Lucent Technologies
Bell Labs Innovations

ISDN DEFINITY® Extender
Models 2300EU and 2100EU

System Administrator's Guide

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Ordering Information
For more information about Lucent Technologies documents, refer to the section entitled "Related Documents" in "About this Guide."
Outside the USA, if you need assistance when installing, programming, or using your system, contact your Lucent Technologies authorized representative.

Support Telephone Number
Contact your local Lucent Technologies representative.

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About This Guide

Introduction

The ISDN DEFINITY® Extender 2300EU/2100EU System Administrator's Guide provides you with information to:

- Install
- Configure
- Operate
- Troubleshoot

Prerequisite

This manual was written with the assumption that you possess a working knowledge of Lucent digital phones and the DEFINITY® Enterprise Communications System (ECS).

Should you require further information on how the phone or ECS works, we suggest you either consult your Lucent Technologies system administrator, or read the user documentation provided with your phone system.

Product Overview

Introduction

The Lucent Extender series provides remote workers and small branch offices seamless connectivity to the DEFINITY® ECS in addition to the corporate LAN.

Remote employees can: place and receive calls through the ECS; use three-digit internal dialing; transfer calls; set up conference calls; have a corporate-based receptionist screen calls; access the voice mail, auto-attendant or any other software residing on the ECS. Extenders work with existing corporate, digital telephone sets, but there are restrictions to telephone use at residential locations. Transmission is over the public telephone network using ISDN, or BRI lines.

A Switch Module and a Remote Module are all that is needed to provide an off-premise employee with full voice and data communications functionality.

Product Family

The ISDN DEFINITY® Extender, Models 2300EU and 2100EU, extends a DEFINITY® ECS to a remote site by using a Switch and a Remote Module, over one ISDN B-channel.

The connection to the ISDN network is done via the built-in S/T interface. The Switch Module connects to a digital port on the ECS located at the corporate office, and the Remote Module connects to a Lucent digital phone set at a remote location.

The ISDN DEFINITY® Extender, Models 2300EU and 2100EU, includes MCK's Interactive Voice Protocol™ software. The software packetizes, compresses, and encrypts voice and ECS signals to condition them for transmission over a public, circuit-switched network.

Product Family *cont'd*

Other features of the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, include: an available analog port* and an RS232 terminal connection, depending on the model ordered.

*Note: Analog port available on the Remote Module only.

How the Connection Works

The Switch Module and the Remote Module communicate by transmitting signals across a single ISDN B channel. The B channel establishes a 64 Kbps digital link.

The second B channel will have one of the following capabilities, depending on the model you have:

2300EU – Analog Port*
2100EU – Analog Port* & RS232 Terminal Adapter

*Note: The Analog Port is only available on the Remote Module.

Speech is compressed to 32 Kbits ADPCM format and is combined with the telephone signaling data and COM port data for 2300EU. Once the installation has been completed, your Remote Module will enable your remotely located Lucent phone to function exactly like your deskset at the office.

For instructions about using a Lucent phone, refer to the documentation provided with your phone.

Compatbility

The DEFINITY Extender is compatible with the following commercial two-wire DEFINITY ECS display telephones.

- 6408D + (This display telephone is certified for residential use.)
- 6416D+ (This display telephone is certified for residential use.)
- 6424D+ (This display telephone is certified for residential use.)
- 8410D
- 8410DR (This display telephone is certified for residential use.)
- 8434D (Requires a separate power supply.)

NOTE:
The power supply that comes with the ISDN Remote Module cannot produce the power required by the 8434D telephone. An MSP-1 (WP924644) power supply must be used. Check with your Lucent Technologies representative for ordering information.

- 603 E Callmaster III®
- 603F1 Callmaster IV®
- Callmaster VI® (This PC-based product is certified for residential use.)

NOTE:
For residential installations, FCC regulations prohibit use of telephones not certified for residential use.

Checklists

Introduction

Before continuing with the installation and configuring of your Switch Module, please go through the following checklists.

Switch Module Checklist

Your ISDN DEFINITY® Extender, Models 2300EU and 2100EU, Switch Module package should contain:

- ❑ One ISDN DEFINITY® Extender, Models 2300EU and 2100EU, Switch Module.
- ❑ One ISDN DEFINITY® Extender, Models 2300EU and 2100EU, System Administrator's Guide.
- ❑ One 220 or 240 volt AC adapter.
- ❑ One RJ45 line cord.

The following services should be installed and tested before proceeding:

- ❒ DEFINITY® ECS digital port.
- ❒ DEFINITY® ECS BRI port or ISDN line, as described in the ISDN line checklist.

Parts required to configure the Switch Module, but NOT included with the system:

- ❒ PC or terminal with a terminal emulation package (must be VT100 compatible).
- ❒ RS232 serial cable. (Male DB9 connector required to connect to the Switch Module. The other connector should match to the PC or terminal.)
- ❒ RJ45 cable.

ISDN Line Checklist

The recommended ISDN line provisioning is:

- ❒ ETSI Net 3 with 2 DNs and Auto TEI type.
- ❒ Circuit Switched Voice and Data on both B channels (B1 and B2).
- ❒ No call features are required on any B channels.
- ❒ Must be capable of 56K or 64k Synchronous Data Calls, Clear Channel

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

- ❑ Ensure you have the proper ISDN line installed at the switch site.
- ❑ Ensure you know the DN numbers and TEI type. You obtain this information from your local ISDN service provider when the ISDN lines are installed.
- ❑ Ensure that you have registered the ISDN lines with your long distance carrier for ISDN DATA Service, if required.

PC or Network Connection

If you are connecting ISDN DEFINITY® Extender, Models 2300EU and 2100EU, Switch Module to a PC or network , you will require:

For the model 2300EU or 2100EU:

- ❒ One serial cable with a male DB9 cable end.

Checklists

Environment Checklist

The installation area should be:

- ❑ Well ventilated and free of dust.
- ❑ Have an ambient temperature of 0ºC (32ºF) to 55ºC (131ºF), with a relative humidity below 95%.
- ❑ Free of any large electrical equipment such as copiers or motors that generate electromagnetic, radio frequency, and electrostatic interference.
- ❑ Within 150 meters (500 feet) of the DEFINITY® ECS.

Electrical Checklist

The AC electrical requirement for the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, is:

- ❑ 12 volt DC unregulated supplied by 220 or 240 Volt adapters.

Quick Configuration

Introduction

This section provides step-by-step procedures to configure your Switch Module.

Configuring and Installing the Switch Module

Ensure that you have the Switch Module (module is labeled 'Switch Module' on the cover) before proceeding.

To configure and connect your ISDN DEFINITY® Extender, Models 2300EU and 2100EU, see Figure 1:

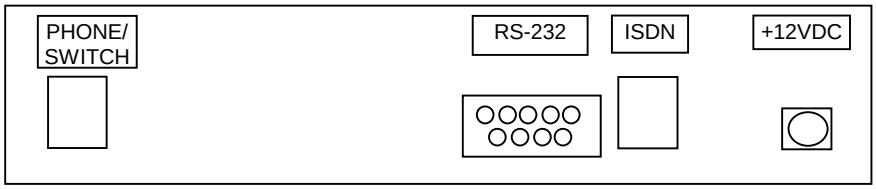

Figure 1. Switch Module Back Panel

1. Plug the Switch Module port (labeled *PHONE/SWITCH* on the Module back plane) into the DEFINITY® ECS using the RJ45 cable.
2. Plug the Switch Module ISDN interface (labeled *ISDN)* into the ISDN line provided by the DEFINITY® ECS or your service provider using the RJ45 cable.
3. Plug the male DB9 end of the RS232 cable into the Switch Module connector (labeled *RS232)* and the other end of the RS232 cable into a PC running a terminal emulation program or a terminal.

Continued on the next page…

Configuring And Installing The Switch Module *cont'd*

The RS232 parameters default at 9600 bps, 8 data bits, 1 stop bit, and no parity and use VT100 terminal emulation mode.

4. Plug in the 220/240 volt AC adapter provided with the Switch Module.

   The Module's LED will start flashing and performing the power-up test.

   The Module's LED will perform a series of yellow, green and red blinks. After 10 seconds of very fast red blinking, the LED will blink green three times and red once. The LED will then blink 3 sets of 8 yellow flashes.

   NOTE: You can only access the menu on power up.

5. During this yellow flash sequence type the word *MENU*.

After you have entered the command, the *Switch Configuration* menu will appear on the terminal program.

6. Select *Configure ISDN* to configure the following ISDN parameters:

   - The ISDN network switch type. Currently only ETSI NET 3 is available.
   - The DN1 and DN2 numbers for the Switch ISDN line.
   - TEI type (auto, fixed).
   - TEI1 if fixed TEI type was selected.

Continued on the next page…

Configuring And Installing The Switch Module *cont'd*

These parameters must be supplied by the ISDN service provider that installed your ISDN line. If no TEI information was supplied, use the auto TEI mode.

7. Write down the Switch DN1 number to use later when programming the Remote Module. This DN1 number will be entered in the Remote Module under the menu *Set PBX Number*.

   If you are using the Switch Module for your data connection, write down the DN2 number. You will need it to program your remote data equipment.

8. After the ISDN parameters are entered, exit the *Configure ISDN* menu.
   You will be prompted to save the new ISDN parameters.

9. Select Yes. The Switch Module will initialize to the ISDN network at this time.
   Access the *Configure System* menu from the Main menu.

10. Set *Passwords*, if required.
11. Set the *COM* port, if required.
12. Set *ISDN Connect Rate*, if required.
13. Select the *Show Settings* menu to confirm all parameters were entered correctly.
14. Select *Exit*.
15. Select *Exit* again to end the programming session.

Verifying Configuration

To verify that the ISDN parameters were stored correctly, you must power-down and power-up the Switch Module. See steps below.

Powering Up/ Down

NOTE: Before powering-down the Switch Module, ensure that you are offline.

1. Unplug the AC adapter from the back of the Switch Module.
2. Disconnect the ISDN line and ECS digital port.
3. Reconnect the ISDN line and ECS digital port.
4. Plug the AC adapter to the back of the Switch Module.

After the powering-up, your Switch Module LED should blink a three green flash sequence, indicating it is now configured.

Configuring Using a Terminal

Introduction

The Switch Module can only be programmed using a terminal.

The following Switch Module parameters require programming using a PC:

- ISDN Parameters – Switch Type, DN, and TEI.

The following Switch Module parameters are optional but also require programming using a PC:

- COM Port – Data Rate, Parity, Data Bits, Stop Bits. (Optional)

For the 2300EU, the COM Port settings are for the serial data connection that shares the first B channel. For the 2100EU the COM Port settings are for the RS232 data port that uses the second B channel.

Requirements

When configuring the Switch Module, ensure the PC or terminal has its communications parameters set to:

- 9600 BPS
- No parity
- 8 bits
- 1 stop bit

The Switch Module must be connected to the PC or terminal using an RS232 serial cable, which connects to the RS232 port on the module. Your terminal application should be configured for VT100 emulation.

The ETI and TTI Menus

The *Enhanced Terminal Interface* (ETI) and *the Text Terminal Interface* (TTI) provides you with are user-friendly interface with which to configure your system when accessing the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, through the RS232 port.

The ETI menu is the default menu that appears after powering up your module and operates using VT100 terminal emulation. If your PC doesn't have VT100 terminal emulation, you need to use the TTI menu, which is accessed after the ETI menu displays. The ETI menu will be unrecognizable, but you still access the TTI menu from this point.

Accessing the ETI/TTI Menu

To access either configuration menu:

1. Plug in the Switch Module's RS232 serial port to a PC with a terminal application.

When the Switch Module is powered-up, the module will undergo hardware tests demonstrated by a series of yellow, green and red blinks. After a 10 second period of very fast red blinks, the LED will blink three green flashes and one red flash. The LED will then blink 3 sets of 8 yellow flashes.

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Accessing the ETI/TTI Menu *cont'd*

2. Type "Menu"

The ETI menu will be displayed.

3. Press *CTRL T* to access the TTI menu.
4. Pressing *CTRL T* again to return to ETI.

NOTE: You can access the TTI menu at any time by pressing *CTRL T*.

Terminal Edit Line

The *Terminal Edit Line* is where features can be entered or modified. When editing parameters on the terminal edit line, current parameters will be highlighted (if previously entered).

For both the ETI menu and the TTI menu, the following edit line key strokes can be used to modify parameters.

You can select a menu item by pressing:

- A *hot key* (the number of the menu item).
- The *arrow up* and *arrow down* keys.
- The *Enter* key when your menu selection is highlighted.

Continued on the next page…

Terminal Edit Line
cont'd

The display may become unrecognizable on occasion (although rare). If this occurs, press CRTL R to refresh the display.

You can modify the parameters accessed by the menu by pressing the:

- *Delete* key to erase the highlighted parameter, or the B*ackspace* key to erase the character to the left of the cursor.
- *Left Arrow* and *Right Arrow* keys to move through the parameter being edited.
- The *Enter* key to accept the changes.

Configuring the Switch Module

Once the main menu is displayed using either method, the following configuration selections can be accessed:

- *Configure ISDN* – allows you to configure the ISDN parameters.
- *Configure System* - is designed for you to configure Passwords, the COM port, showing settings, and for software upgrades.
- Exit.

Setting ISDN Parameters

To connect the Switch Module to the ISDN Network, the following *ISDN Parameters* may require configuring:

- The ISDN Network Switch Type.
- The two Directory Numbers (DN) numbers.
- The TEI type.

From the Main Menu, press *1*

For the *Configure ISDN* menu to access the *ISDN Parameter* sub-menus.

Setting DN1

The first DN should be paired with SPID1. Follow these steps to set the first Directory Number:

1. Select 1 for "Configure ISDN" from the Main Menu on the terminal emulation program to reach the ISDN parameter menu.

2. Select 4 for "Set DN1" from the Configure ISDN menu.

If a previous DS1 number was stored, the display shows that number. If no DN! number was stored, the display is blank.

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

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

You automatically return to the Configure ISDN Menu. To save your changes if you are finished programming, Exit from the Configure ISDN Menu. Type "Y" at the system prompt to save your changes. Type "N" at the system prompt to discard your changes.

Setting DN2

The second DN should be paired with SPID2. Follow these steps to set the second Directory Number:

1. Select 1 for "Configure ISDN" from the Main Menu on the terminal emulation program to reach the ISDN parameter menu.

2. Select 5 for "Set DN2" from the Configure ISDN menu.

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

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

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

You automatically return to the Configure ISDN Menu. To save your changes if you are finished programming, Exit from the Configure ISDN Menu. Type "Y" at the system prompt to save your changes. Type "N" at the system prompt to discard your changes.

Setting The TEI Type

The *Terminal Endpoint Identifier* (TEI) provides identification of the communication device to the Central Office (CO).

We recommend that you leave the TEI setting on *Auto* if your service provider has not provided you with a fixed TEI value. If a fixed TEI is provided, select *Fixed* TEI type.

From the *ISDN Configuration* menu:

1. Press *6* to set TEI Type.
2. Toggle between *FIXED* and *AUTO*.
3. Press *Exit* to save the selection**.**

If you select *FIXED TEI*, press *SET TEI1*.

If you selected *FIXED* TEI type:

1. Press *7* to Set TEI1.
2. Enter the TEI number of the switch site (0-63).
3. Press *Return* to save the number**.**

If you change a *FIXED* TEI type, you must power-down your module to use the new ISDN settings.

Saving ISDN Changes

If you modified any ISDN parameters, the terminal will prompt you with the option to *Save ISDN Changes?*:

1) Type *Y* to save the changes.
   OR
1a) Type *N* to discard the changes.

System Menu

The *System Menu* provides you with access to configure:

- Passwords
- COM port settings
- Set ISDN Connect Rate
- Show Settings
- Software Upgrade

Passwords

The System Administrator is the person responsible for configuring *Passwords*. Selecting this menu item from the main menu will prompt the user for the System Administrator's password.

Configuring the COM Port

The COM port is available on the 2300EU and 2100EU models for serial data communications. The 2300EU multiplexes voice and data across the first B channel. On the 2100EU, the COM port uses the second B channel. This section describes the steps involved to program the RS232 port.

1. From the *System Menu* select *COM* to access the following sub-menus.

    - Data Rate
    - Parity
    - Data Bits
    - Stop Bits

NOTE: All COM port settings should be configured at one time.

Setting Data Rate

To set the *Data Rate*:

1. Highlight the data rate you want. Data rate options are: 2400, 4800, 9600, 115.2, 19200, 38400 and 57600 kbps.
2. Press Enter.

OR

2a. Press the hot key of the data rate you want.

When you make your selection, the *Parity* menu will appear.

Setting Parity

To change *Parity*:

1. Highlight the Parity you want and press Enter. Your choices are None, Even or Odd.

OR

1a. Press the hot key of the Parity you want.

When you make your selection, the *Data Bits* menu will appear.

Setting Data Bits

To change the *Data Bit* setting:

1. Highlight the desired Data Bit and press Enter. Your two options are 8 or 7 data bits.

OR

1a. Press the hot key for the Data Bits you want.

When you make your selection, the *Stop Bits* menu will appear.

Setting Stop Bits

To change *Stop Bits*:

1. Highlight the Stop Bit format you want.
2. Press *Enter*. Your options are 1 or 2 stop bits.

You will now automatically return to the *System Menu.*

Show Settings

You can display the current module *Settings*:

1. Highlight *Show Settings.*
2. Press *Enter.*

All system settings will be displayed.

Software Upgrades

All ISDN DEFINITY® Extender, Models 2300EU and 2100EU, units can be software upgraded.

Selecting this menu item prepares the module for a Serial port *Software Upgrade*. For details, see the *Software Upgrading* section later in this manual. This menu option is not required for initial configuration, but will be used later to upgrade your module, if required.

Data Communications

Introduction

ISDN DEFINITY® Extender, Models 2300EU and 2100EU, data communication requirements vary based on your extender model.

The options are:

- An RS232 COM port on the shared first B channel
- An RS232 serial port on the second B channel

The RS232 COM port that shares the first B channel is available on the 2300EU. The RS232 port on the second B channel is available on the 2100EU. The 2100EU is capable of asynchronous to synchronous PPP over the RS232 port. This can be used to establish a data connection using Windows Dial-up Networking.

The 2100EU will be discussed in detail later in this guide.

Using the RS232 COM Port

To use the COM port on the 2300EU for serial data transmissions, you will require RS232 serial cables and data equipment. The COM port connection through the modules should be treated as a null modem serial cable.

To connect the RS232 communication link, refer to the user documentation included with your data system for the required cable types and pinouts.

The Switch and Remote Module will require a male DB9 cable end to connect to the RS232 port (standard RS232 as described on the next page). Connecting the other cable end to your LAN will depend on the physical type and format the LAN uses. Talk to your Information Services Department for LAN connection requirements.

See the following Table for RS232 COM port pinout information.

9 Pin RS232 Connector	
PIN 1	DCD - Data Carrier Detect
PIN 2	Tx - Transmit Data Out
PIN 3	Rx - Receive Data In
PIN 4	DTR - Data Terminal Ready
PIN 5	Signal Ground
PIN 6	DSR - Data Set Ready
PIN 7	RTS - Request To Send
PIN 8	CTS - Clear To Send

Table 1. RS232 COM Port Pin Out

Hardware Flow Control

The COM Port uses hardware flow control to manage the data throughput. Ensure that the cables and network hardware you use have the proper hardware flow control connections to prevent lost data.

Note: To use the 2300EU for simultaneous data access, you must make sure that the COM port settings for your Remote Module, remote PC, Switch Module, and data communications server all match.

2100EU Terminal Information

Introduction

The following section is only to be referred to if you have the ISDN DEFINITY® Extender 2100EU with Terminal Adapter capabilities.

Description

The ISDN DEFINITY® Extender 2100EU is capable of using the second ISDN B Channel for Windows Dial-up Networking to establish a connection directly to a Remote Access Server.

Typical Connections

Connect an RS232 serial cable to the DB9 female connector on the Remote Module labeled *RS232* and connect the other end to the Remote PC.

If you are going to connect the Switch Module to a Windows NT Remote Access Server, an RS232 cable should be connected from the connector labeled RS232 on the Switch Module to a COM port (also could be on a COM port off a Digi™ port) on the Remote Access Server.

If you are going to be dialing directly into a Remote Access Server, connections are not required to the Switch Module, but your Information Services Department should be consulted on setting up a Dial-up Network connection on the remote PC.

9 Pin RS232 Connector	
PIN 1	DCD - Data Carrier Detect
PIN 2	Tx - Transmit Data Out
PIN 3	Rx - Receive Data In
PIN 4	DTR - Data Terminal Ready
PIN 5	Signal Ground
PIN 6	DSR - Data Set Ready
PIN 7	RTS - Request To Send
PIN 8	CTS - Clear To Send

Table 2. RS232 COM Port Pin Out

Typical Operation

When a Dial-up Networking connection is initiated, the remote PC establishes a connection to a Remote Access Server.

Essentially, your remote PC will be connected to your office network, with its full capabilities, as if you were in the office.

A Dial-up Networking connection on the PC may also be configured to make a connection to an Internet Service Provider. See your Information Services Department for internet connection information and assistance.

Setting the PC Modem

Using Windows 95/Windows NT, a modem driver will have to be added to your PC configuration.

To add a Dial-up Networking modem:

1. Open the *Control Panel* on the desktop.
2. Open the *Modems* icon in the Control Panel.
3. Select *Add*.
4. Select *Other* for modem type. Press *NEXT*.
5. Check the box for *Don't detect my modem, I will select it from a list.* Press *NEXT*.
6. Select *Motorola* for manufacturer.
7. Select *BitSURFR* as the model. Press *NEXT*.
8. Select the COM Port on the PC that will be used. Press *NEXT*.
9. Select *FINISH*.

Return to the Modems folder *General* window.

10. Select the modem you created.
11. Select *Properties*.
12. Select 57600 as the maximum speed.

Have your Information Services Department set up your Dial-up Networking connection, using the Motorola BitSURFR™ as the modem, on the remote PC and the Remote Access Server.

2100EU TA Configuration

Introduction

The following configuration parameters are for use only if you are using the 2100EU as a terminal adapter for dial-up networking.

The parameters that may require configuring are (the defaults should be acceptable in most environments):

- Data Rate
- Parity
- Data Bits
- Stop Bits

Changing Terminal Adapter Settings

This section describes the steps involved to program the terminal adapter configuration.

NOTE: You must be in the *Menu* on the Switch Module to configure the terminal adapter settings.

1. From the *Configure System* menu select *COM*. All COM port settings are configured at one time.
2. Press *Enter*.

Setting The Data Rate

To set the *Data Rate*:

1. Highlight the data rate you require. Data rate options are: 2400, 4800, 9600, 115.2, 19200, 38400, 57600 and 115.2 kbps.

The default rate of 57600 kbps is recommended.

2. Press Enter.

NOTE: Selecting a data rate slower than 57600 kbps may cause some connection problems.

When you make your selection, the *Parity* menu will appear.

Setting Parity

To set the *Parity*:

1. Highlight the parity you want. Your choices are None (recommended), Even or Odd.
2. Press *Enter*.

When you make your selection, the *Data Bits* menu will appear.

Setting Data Bits

To change the *Data Bit* setting:

1. Highlight the desired Data Bit. Your two options are 8 (recommended) or 7 data bits.
2. Press *Enter*.

When you make your selection, the *Stop Bits* menu will appear.

Setting Stop Bits

To change Stop Bits:

1. Highlight the Stop Bit format you want. Your options are 1 (recommended) or 2 stop bits.
2. Press *Enter*.

You will now automatically return to the *Configure System* Menu.

2100EU AT Command Set

Introduction

AT Commands are for the the Information Service Department, solely to customize specific configurations for your system. Changing these commands would be unusual and outside normal operation.

AT commands may be entered via a terminal program, such as Procomm or Hyperterminal. (Settings 57600, N, 8,1)

Most commands can be combined on one line, although some must be on a separate AT command line, or the last command on an AT command line
(*1!N1=, *1!N2=, and ATD). Commands are executed left to right on the line. If there is an error in a command in the middle of a line, the commands to the left of it will have been executed.

If the command consists solely of a letter followed by a number (e.g. Q*n*), omitting the number in place of the *n* is the same as specifying 0 (For example, ATQ is the same as ATQ0). Also, following the letter with a question mark will display the current value for the configuration parameter (For example, *ATE?* will display the current value for the local echo configuration parameter).

For commands that use the equal sign to assign a value to a parameter, a value must be specified. *ATS0=* is an improper command; the value does not default to zero. To display the value of the parameter configured by such a command, either replace the equal sign with a question mark or place a question mark after the equal sign (For example, *ATS0?* or *ATS0=?* will both display the value of the auto answer configuration parameter).

Command	Description	Values
!D3=	TEI - The TEI value	0-63, 255 A value of 255 enables auto TEI on both B channels
*1!N1=	DN 1 - The directory number for the first B channel	1-15 digits
*2!N1=	DN 2 - The directory number for the second B channel	1-15 digits
>V=	View the ISDN parameters	G – View ISDN switch type C – View DNs, and TEIs
>W	Save active ISDN configuration	
>Z	Replace active ISDN configuration with the saved settings	

Table 1. ISDN Configuration Commands

Command	Description	Values
@P2=	DTE speed - the speed at which the COM1 serial port is to run	2400, 4800, 9600, 115.2 19200, 38400, 57600<*default*>
@P3=	Parity	N - none <*default*> O – odd E – even
@P4=	Number of data bits	7 or 8 <*default*>
@P6=	Number of stop bits	0 - 1 stop bit <*default*> 2 - two stop bits

Table 2. COM1 Port Configuration Commands

Command	Description	Values
En	Local echo	n=0- Disabled 1- Enabled<*default*>
Qn	Status messages - are AT command responses and connection progress messages displayed	n=0- Enabled <*default*> 1- Disabled
Vn	Message format	n=0- Numeric messages 1- Verbose messages <*default*>
Wn	Carrier/Protocol result codes - are carrier and protocol messages displayed	n=0- Disabled<*default*> 1- Enabled

Table 3. Terminal Adapter Configuration Commands

Continued on the next page…

Terminal Adapter Configuration Commands *cont'd*

Command	Description	Values
Xn	Connect Messages - allows only a subset of all result messages to be displayed	n=0- Enable result codes 0-4 1- 0-4, 17, 19, 2- All result codes <*default*> Refer to the AT result codes section for a description of the codes
S0=	Auto answer - does the module automatically answer an incoming call or wait for the AT answer command to be issued before answering	0 - auto answer disabled <*default*> 1-255 auto answer enabled
S1=	Ring count. The value of this command never increments.	000 (Compatible with BitSURFR command lines)
S2=	Escape character - defines the value of the escape character that may be used to exit from the online mode. If there is no data for an interval greater than or equal to the Guard Time and then three consecutive escape characters are received, the module will return to the AT command mode from the online mode while keeping the data connection alive.	0-127 – The specified character is the escape character (default = 43) 128-255 – the escape feature is disabled
S3=	Carriage return character	0-127 (default = 13)
S4=	Line feed character	0-127 (default = 10)
S5=	Backspace character	0-127 (default = 8)

Table 3. Terminal Adapter Configuration Commands *Cont'd*

Terminal Adapter Configuration Commands *cont'd*

Command	Description	Values
S7=	Supported for compatibility with BitSURFR command lines. The value of this command is ignored.	1-255
S12=	Guard Time - The guard time before the module starts looking for the escape sequence (see S2=)	0-63, 255 (default = 50) The units for this value are 1/50 of a second
&Cn	Data Carrier Detect - Sets whether DCD is always asserted or tracks the ISDN connection	n=0- always on 1- tracks connection <*default*>
&Dn	Data Terminal Ready - Sets how the module handles the DTR signal from the PC	n=0- ignore DTR 1- Return to AT command mode from online mode (connection remains active) 2 – Disconnect the call and return to AT command mode <*default*>
%A2=	Select the protocol used on the ISDN connection	95 - PPP <*default*>
%A95=	Accept incoming data calls	D - do not answer E - answer <*default*>
%A96=	Supported for compatibility with BitSURFR command lines. The value of this command is ignored.	0 or 1
&V	View TA configuration	
@MENU	Display the 2100EU/230EU Extender configuration menu	

Table 3. Terminal Adapter Configuration Commands *Cont'd*

Continued on the next page…

Terminal Adapter Configuration Commands *cont'd*

Command	Description	Values
&Fn	Load active port profile with factory default profile *n*.	*n* = 0 or blank0
&Wn	Writes the active port profile (into non-volatile memory) to stored profile *n.*	*n* = 0
Zn	Reloads active profile from stored profile *n*.	*n* = 0 or blank

Table 3. Terminal Adapter Configuration Commands *Cont'd*

Terminal Adapter Action Commands		
Command	**Description**	**Values**
A	Answer an incoming call	
D	Initiate an ISDN call	'0'-'9', '(', ')', '-', ';', ',' For backwards compatibility the D may be followed by P, T, or W
H	Hang-up a call	
O	Return back to online mode from AT command mode	

Table 4. Terminal Adapter Action Commands

AT Result Codes

The following codes may be returned after an AT command is executed. Depending upon the value of the message format configuration parameter, either the numeric or verbose message will be displayed. The settings of the Carrier/Protocol Result Codes and the Connect Messages parameters may also keep some of the messages from being displayed.

Continued on the next page…

AT Results Codes *cont'd*		
Numeric Code	**Text Message**	**Description**
0	OK	The command line was successfully executed
2	RING	An incoming call has been detected (this may appear at any time in AT command mode and not as the result of executing an AT command)
3	NO CARRIER	No carrier was detected when trying to place a call
4	ERROR	An error was encountered in the AT command line. Commands to the left of the erroneous command were executed.
6	NO DIALTONE	No dial tone was detected when trying to place a call
7	BUSY	The called number was busy or the second EXT-3000t B channel was already in use for a POTS call
17	CONNECT 56000	A connection was established at 56 Kbps
19	CONNECT 64000	A connection was established at 64 Kbps
79	PROTOCOL PPPC	The PPP protocol is in use on the connection
96	CHANNEL B1	The call was established using the B1 channel
97	CHANNEL B2	The call was established using the B2 channel

Table 5. AT Results Codes *cont'd*

Software Upgrading

Introduction

The ISDN DEFINITY® Extender, Models 2300EU and 2100EU, allows you to perform software (firmware) upgrading in the field. The two software upgrade methods for the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, are:

- The serial port S-Record Upgrade, which requires obtaining a soft copy of the new release.
- The ISDN Upgrade, which requires a Remote Module with the latest software connecting with a Switch Module.

The latest software upgrade is stored internally in non-volatile FLASH memory.

Obtaining the Upgrade File

To download new software in the serial mode, you need a soft file that contains the latest software release. This file is in a special format called S-Record and is available from Lucent Technologies.

The file name should contain the product family, software version number, and end with the extension .exe. (e.g. 2300T117R1.exe).

Upgrading By The Serial Port

This upgrade process applies to both the Switch and Remote Modules and should take place when they are offline and powered-down. This procedure will only cover the Switch Module instructions.

NOTE: Your PC should be connected to the serial port of the Switch Module to allow access to the extender's configuration menu using the terminal.

Please refer to the section *Configuring Using A Terminal* if you require further information.

Using the terminal emulation package, configured for VT100, ensure the data rate is set to 9600 bps, 1 stop bit, no parity.

1. Power-up the extender.

The module's LED will perform a series of yellow, green and red blinks. After 10 seconds of red blinking very fast, the LED will blink green three times and red once. The LED will then blink 3 sets of 8 yellow flashes.

Continued on the next page…

Upgrading By The Serial Port *cont'd*

2. During the yellow flash sequence, type *MENU* ***during*** the yellow sequence. After you type *MENU*, the configuration Main Menu will appear on the terminal screen.
3. From the Main Menu, select the *Configure System* menu option.
4. From the System Menu, select *Software Upgrade*.

   The command will initiate the upgrade process.

   The module will display the following messages:

   Last chance to stop... The Flash memory will be erased.

   Do you want to continue?

   Enter Y to continue, any other key to abort.
5. Enter *Y* to continue. The following message will be displayed:

   Please wait while flash memory is being erased…

The erase process takes about 15 seconds. The message *Erasing Flash Memory* is displayed as Flash ROM is being prepared to receive the new code. The module should then display:

Successfully erased

The screen should display the following message:

Please upload (to module) the S Record file using ASCII protocol.

Waiting for upload file...

Continued on the next page…

Upgrading by the Serial Port *cont'd*

6. You will have 60 seconds to select the ASCII, or text file, upload protocol and select the S-record file to upload to the module. The module will then display the following message:

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

   100

   200

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

   The file was captured and stored to flash with no errors.

Verifing Upgrade

Once downloaded, the new code release is verified by checking the new code's CRC (Cyclical Redundancy Check). The module then displays:

Verifying new code...

If the test passed, the terminal will show:

Code Verified. Upgrade Successful!

Press Return Key to Restart Unit.

Your module is still running the old code until you restart the Module, press the return key to automatically restart your module and to begin executing the new software.

Upgrading from the Remote Module

This section explains how to perform a software upgrade on the Switch Module from the Remote Module.

Please ensure your Remote Module is upgraded first before you proceed to upgrading your Switch Module. Instructions for upgrading the Remote Module are in the ***Remote Module User's Guide***.

NOTE: To upgrade the Switch Module from the Remote Module, you need to enter the Administrator's password to prevent unauthorized upgrades from the Remote.

1. Enter the *Go Online?* menu by powering-up your Remote Module, or if it is already online, disconnect and return to the *Go Online?* menu.
2. Record your PBX Dial Number by entering the PBX dial number you normally use to go online with your Switch Module.
3. Change the PBX Dial Number to dial the Switch Module that you need to upgrade.
4. Go online with the Switch Module to be upgraded.
5. Enter Administrator's password.
6. While online press the *HOLD* key four times to enter the online menu.

If the code version you are running is newer than your Switch Module's code, you will have an additional menu selection called *Upgrade Switch?* If you do not have this menu selection, your switch is running the same software version as your Remote Module.

If both modules do not have the same version and you want to complete the Switch Software upgrade, from the *Upgrade Switch?* Menu:

1. Press *Ok* or 2 to start the Switch Module's software upgrade.

Continued on the next page…

The LCD will request confirmation that you want to upgrade your Switch Module by prompting *Are You Sure?*

1. Press *OK* or 2 to start.

   OR

1a. Press *No* or 3 to abort.

The LCD will display *Starting, PBX Upgrade*, followed by *Erasing Flash at PBX*, and, finally, the upgrade status.

0*% Completed*

The percentage value will increase as the upgrade proceeds, and depending on the size of code release, will take a couple of minutes. The new software is being stored to the FLASH memory on your Switch Module. When the upgrade is 100% completed, the new code is downloaded.

Verifying the Switch Upgrade

Your Switch Module will now verify if the new code release was downloaded successfully.

The remote phone should display:

Verifying Upgrade

This process may take from 12 to 15 seconds depending on the code size. Your remote phone will display:

Upgrade Successful!

The remote phone will prompt you with the question *Restart Units?* Even though the new code has been loaded into your Switch Module's FLASH memory, your Switch Module is still running your old code.

Press *Ok* or 2 to invoke a disconnection from the Switch Module and restart your Switch Module with the newly downloaded code.

If you encounter any errors during the Upgrade process, please see *Cannot Upgrade Software* section.

Troubleshooting

Introduction

The Troubleshooting section includes information for the Switch Module and Remote Module.

Whenever you encounter a problem, there are some general areas you should check first:

- Ensure the AC power adapter is connected to the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, Switch Module.
- Ensure all interconnecting cables and connections to wiring blocks are secure and properly seated.
- Ensure you are using the Remote Module at the remote site and the Switch Module at the switch site.
- Verify the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, LEDs are flashing**.**
- Eliminate potential causes of interference.
- Check the error message on the telephone.
- Verify the ISDN parameters and Dial Numbers.

No Remote Site Phone Display

- Ensure you have a Remote Module and not a Switch Module.
- Ensure the AC power adapter is connected to the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, Remote Module and the LED is lit. Ensure the phone is functioning correctly.
- Ensure the installation has not been moved or any new wiring done.

No Switch Module Connection

- Ensure the correct dial numbers have been programmed into the Remote Module. Refer to *Setting the Dial Number* earlier in this guide.
- Ensure the AC power adapter is connected to the Switch Module and all interconnecting cables are properly seated.
- Ensure you have a Switch Module at the Switch site, and not a Remote Module.
- Ensure your Remote & Switch Modules have the correct ISDN parameters.

No Indicator Lights At Power Up

- Ensure the AC power adapter is connected to the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, module.
- Ensure the AC power outlet is working. Check it with some other electrical device.
- The module may not be operational (see LED sequences on next page).

Switch Module Will Not Answer

- Someone in the office could be using the port and is unaware you are trying to connect. Wait for a short period, then try connecting again.
- Ensure you entered the correct PBX dial number (your Switch Module DN1 number).
- Your Switch Module's DN1 may be entered incorrectly. If a DN is incorrect, the ISDN line will not receive a call on that DN.

LED Sequences

The LED sequences on the Switch and Remote Modules are indicators of the status of the extenders during power up. Please refer to the tables below if you experience problems when powering up.

LED Power Up Sequences	
LED Sequence	**Description**
No LED blinks	Error with hardware or AC adapter.
First blink: Red or Green	LED is not functioning properly as units should blink Yellow.
Yellow	EPROM Checksum test failed. Faulty EPROM or Board problem.
Yellow & 1 Red	DRAM, Data test failed
Yellow & 2 Red	DRAM Address test failed
Yellow & 3 Red	DUART, test failed.
Yellow & 7 Reds & 1 Green	Passed all hardware tests

Table 6. LED Power Up Sequences

LED Power Up Verification Sequences	
LED Sequence	**Description**
Rapidly blinking Red during process and then 1 Green to indicate process is complete.	• 10 - 15 seconds. FLASH code is being verified and if valid will be executed. • 25-30 seconds FLASH code is invalid EPROM code copied to FLASH.
3 Reds or 3 Greens followed by a Red.	• Red – Running EPROM code, FLASH write *failed*. Contact Customer Service. • Green – FLASH load *passed*, running FLASH code.
3 sets of 8 Yellow blinks	Access terminal configuration menu by typing 'MENU'.

Table 7. LED Power Up Verification Sequences

LED Indicator Sequences	
LED Sequence	**Description**
1 Red	The DSP (*Digital Signal Processor*) is faulty.
2 Red	• Port to PBX (Switch Module) is not operational • or Port to the phone (Remote Module) is not operational.
3 Red *or* 4 Red	If you have not tried to place or receive a call, then the Extender is functioning normally. If you have tried to place or receive a call, there is a network error.
1 Green & 0 Red *or* 1 Red *or* 2 Red	Unit is online with the Switch Module (B1). Data connection is not established. (2100EU) Data connection is established. (2100EU) Data (B2) dialing for connection. (2100EU)

Table 8. LED Indicator Sequences

LED Sequence	Description
2 Green *&* 0 Red *or* 1 Red *or* 2 Red	Unit is in COD Waiting Mode (B1). Data connection is not established (2100EU). Data connection is established (2100EU). Data (B2) dialing for connection (2100EU).
3 Green *&* 0 Red *or* 1 Red *or* 2 Red	Phone display is Go Online? (B1) Data connection is not established. (2100EU). Data connection is established. (2100EU). Data (B2) dialing for connection. (2100EU).
1 Red 1 Yellow 1 Green	Fatal Error. Contact Customer Support.

Table 8. LED Indicator Sequences *cont'd*

*For Remote Module only.

Serial S-Record Upgrade Errors	The Serial S-Record upgrade may encounter problems during the upgrade process. Your terminal will display either cannot *Upgrade Software* or *Upgrade Failed* messages explaining why the upgrade failed.
Cannot Upgrade Software	If the erasing flash process takes longer than 60 seconds a flash error will occur and will require you to power-down your module (for at least ten seconds). You then need to retry the upgrade process by re-entering the configuration menu. If the same result occurs, your flash memory is not working correctly and you will have to contact Customer Support. Verify failure with *Power-up LED Sequences*, three red LED flash failure.
Upgrade Failed	If the upgrade failed, attempt the download procedure again. If you encounter consistent failures, consider using the ISDN Upgrade procedure or contacting Customer Support. Refer to *Cannot Upgrade Software* section.
ISDN Upgrade Errors	The following upgrade errors may be displayed if problems occur during the upgrade process. Reattempt the upgrade if an error occurs. If errors continue, please contact Customer Support.
PBX Flash Too Small	The code is too large for the Switch Module Flash ROM and is unable to upgrade your unit with this code release.
REM Flash Too Small	The code is too large for the Remote Module Flash ROM is unable to upgrade your unit with this code release.

Upgrade Start Failure	The upgrade start-up process failed. Retry upgrade.
Flash Erase Failure	The destination Flash Memory did not successfully erase. Retry upgrade. If it continues to fail, the destination module may have a Flash memory hardware problem. (Power-down upgrade unit and retry.)
Flash V Erase Failure	The Flash memory did not successfully erase test. Retry upgrade. If it continues to fail, the destination module has a Flash memory hardware problem.
UG Data Timeout Failure	The Remote Module was expecting a response but did not receive it within the required time. The upgrade failed.
Data End Timeout Failure	The upgrade failed.
UG CRC Timeout Failure	The code in your upgrade destination module is invalid. Retry upgrade.

Diagnostic Statistics

Accessing *Diagnostic Statistics* could be helpful in determining whether an error has occurred before. For each error code, a count of the number of occurrences is kept while the modules power up and are also reset during this time.

While going online or making a connection with the ISDN network when leaving COD, the remote phone may display *Connect Error*, indicating an ISDN error event occurred.

Errors are displayed as a code number and letter. The letter represent the severity of the error, increasing in severity from A to C, as follows.

A: Could occur regularly. A common error that should not directly impair Extender operation. (For example, out of sequence ISDN packets.)

B: Should not occur often. (Something has been unplugged, or if it goes online without the PBX connected, get a V42 error.)

C: should not occur at all. Probably the result of a hardware problem (or failure). (For example, Number of times the DSP communication failed.)

Please see the *Error Codes* table on the following page.

Continued on the next page…

Error Code	Description
101A	Number of Received ISDN Voice Packets that contained a CRC error.
102A	Number of Received ISDN TCM Signaling Packets that contained a CRC error.
103A	Number of Received ISDN User Data Packets that contained a CRC error.
104A	Number of Received ISDN Packets that contained an Invalid V42 Address.
105A	Number of Rejected Received ISDN Signaling packets because they were out of sequence.
106B	Number of times maximum number of Signaling Packet re-transmissions exceeded (Caused Digital Port Data to be lost).
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.
110C	Number of times Signaling channel transmit locked up (transmit buffers full when no data to send).
111A	Number of Rejected Received ISDN 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.

Table 9. Error Codes

Continued on the next page…

Error Codes *cont'd*	
Error Code	**Description**
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.
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.
124C	Number of times Synchronous Communications Controller IC transmit locked up.
125B	Number of fatal errors that caused unit to restart (caused by errors 124C, 118C, and 120B).

Error codes 101 to 125 are directly compatible with 2000 error codes.

Exclusive Error Codes	
Error code	**Description**
126C	Invalid Length of SCC Tx packet
127B	SCC Transmit Busy
128A	SCC Rx Status Error
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 Signaling Buffers were in Use
134A	Number of Times Signaling packet too long
135X	Reserved for future use 1
136X	Reserved for future use 2
137X	Reserved for future use 3
138X	Reserved for future use 4
139X	Reserved for future use 5
140X	Reserved for future use 6
141X	Maximum number of error codes

Resetting The Statistics

After viewing Diagnostics Statistics to determine a problem with your system, and you no longer require the messages displayed, the statistics need to be reset.

1. Press *3* until the display shows *Reset Stats*?

   OR

1a. Press *2*. The statistics are now reset.

Connection Errors

During the *Go Online* process, or when you are online with the Switch Module, the remote phone may display a Connection Error. This error may indicate a line condition problem or a configuration problem that is causing the Remote and Switch Modules to not complete a successful connection or break the existing connection.

Table 10 lists all possible Connection Errors that could be displayed, likely causes of the error condition, and suggestions/actions to correct the error.

Connection Errors	
Message	**Description**
Line Inactive	There is a problem with the physical connection with the ISDN line interface. Ensure your Extender is fully connected with the ISDN line, check cables and jack connections.
Line Not Ready	Check ISDN parameters. The Remote Module ISDN is not responding. The Remote Module is not connecting to the ISDN Network. Ensure the ISDN parameters and Dial numbers are correct and the Remote Module connects to the line.
Channel in Use	At times when the Extender places a call, if the previous call failed to connect, the network requires a delay between the next call attempt. If you do not wait long enough, this message is displayed. If connection fails, re-attempt to Go Online.
No Free L4 Buff	If this error is displayed, please contact Customer Support.
No Dial Tone	Invalid number entered for PBX Dial number, possible problems with ISDN network: no Route is available, Bad channel, Switch Congestion.
No Answer	Call has been rejected by far end (Switch). No user response. May have dialed an invalid number (wrong PBX Dial number).

Table 10. Error Codes *continued on the next page…*

Connection Errors *cont'd*	
No Carrier	On initial connection did not receive connect acknowledge from network. Check physical ISDN connections and parameters. Possible network problem.
Line Busy	The PBX Dial number is busy. Someone is on line with the Switch Module. Ensure you entered your Dial numbers correctly and check that no one else is currently using the Switch Module.
Invalid Number	The PBX Dial number is an invalid number. Ensure you have entered your Dial numbers correctly.
Call Prog Tout	Call progress time out. The module was waiting for a message from the network that did not receive. Possible ISDN network problem.
User Abort	Displayed when the user hits the **Drop/Redial** key three times to abort the connection process.
V42 Connect Fail	The Remote and Switch Modules connect but the IVP does not synchronize. Possible ISDN Connect rate problem. Your Switch Module ECS digital port may be offline or disconnected. Or you are connected to an incompatible communication device. The ISDN link has too many errors to maintain a valid connection. Try changing your ISDN Connect Rate from Auto to 56k.
DSP Fatal Error	DSP communication failed. If continues to be displayed, then possible hardware problem. Contact Customer Support.

Table 10. Error Codes

Connection Errors *cont'd*	
Port Disconnect	The Digital port at the Switch Module was disconnected from the Switch Module.
No SCC Transmit	If continues to be displayed, then possible hardware problem. Contact Customer Support.
Problem Continue	If you are still experiencing difficulties, the suitability of the phone lines is in question. Check with your phone company to ensure the line requirements have been met.

COD Failure Messages

The following diagnostic messages are used to facilitate troubleshooting of ISDN line problems during COD (Call on Demand) operation, the remote display telephone shows 'COD Waiting,' followed by a message. Table 4-6 contains the possible COD failure messages.

Table 4-6. COD Failure Messages

Message	Description	Possible Cause
Dialback Timeout	The unit is in Dialback mode and the Remote came out of COD, but never received a Dialback call from the Switch module.	Switch unit could not place an ISDN call to the Remote.
ISDN Conn Lost	The unit comes out of COD mode and successfully connects, but the connection is lost. *Note: If placing an outgoing call the unit tries to reconnect.*	Connectivity problems with the ISDN network.
V.42 Failed	The units wake out of COD and successfully establish a connection, but were disconnected due to a V.42 failure. *Note: If placing an outgoing call the unit tries to reconnect.*	Data problems on the ISDN network.

Table 4-6. COD Failure Messages, *continued*

Message	Description	Possible Cause
Handshake Failed	The units wake out of COD and successfully establish a connection, but the Remote was unable to establish a V.42 connection to the Switch module.	Data problems on the ISDN network.
ISDN Conn Failed	The units attempt to wake out of COD mode but are unable to establish an ISDN connection.	Connectivity problems with the ISDN network.

Fatal Errors

If a fatal error occurred during the previous operation cycle (the last time the Extender was powered up), the Remote phone will display *The Last Error Was*, followed by a message.

Unknown Error	Unknown fatal error occurred on previous power up

Fatal Error Messages	
Message	**Description**
No DSP Response	If the DSP is not operating correctly, contact Customer Support.
Port Disconnected	The Digital port at the Remote Module was disconnected during normal operation.
No SCC Transmit	If it continues to be displayed, then possible hardware problem. Contact Customer Support.

Table 11 The fatal error messages and descriptions.

Customer Support Information

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

Equipment Limitations

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. The department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure 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 might be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Any repairs or alterations made by the user to this equipment or equipment malfunctions, can give telecommunications company cause to request the user to disconnect the equipment.

For their own protection, users should ensure the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution is particularly important in rural areas.

Continued on the next page…

Equipment Attachments Limitations
cont'd

***Caution*:** Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician.

There are no user-serviceable parts inside this equipment.

Mention of third party products are for informational purposes only and constitutes neither endorsement or recommendation of product.

Glossary

B

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

C

CRC – Cyclical Redundancy Check
A process used to check the integrity of a block of data.

Call On Demand mode
A feature of the ISDN DEFINITY® Extender, Models 2300EU and 2100EU, that disconnects the ISDN connection between the Switch and Remote Modules when there is no activity and reconnects the modules when activity occurs.

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

D

DCD – Data Carrier Detect
A signal from the DCE (modem or printer) to the DTE (typically your PC), indicating the modem is receiving a carrier signal from the DCE at the other end of the telephone cicuit.

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

D

Dial Line
A telephone line that is part of the Public Switched Telephone Network and is accessed through the DEFINITY® Extender's automatic dial-up function.

Direct Line
A dedicated circuit or private leased line.

Directory Number
A Directory Number (DN) is the number programmed into the Switch and Remote Modules used to dial the modules and any equipment connected to them. There are two Directory Numbers for each module, one to dial the module and one to dial the PC, server, or fax machine, analog modem, or analog telephone connected to the module.

DTE speed
The speed at which the COM1 serial port runs.

DTR – Data Terminal Ready
A control signal sent from the DTE to the DCE that indicates that the DTE is powered on and ready to communicate. DTR can also be used for hardware flow control.

E

EU – Europe
Identifies this product as a European product.

ETI – Enhanced Terminal Interface

F

Facility
Transmission facilities. Usually a metallic pair of wires, 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.

P

PBX
Private Branch Exchange.

R

Remote Module
The DEFINITY® Extender module that connects to the remote DEFINITY telephone.

S

Service Profile Identifier
A Service Profile Identifier (SPID) is a number that identifies to the ISDN network the type of service to be provided. Each SPID is attached to a Directory Number. Each module must be programmed with two SPIDs, one for each Directory Number. *See Directory Number*.

Switch Module
The DEFINITY Extender module that connects to the DEFINITY ECS.

T

TEI – Terminal Endpoint Identifier
Up to eight devices can be connected to one ISDN BRI line. The TEI defines which device is communicating with the Central Office Switch.

TTI - Text Terminal Interface
The fax machine's telephone number and user name.