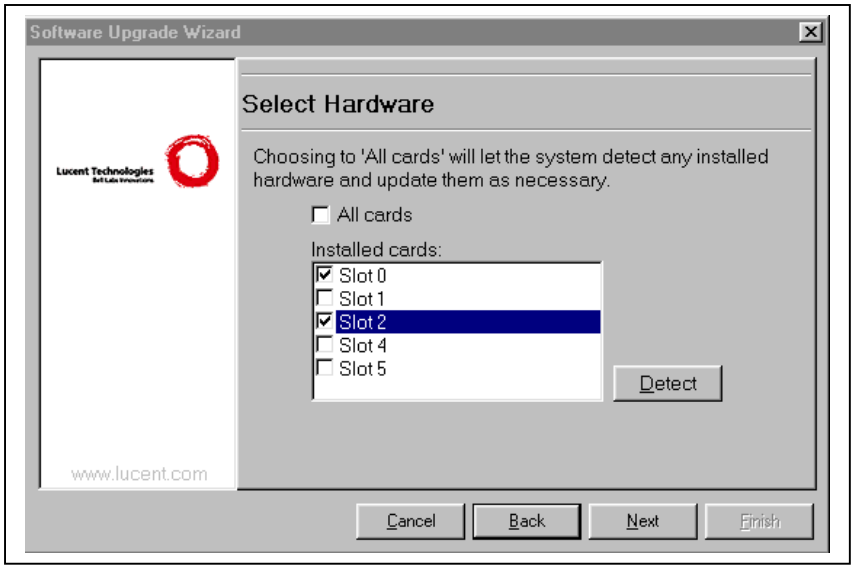

Figure 7.4. Card selection

How to Upgrade Switch Card Software continued

5. Click **Next** to begin. The wizard displays the progress of the download.

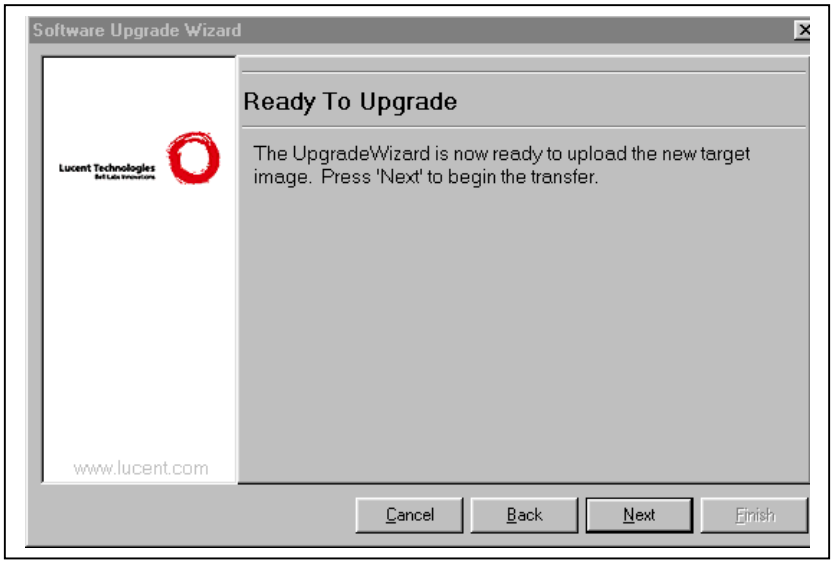

Figure 7.5. Ready to upgrade

6. The upgrade process will finish and the screen displays the upgrade status for each Switch Card.

7. Click **Next.**

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

9. 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.*

How to Upgrade Software Using a Terminal program

Introduction

This upgrade process applies to both the Switch Card and remote modules and should take place when both are offline. This procedure only covers the Switch Card software upgrade instructions. Information for upgrading remote modules is found on page 7-10.

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.

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

Procedure

From the Main Menu:

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

From the System Menu:

2. Select ***Software Upgrade***. The command will initiate the upgrade process.

How to Upgrade Software Using a Terminal Program
continued

Procedure 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.

3. 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...

4. 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.

The module then displays the following message:

Starting upload, have received and written up to line...
100
200

How to Upgrade Software Using a Terminal Program
continued

Procedure

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.

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

Upgrading the Remote Module

Introduction

This chapter explains how to perform a software upgrade on the remote module from the Switch Card.

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.

   Note: If this prompt does not appear, the remote module is already running the same version software.

5. Press **OK or 2** to start the remote module software upgrade.

The LCD displays:

Are You Sure?

6. Press **OK or 2** to start.
7. 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 Switch 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

Glossary

+12 vdc
: 12 volt direct current.

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

B

Baud Rate
: The speed in Kbps at which digital data can be transmitted.

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.

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.

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.

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.

R

Remote Module
: The DEFINITY Extender 1101 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

Switch Module

The DEFINITY Extender 1100 System that connects to the DEFINITY ECS.