

CMS™ 400

ISDN Access Manager

User's Guide

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About This Manual

Manual Description

The *CMS 400 ISDN Access Manager User's Guide* is designed to help you understand and operate your CMS 400 ISDN Access Manager module. It is important that you understand your network configuration and the concepts of a PC-based network. You should also be familiar with the basic skills and concepts required to use the CMS 400 network management system. See "How to Use the CMS 400 Document Set" below for information about other CMS 400 manuals you should read.

This manual is organized as follows:

- **Chapter 1 - Introduction** provides an overview of the CMS 400 ISDN Access Manager module and its features.
- **Chapter 2 - BRI 2000/1 Terminal Adapter** explains how to use the CMS 400 to configure, monitor, control, and test the BRI 2000 and BRI 2001 terminal adapters.
- **Chapter 3 - ISX5005/5010 Access Multiplexer** explains how to use the CMS 400 to configure, monitor, control, and test the ISX 5005 and 5010 digital access multiplexers.
- **Chapter 4 - DAP 4000 Terminal Adapter** explains how to use the CMS 400 to configure, monitor, control, and test the DAP 4000 series of terminal adapters.
- **Chapter 5 - DAP MS20 Terminal Adapter** explains how to use the CMS 400 to configure, monitor, control, and test the DAP MS20 terminal adapter.

How to Use the CMS 400 Document Set

The first CMS 400 manual you should read is the *CMS 400 Installation Manual*. This manual explains how to install your hardware and software. It provides a complete description of system components, cabling requirements, and power connection procedures.

Next, read the *CMS 400 Reference Manual*. This manual is designed to familiarize you with the basic skills and concepts you'll need to use the CMS 400. It defines all key functions, describes both the Windows and non-Windows operator interfaces, and explains how to enter commands on the command line.

Then, read the *CMS 400 User's Guide*. This manual explains how to use specific CMS 400 applications. The information in this manual is generic to all types of managed products.

Finally, read the manual that comes with each element management module you are using. Each of these manuals contains information that is specific to that particular module.

Terminology and Conventions

This manual covers both the Windows and non-Windows versions of this software product. In most instances, the step-by-step instructions do not distinguish between the two methods of operation.

This manual uses the generic term "Select" to indicate all possible ways to execute a command—clicking a mouse button, moving the cursor to a designated location and pressing [ENTER], or typing a character sequence. Refer to the *CMS 400 Reference Manual* for instructions on Windows and non-Windows operation.

This manual uses the following typographical conventions:

- Text appearing on a computer screen is shown in this font:

The screen displays Write Straps To Table.

- Characters that you must type on a keyboard are shown in **this font**:

At the prompt, type **MON_EIA**.

- Special keys that you must press on a keyboard (such as Enter or Ctrl) are shown in brackets:

Press [ENTER].

Table of Contents

Chapter 1 - Introduction

About the ISDN Access Manager	1-1
Software Description.....	1-1
System Features	1-1

Chapter 2 - BRI 2000/1 Terminal Adapter

Overview	2-1
Adding Ports and Channels.....	2-1
Adding COM Ports	2-2
Adding EDMs.....	2-2
Adding Channels	2-2
Adding Units to Database	2-3
Displaying Unit Information.....	2-5
Polling the Unit.....	2-6
Displaying Alarms.....	2-6
Unit Configuration	2-6
Creating Strap Tables	2-6
Assigning Strap Tables.....	2-11
Downloading Strap Tables	2-11
Changing Strap Settings	2-11
Comparing Strap Settings.....	2-13
Defining the Password	2-14
Defining the Local Directory Number.....	2-15
Storing Directory Numbers.....	2-16
Storing CLI Numbers.....	2-16
Storing Service Profile IDs	2-17
Monitoring Unit Status.....	2-18
Dial Operation.....	2-19
Originating Calls	2-19
Originating a CMS Call.....	2-20
Clearing a Call	2-20
Testing.....	2-20
Starting Self-Test.....	2-20
Starting Digital Loop Test.....	2-21
Ending Tests	2-21
Clearing Diagnostic Session.....	2-21
Monitoring Statistics.....	2-22
Retrieving Statistics from Unit.....	2-22
Displaying Retrieved Statistics	2-23
Storing Statistics to File	2-24
Displaying Stored Statistics.....	2-24
Deleting Statistics File.....	2-25

Resetting Unit Statistics	2-25
Using Front Panel Emulation	2-25

Chapter 3 - ISX 5005/5010 Access Multiplexer

Overview.....	3-1
Adding Ports and Channels	3-1
Adding COM Ports	3-2
Adding EDMs	3-2
Adding Channels.....	3-2
Adding Units to Database.....	3-3
Displaying the Chassis.....	3-4
Displaying Chassis Alarms	3-5
Displaying the Software Version	3-5
Displaying Individual Card Information.....	3-6
Displaying the Trunk History of a Node.....	3-6
Unit Configuration.....	3-7
Configuring Node Parameters.....	3-7
Configuring Trunk Parameters.....	3-7
Configuring Circuits on a Trunk.....	3-9
Configuring Port Parameters.....	3-9
Defining a Top Level Strap Table Definition	3-11
Loading Phone, CLID, and SPID Numbers	3-13
Displaying Masked Phone Numbers.....	3-13
Monitoring	3-14
Monitoring a Trunk.....	3-14
Monitoring a Port.....	3-16
Restoral Operations	3-18
Testing	3-19
Initiating Trunk Level Tests.....	3-19
Initiating Port Level Tests.....	3-20
Maintain a Disaster Table on an ISX 5010 Chassis	3-21
ISX 5010/ISX 5005 Upgrade.....	3-21
ISX5314CS Software Download Upgrade	3-22

Chapter 4 - DAP4000 Terminal Adapter

Overview.....	4-1
Connecting a DAP4000 to the CMS 400.....	4-1
Adding a DAP4000 to the CMS 400 Database	4-1
Displaying the DAP4000.....	4-2
Displaying DAP4000 Alarms	4-3
Displaying the Event History of a DAP4000.....	4-4
Unit Configuration.....	4-5
Configuring the Profile Parameters	4-5
Configuring the Profile-Independent Parameters	4-5
Copying a Profile to Another Profile	4-6
Configuring General Parameters.....	4-6

Configuring the Entire Unit Configuration	4-7
Loading Phone and CLI Numbers into a Logical Unit.....	4-8
Loading the CMS Phone Number	4-8
Auto Loading the Remote Addresses of a Logical Unit.....	4-9
Editing the Remote Addresses.....	4-9
Masking Alarms	4-9
Modifying the Internal Log	4-10
Monitoring Unit Status.....	4-10
Dial Operation.....	4-12
Testing.....	4-13

Chapter 5 - DAP MS20

Overview	5-1
Adding Ports and Channels.....	5-1
Adding COM Ports	5-2
Adding EDMs.....	5-2
Adding Channels	5-2
Adding Units to Database	5-3
Displaying Unit Information.....	5-5
Polling the Unit.....	5-6
Displaying Alarms.....	5-6
Displaying Event History	5-6
Unit Configuration	5-7
Storing Phone Numbers	5-8
Dial Operation.....	5-8
Originating Calls	5-8
Originating a CMS Call.....	5-9
Switching to Dedicated Line	5-10
Clearing a Call.....	5-10
Monitoring	5-10
Testing.....	5-11
Starting Tests	5-11
Ending Tests	5-11

Figures

2-1	Channel Configuration Screen	2-3
2-2	Insert Unit Screen	2-4
2-3	BRI 2000 Control Screen	2-5
2-4	Strap Unit Menu	2-7
2-5	Define Strap Table Menu	2-8
2-6	BRI 2000 Strap Table	2-9
2-7	Typical Strap Table List	2-10
2-8	Compare Straps Menu	2-13
2-9	Access Number Configuration Screen	2-14
2-10	Local Directory Number Configuration Screen	2-15
2-11	Service Profile ID Configuration Screen.....	2-17
2-12	BRI 2000 Port Status Screen	2-18
2-13	BRI 2000 Dial Screen.....	2-19
2-14	Statistics Display – Graphic Format – Graphic Format	2-23
2-15	Statistics Display – Text Format	2-24
2-16	Front Panel Emulation Screen	2-26
3-1	Channel Configuration Screen	3-3
3-2	ISX 5010 Multiplexer Chassis View	3-5
3-3	ISX 5010 Trunk Status Screen	3-8
3-4	ISX 5010 Port Level Screen	3-10
3-5	ISX 5010 Trunk EIA Status Screen.....	3-15
3-6	ISX 5010 Port EIA Status Screen.....	3-16
3-7	ISX 5010 Voice/LBRV Card Port Signals	3-17
4-1	DAP4000 Access Product Chassis	4-3
4-2	DAP4000 History Information	4-4
4-3	DAP4000 Card Status Screen.....	4-11
4-4	DAP4500 IBU Information	4-12
5-1	Channel Configuration Screen	5-3
5-2	Insert Unit Screen	5-4
5-3	DAP MS20 Control Screen	5-5
5-4	Dial Screen	5-9
5-5	Status Screen.....	5-10

Tables

3-1	ISX 5010 Trunk EIA Status Field Descriptions	3-15
3-2	ISX 5010 EIA Status Field Descriptions.....	3-16
3-2	ISX 5010 EIA Status Field Descriptions.....	3-17
3-3	Status Signal Descriptions for an ISX 5010 Voice or LBRV Card.....	3-18
4-1	DAP4000 Status Screen Field Descriptions	4-11

Chapter 1

Introduction

About the ISDN Access Manager

The Communications Management Series (CMS) 400 ISDN Access Manager allows you to manage and control your entire network of Milgo Solutions ISDN access products from a central location. You can view and modify unit options, monitor operating status, originate and disconnect calls, receive alarms, and conduct tests — all without the aid of remote personnel.

The CMS 400 ISDN Access Manager can manage the following ISDN access products:

BRI 2000	DAP4100
BRI 2001	DAP4150
ISX 5005	DAP4200
ISX 5010	DAP4500
DAP MS20	DAP4550
DAP4000	

Software Description

The ISDN Access Manager is one of several element management modules available with the CMS 400. Each module allows the CMS 400 to manage a certain group of products. Although the code for managing ISDN products is embedded within the CMS 400 base software (kernel), you must install the ISDN Access Manager software to turn it on. This modular software architecture allows you to customize the CMS 400 system for your particular network requirements. (Refer to Chapter 3 in the *CMS 400 Installation Manual* for instructions on installing modules.)

System Features

The CMS 400 ISDN Access Manager has an extensive array of features to give you complete centralized control of your ISDN access network. These features include:

- **Unit Configuration** – Allows you to view and change options for any unit in the network. You can download option changes to one, several, or all units in the network.

- **Status Monitoring** – Allows you to quickly view the status of any unit in the network. You can monitor EIA interface status, ISDN line status, unit operating speed, and various unit-specific status conditions.
- **Statistics Monitoring** – Allows you to precisely measure and graphically display line quality statistics for BRI 2000 units that support statistics reporting. This feature provides useful information on ISDN line availability and quality.
- **Alarm and Event Logs** – Automatically stores alarm and event messages received from network units. These messages notify you about unit problems. Allows you to view or print reports.
- **Call Origination/Disconnection** – Allows you to command any unit to originate or disconnect an ISDN call.
- **Unit Testing** – Allows you to perform comprehensive diagnostic testing on any network unit.
- **Front Panel Emulation** – Allows you to control certain types of devices as if you were sitting at their front panel. You can view a graphic representation of the front panel and "press" buttons using a mouse or keyboard.

Chapter 2

BRI 2000/1 Terminal Adapter

Overview

This chapter explains how to use the CMS 400 to control the BRI 2000, BRI 2000 SP, and BRI 2001 terminal adapters. It explains how to:

- Add ports and channels to the database
- Add units to the database
- Display unit information
- Configure the unit
- Monitor operating status
- Originate and disconnect calls
- Test the unit
- Monitor line quality statistics
- Use front panel emulation

Adding Ports and Channels

Before you begin managing your BRI 2000 units, you must configure the CMS 400 database. The first step is to add to the database the ports and channels you are using to control each unit. To do so, you must:

1. Use CMS Component Map to add and define the COM port(s) to which the EDM is connected.
2. Use CMS Component Map to add and define the EDM(s) to which the unit is connected.
3. Use CMS Component Map to add and define a channel for each connected EDM port.

Note: See the *CMS 400 Installation Manual* and the *BRI 2000 Installation and Operation Manual* for instructions on connecting the BRI 2000 to an EDM port.

Adding COM Ports

Starting from the CMS 400 main window, follow these steps for each connected CMS 400 COM port:

1. Select Database from the Commands menu.
2. Select CMS Component Map from the adjacent menu.
3. Select Add Port.

The Add Ports screen is displayed.

4. If the COM port is connected directly to the EDM, enter **EDM On No DDM** in the Usage field.

If the COM port is connected to a DDM, enter **DDM 1-4** in the Usage field.

Note: For proper operation, the COM port must have the correct address and IRQ assigned. See the *CMS 400 User's Guide* for detailed instructions.

5. Press [PGDN] to add the COM port to the database.

Adding EDMs

Follow these steps for each EDM connected to a BRI 2000:

1. Position the cursor on the COM port and select Add EDM.
2. Define the various fields in the Add EDM screen as desired.
3. Press [PGDN] to add the EDM to the database.

Adding Channels

You can now add and define the channels that control each unit. Follow these steps for each EDM port connected to a BRI 2000:

1. Position the cursor on the EDM and select Channels.
2. Position the cursor on the EDM port and select Add.

The Channel Configuration screen appears. (See Figure 2-1.)

The screenshot shows a terminal window titled "Channel Configuration". The screen is divided into several sections. At the top, it says "Channel Configuration". Below that, there are several fields: "Name BRI_CTRL", "Status Online", "Streaming Autosquelch On", "Timeout <5-99 sec> 10", "Through EDM 3", "Usage Of Channel T7", "Port 16", and "Speed <T7 And PPP Only> 19200". A note at the bottom of the screen reads: "Be sure to use EDM STATUS to download channel parameters when 'Usage' is changed". Annotations with arrows point to various fields: "Enter unique channel name" points to the Name field; "Enter T7" points to the Usage Of Channel field; "Enter 19200 if all units on channel support that speed" points to the Speed field.

Figure 2-1. Channel Configuration Screen

3. Define the fields in the screen as follows:

Name – Enter a unique name to identify the channel.

Usage of Channel – Enter **T7**.

Speed – The recommended speed is 19,200 bps. The BRI 2000 CMS Rate parameter must also be set to 19,200 bps. If there are other devices connected to the same EDM, you may need to set a lower rate to avoid overburdening the EDM. It is recommended that the sum of the CMS speeds of the devices connected to the EDM not exceed 19,200 bps.


Set other fields in the screen as desired.

4. Press [PGDN] to add the channel to the database.

Adding Units to Database

Follow these steps to add each unit to the database:

1. From the CMS 400 main window, do one of the following:

- Click the  toolbar button.
- Select Database from the Commands menu. Then select Network Map from the adjacent menu.

2. Select Insert .

The Insert Unit screen appears. (See Figure 2-2.)

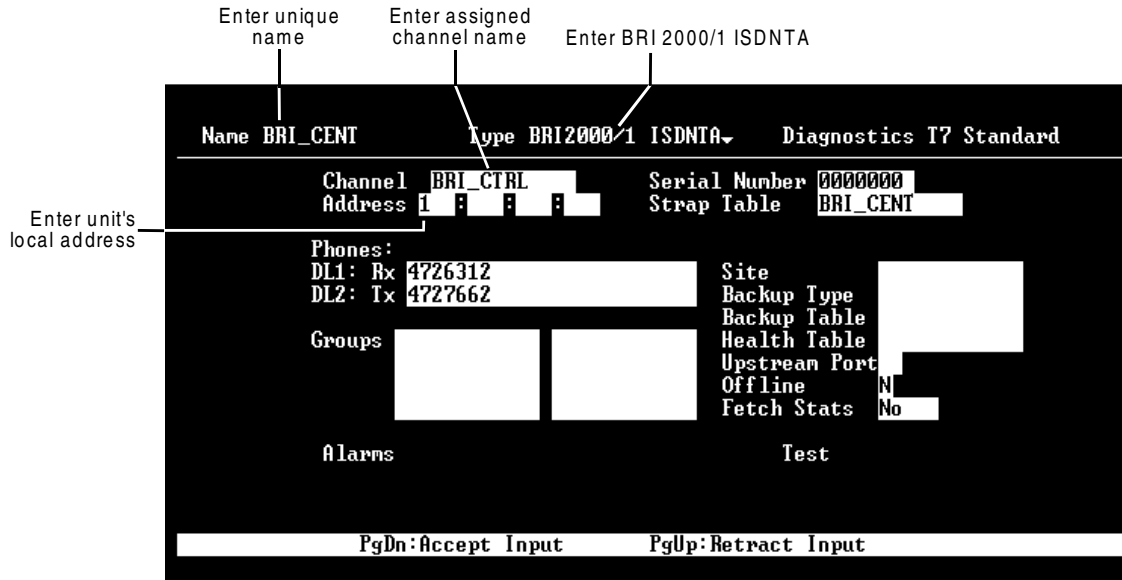


Figure 2-2. Insert Unit Screen

3. Define the fields in the Insert Unit screen as follows:

Name – Enter a unique name to identify the unit.

Type – Enter **BRI2000/1 ISDN**.

Diagnostics – Enter **T7 Standard**.

Channel – For central units connected to an EDM, enter the name you previously assigned to the channel controlling this unit. For remote units, leave this field blank.

Address – Set the first (leftmost) address field to match the address assigned through the unit's front panel. Leave the remaining fields blank.

Define remaining fields in the screen as desired.

4. Press [PGDN] to add the unit to the database.

Displaying Unit Information

The CMS 400 allows you to display basic information about each BRI 2000 in your network. This information includes the unit's software revision, part number, serial number, and assigned strap table.

1. From the CMS main window, select Commands.
2. Select WAN Control from the pulldown menu.
3. Select BRI 2000 ISDN TA Control from the adjacent menu.

The Select Unit by Criteria screen appears.

4. Enter information to specify the unit you want to display and press [PGDN].

Note: If only one unit is found in the database, you are not prompted for the unit information as described in Step 3.

The BRI 2000 Control Screen appears. (See Figure 2-3.) The top of the screen provides basic unit information. The bottom of the screen provides the various operations you can select.

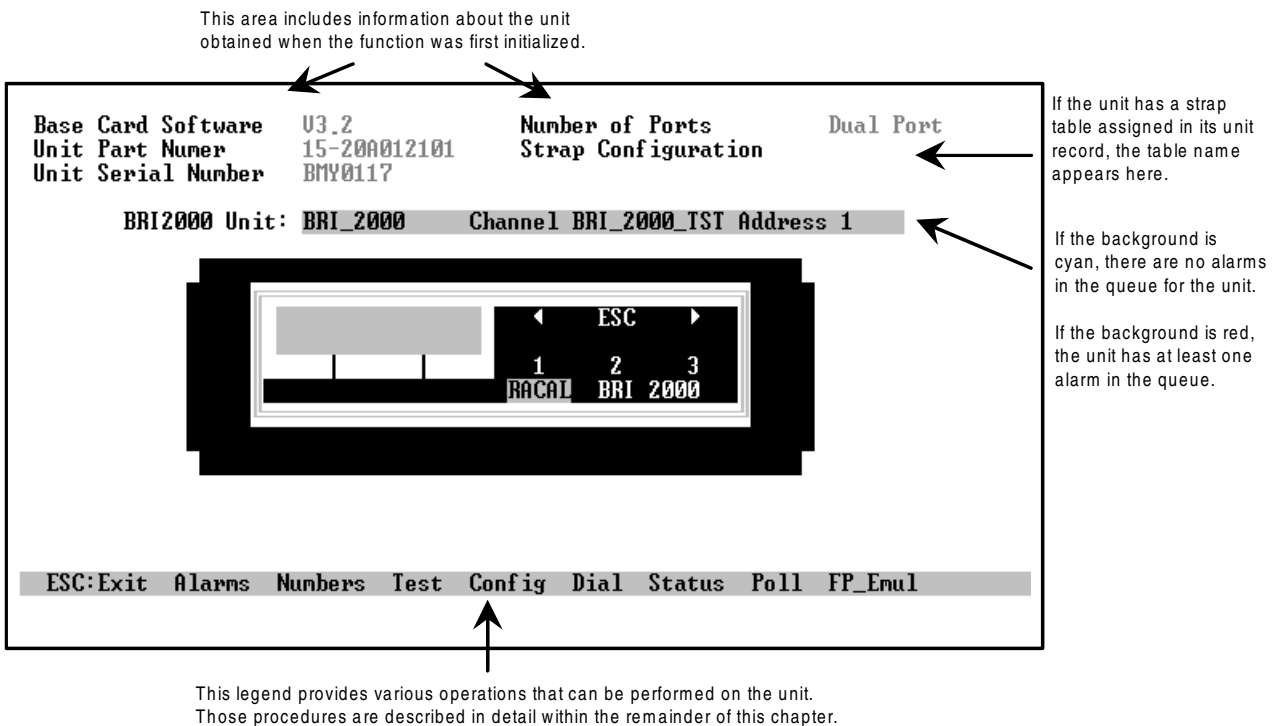


Figure 2-3. BRI 2000 Control Screen

Polling the Unit

To ensure that the BRI 2000 is communicating with the CMS 400, select **Poll** from the bottom legend. A response is returned indicating whether or not the unit responded to the poll.

Displaying Alarms

If the color of the unit indicates there are alarms in the CMS 400 alarm queue, you can view those alarms by selecting **Alarms** from the bottom legend. Any alarms associated with the unit are displayed. Refer to the *CMS 400 Reference Manual* for information about resolving alarms.

Unit Configuration

The CMS 400 allows you to configure the strap (option) settings of an entire network of BRI 2000 units from a central location. Unit configuration consists of the following basic steps:

1. Creating desired strap tables
2. Assigning strap tables to units
3. Downloading strap tables to units

This section explains how to complete each of these steps. It also explains how to change strap settings and compare two sets of strap configurations.

Creating Strap Tables

A strap table defines a particular configuration of unit option settings. You should create one strap table for every unit or group of units in your network that you want to configure identically. The CMS 400 can store up to 4000 different strap tables.

There are two ways to create a strap table:

- **Read straps from a preconfigured unit.** With this method, you first configure a unit using CMS 400 front panel emulation (as described later in this chapter) or its own front panel. You then read the unit's strap settings into the CMS 400 and write them to a strap table.
- **Manually define a strap table.** With this method, you select a strap table type and then set each option in the table manually.

Reading Straps from Unit

To create a strap table by reading straps from a preconfigured unit:

1. From the BRI 2000 Control screen, select Config.
2. Select Run Strap Unit function.

The Strap Unit menu is displayed, as shown in Figure 2-4.

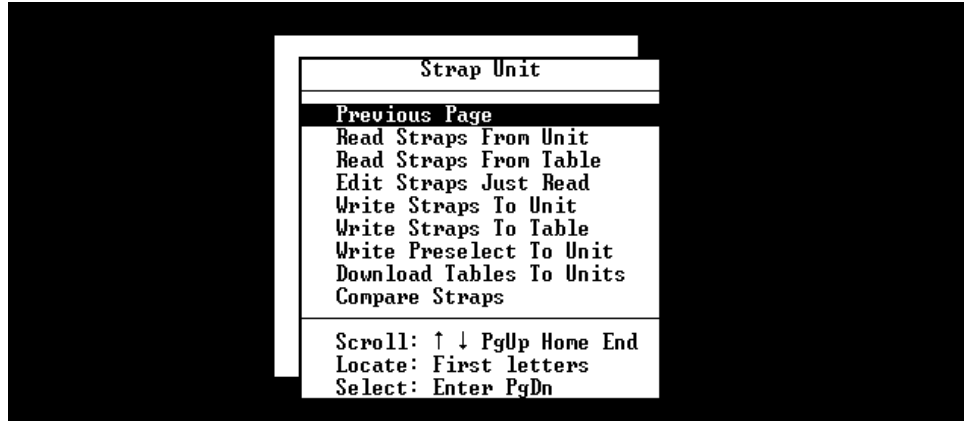


Figure 2-4. Strap Unit Menu

3. Select Read Straps from Unit.

The CMS 400 begins reading straps from the unit. When it is finished, the screen displays Strap Data Now in Edit Area.

If you want to change any of the strap settings before creating a table, follow Steps 4 and 5. If not, skip to Step 6.

4. Select Edit Straps Just Read.

The screen displays the strap settings just read.

5. Position the cursor on the strap(s) you want to change and press [TAB] to scroll through the possible settings.

Press [PGDN] or [PGUP] to move through the various pages of strap settings. When you've finished making changes, press [ESC] to return to the Strap Unit menu.

6. Select Write Straps to Table.
7. Select Create a New Strap Table.

8. Enter a unique name for the table and press [PGDN].

The configuration is then stored as a new strap table.

Manually Defining a Strap Table

To manually define a new strap table:

1. From the BRI 2000 Control screen, select Config.
2. Select Define a Strap Table.

The Define Strap Table menu is displayed, as shown in Figure 2-5.

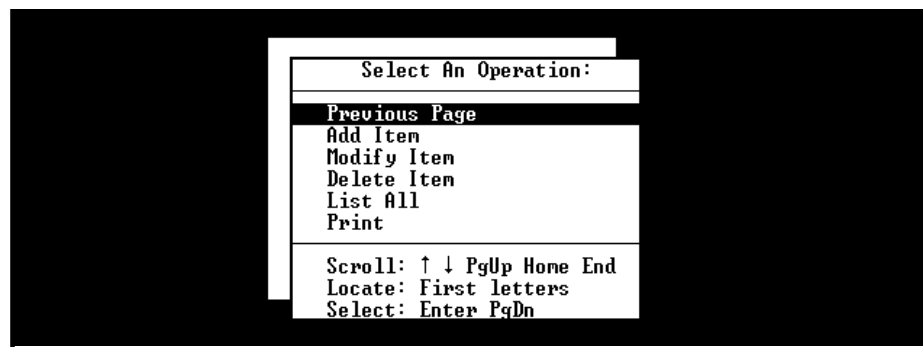


Figure 2-5. Define Strap Table Menu

3. Select Add Item.
4. Enter a unique name to identify the table in the Strap Table field. Enter **BRI200x-ISDN TA** in the Strap Type field. Then press [PGDN].

The BRI 2000 strap table appears. (See Figure 2-6.)

The screenshot shows a terminal window titled "BRI 2000/ISDN TA - Page 1 of 5". It displays a list of configuration options for various straps. The settings are as follows:

Strap Name	Current Setting	Strap Name	Current Setting
Location	Central	ISDN Switch Type	AT&T 5ESS
CMS Rate	75	ISDN Transmit Clock	Slaved
Beep on Incoming Call	Disabled		
Beep on Alarms	Disabled		
Beep on Key Press	Disabled		
Front Panel Contrast	Low		

At the bottom of the screen, there are two navigation options: "PgDn:Next Screen" and "PgUp:Prior Screen".

Figure 2-6. BRI 2000 Strap Table

- To change a strap setting, position the cursor on the strap name and press [TAB] to scroll through the possible settings.

Press [PGDN] or [PGUP] to move through the various pages of strap settings. When you finish making changes, press [PGDN] to return to the Strap Unit menu.

Modifying a Strap Table

To make changes to an existing strap table:

- From the Define Strap Table menu, select **Modify Item**.

You are prompted to enter a strap table name. If the unit already has a strap table assigned in its unit record, that name appears.

- Enter the name of the table you want to modify. You can press [TAB] to scroll through the defined tables. Then press [PGDN].
- Change strap settings as described in Step 5 of "Manually Defining a Strap Table."

Displaying List of Defined Strap Tables

The CMS 400 lets you display a list of all defined strap tables. The list contains each table's name, type, and number of associated units.

- Select **List All** from the Define Strap Table menu. A screen similar to that shown in Figure 2-7 is displayed.
- Press [PGDN] to move to subsequent pages of the display.

Name	Type	Units	Name	Type	Units
STRAP_032	Excalibur 9.6 Modems		DRS-Back	DRS Backup Table	
STRAP_034	Stat Muxes		STRAP_035	CMS TDM B/C Muxes	1
Excal	Excalibur 19.2	1	STRAP_043	Mux 800 Frac T1	2
STRAP_038	Omni 48 Modems	2	STRAP_045	CMS DSU 5XXRD	
STRAP_040	Analog Parameter		TestA	Excal DAP MP B	1
STRAP_042	Analog Parameter	1	STRAP_049	700 Backup Table	2
STRAP_041	Analog Parameter		STRAP_051	ALM3223 Modems	1
Test1	700 Backup Table		Excal_D_MP	Excalibur DAP MP	
Omnimode	Omni 96 Modems		Excal_D_SPB	Excal DAP SP B	2
STRAP_050	Bits <800, etc.>		DRS-Back	DRS Backup Table	1
Test2	Excalibur DAP SP	1	DELTA-CENT	Delta Plus Modem	2
DELTA-REMI	Delta Plus Modem	2	STRAP_055	RMD3264 3222Mode	1
RMD_Modem	RMD3264 3222Mode	1	STRAP_057	RMD3264 3222Mode	2
STRAP_044	RMD3222 Modems	2	Test	Excalibur 19.2	
STRAP_062	RMD3264 3222Mode		Test3	Omni 48 Modems	

Figure 2-7. Typical Strap Table List

Printing a Strap Table

To print existing strap tables to a hub printer, station printer, or disk file:

1. From the Define Strap Table menu, select **Print**.
2. Enter the strap table name and type. Then press [PGDN].
3. Select the destination to which you want the table printed: **None** (cancels the operation), **Hub Printer**, **Station Printer**, or **Disk File**. Then select **Enter**.

Deleting a Strap Table

To delete a strap table from the database:

1. From the Define Strap Table menu, select **Delete Item**.
2. Enter the strap table name and type. Then press [PGDN].

A confirmation message is displayed asking if you are sure you want to delete the item.

3. Enter **Y** to delete the strap table from the database.

Assigning Strap Tables

After you create the desired strap tables, you should then assign them to their intended unit(s). You can assign the same strap table to any number of units that you want to configure identically.

Starting from the CMS main window, follow these steps for each unit you want to assign a strap table to:

1. Select Database from the Commands menu.
2. Select Network Map from the adjacent menu.
3. Position the cursor on the desired unit and select Mod.
4. Enter the name of the desired strap table in the Strap Table field. Then press [PGDN].

Downloading Strap Tables

After you assign the strap tables, you can then configure units by downloading their assigned tables.

Follow these steps for each unit you want to configure:

1. From the Strap Unit menu, select Download Tables to Units.
2. Press [PGDN].

The CMS 400 then downloads each unit's assigned strap table. When the downloading is completed, each unit configures itself to match the strap table.

Changing Strap Settings

After you have configured the units in your network, you may need to change their strap settings from time to time. To change strap settings, you must do the following:

1. Read current strap settings from a unit or strap table. This places the strap settings into an edit buffer.
2. Edit the strap settings in the buffer.
3. Write the edited strap settings to the unit you want to reconfigure. (You can also write the edited strap settings to a new or existing table if desired.)

Reading Straps from Units and Tables

To read the current strap settings from any unit or strap table, select Read Straps from Unit or Read Straps from Table from the Strap Unit menu.

The CMS 400 begins reading straps from the selected unit or table. When it is finished, the screen displays Strap Data Now in Edit Area.

Editing Strap Settings

The next step is to edit the straps you just read.

1. From the Strap Unit menu, select Edit Straps Just Read.

The screen displays the strap settings just read.

2. Position the cursor on the strap(s) you want to change and press [TAB] to scroll through the possible settings.

Press [PGDN] or [PGUP] to move through the various pages of strap settings. When you've finish making changes, press [ESC] to return to the Strap Unit menu.

Writing Straps to Units and Tables

After you've edited the straps to the settings you want, you can then write them to the unit(s) you want to reconfigure.

1. From the Strap Unit menu, select Write Straps to a Unit.
2. Enter the unit(s) to which the straps are to be written and press [PGDN].

The edited strap settings are then sent to the selected unit(s).

Follow the remaining steps if you want to write the edited straps to a new or existing strap table.

3. Select Write Straps to a Table.
4. Select Create A New Strap Table or Use An Existing Strap Table.
5. At the prompt, enter the new or predefined table name. Then press [PGDN].

The edited strap settings are then written into a new or existing strap table.

Comparing Strap Settings

The CMS 400 lets you compare the strap settings of a unit or strap table with those of a second unit or strap table. This feature lets you quickly identify the differences between two sets of configurations.

1. From the Strap Unit menu, select Read Straps From Unit or Read Straps from Table (depending on the first configuration you are comparing).
2. Enter the appropriate unit or table information and press [PGDN].

The CMS 400 begins reading straps from the selected unit or table. When it is finished, the screen displays Strap Data Now in Edit Area.

3. Select Compare Straps.

The Compare Straps menu is displayed, as shown in Figure 2-8.

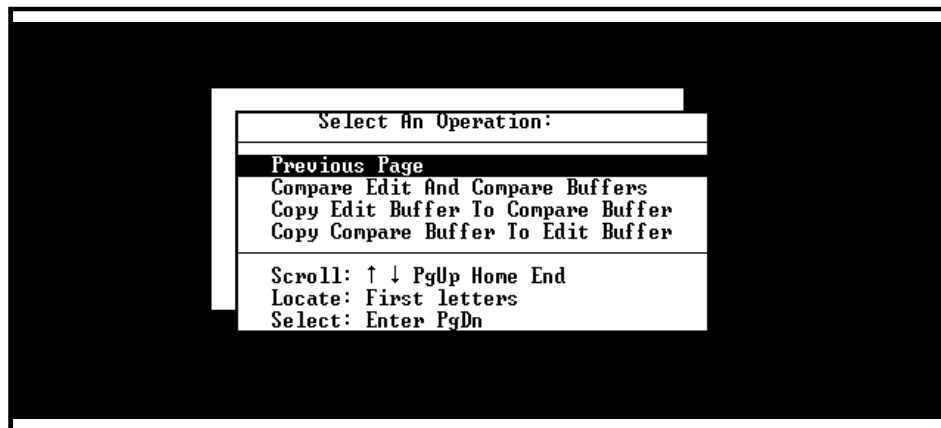


Figure 2-8. Compare Straps Menu

4. Select Copy Edit Buffer To Compare Buffer. Then return to the Strap Unit menu.

Follow Steps 1-3 for the second unit or table configuration you want to compare, and then follow Step 5.

5. Select Compare Edit And Compare Buffers.

A strap table screen is then displayed. In this screen, strap settings that do not match are displayed with white letters on a black background.

Defining the Password

The CMS 400 allows you to change the BRI 2000's password. The BRI 2000 password protection feature is used to restrict access to front panel functions. (See the BRI 2000 manual for more information.)

To define a different password:

1. From the BRI 2000 Control screen, select Numbers.
2. Select Set Units Access Password.

The Access Number Configuration screen appears. (See Figure 2-9.)

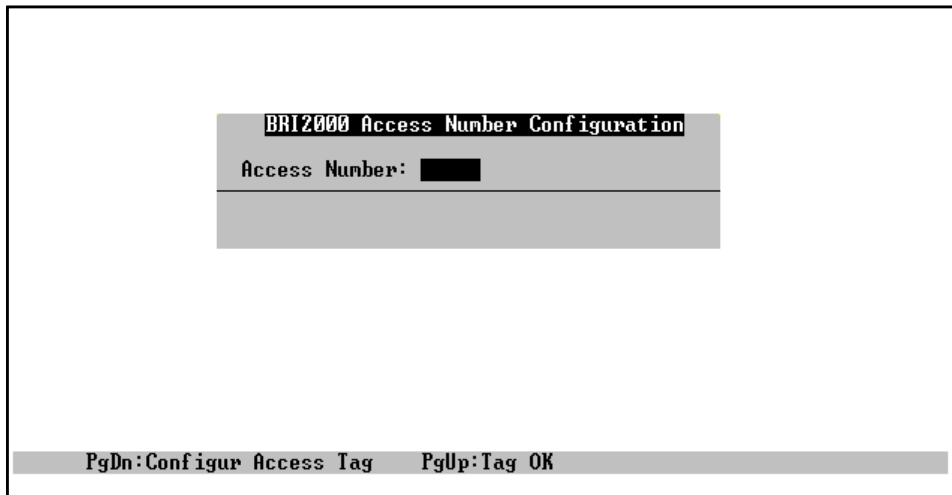


Figure 2-9. Access Number Configuration Screen

4. Press [PGDN].

The CMS 400 reads the current password from the unit and displays it on the screen.

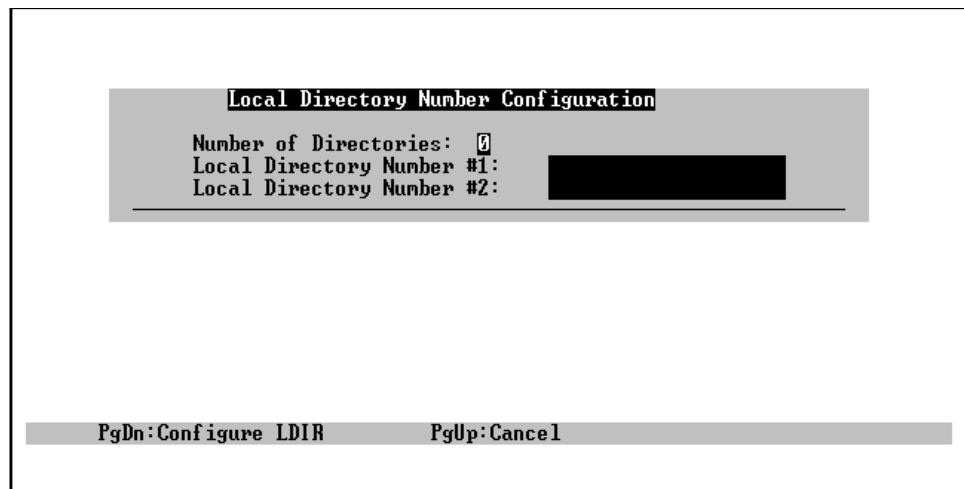
5. Enter a new password and press [PGDN] to write it to the unit.

Defining the Local Directory Number

The CMS 400 allows you to define the Local Directory Number assigned to each port. This is the telephone number assigned by your ISDN provider when you apply for ISDN Basic Rate service.

1. From the BRI 2000 Control screen, select Numbers.
2. Select Local Directory Numbers .

The Local Directory Number Configuration screen appears. (See Figure 2-10.)



```
Local Directory Number Configuration
Number of Directories: 0
Local Directory Number #1: [redacted]
Local Directory Number #2: [redacted]
PgDn: Configure LDIR      PgUp: Cancel
```

Figure 2-10. Local Directory Number Configuration Screen

4. Press [PGDN].

The CMS 400 reads the current numbers from the unit and displays them on the screen.

5. Change the numbers as desired and press [PGDN] to write the changes to the unit.

Storing Directory Numbers

The BRI 2000 can store up to 20 directory numbers per port for auto-dialing. To store directory numbers with the CMS 400:

1. From the BRI 2000 Control screen, select Numbers.
2. Select Phone Numbers.
3. You can now store phone numbers using the following options:
 - **Read From Unit** – This option reads the numbers currently stored in the BRI 2000 and places them in an edit buffer.
 - **Read From Table** – This option reads the numbers from a specified phone number table and places them in an edit buffer. (To create a new phone number table, use the Write to Table option.)
 - **Edit Configuration** – This option allows you to modify the numbers in the edit buffer.
 - **Write To Unit** – This option writes the modified numbers to the BRI 2000.
 - **Write To Table** – This option writes the modified numbers to a specified BRI 2000 phone number table. To create a new phone number table, enter a file name with a .NUM extension. The CMS 400 then creates a blank table.

Storing CLI Numbers

The BRI 2000 can store up to 20 Caller Line Identification (CLI) numbers per port. When a call is received, the unit checks the caller's phone number against the stored list of CLI numbers. It accepts the call only if the number matches one in its list.

You must select CLI numbers from the directory numbers stored for auto-dialing from the front panel. To select CLI numbers:

1. From the BRI 2000 Control screen, select Numbers.
2. Select CLI Numbers.
3. You can now select CLI numbers using the following options:
 - **Read From Unit** – This option reads the numbers currently stored in the BRI 2000 and places them in an edit buffer.
 - **Read From Table** – This option reads the numbers from a specified phone number table and places them in an edit buffer. (To create a new phone number table, use the Write to Table option.)

- **Edit Configuration** – This option allows you to modify the CLI number selections in the edit buffer. To select a directory number as a CLI number, enter **Yes** in the column next to the number. To deselect it, enter **No**.
- **Write To Unit** – This option writes the modified numbers to the BRI 2000.
- **Write To Table** – This option writes the modified numbers to a specified BRI 2000 phone number table. To create a new phone number table, enter a file name with a .NUM extension. The CMS 400 then creates a blank table.

Storing Service Profile IDs

The Service Profile Identifier (SPID) is a sequence of numbers used to identify ISDN terminal equipment to the ISDN switch. Your telephone company provides you with the SPID numbers when you order ISDN Basic Rate service. The number(s) must be entered into memory to comply with telephone company requirements.

Note: You can use the CMS 400 to store SPIDs in the central site unit only. To store SPIDs in the remote site unit, you must use the unit's front panel.

1. From the BRI 2000 Control screen, select Numbers.
2. Select Service Profile IDs.

The Service Profile ID Configuration screen appears. (See Figure 2-11.)

```
ISDN Service Profile ID Number Configuration
Number of Profile ID's: 0
Service Profile ID Number #1: [redacted]
Service Profile ID Number #2: [redacted]
-----
PgDn: Configure SPID      PgUp: Cancel
```

Figure 2-11. Service Profile ID Configuration Screen

4. Press [PGDN].

The CMS 400 then reads the SPIDs currently stored in the unit and displays them on the screen.

5. Enter the desired changes and press [PGDN] to write them to the unit.

Monitoring Unit Status

The CMS 400 allows you to monitor the EIA signal status, speed, and ISDN line status of each BRI 2000 DTE port.

1. From the BRI 2000 Control screen, select Status.

The BRI 2000 status screen appears. (See Figure 2-12.) This screen shows the EIA signal status and speed of DTE port 1. Signals are marked T (true or on), • (false or off), and * (in transition).

Time	DTE Port 1										Port Speed
	TxD	RxD	RTS	DCD	CIS	DSR	TxC	RxC	DTP	DIR	
10:06:45	.	.	.	T	T	T	T	T	.	.	64000
10:06:51	.	.	.	T	T	T	T	T	.	.	64000
10:06:56	.	.	.	T	T	T	T	T	.	.	64000
10:07:01	.	.	.	T	T	T	T	T	.	.	64000
10:07:06	.	.	.	T	T	T	T	T	.	.	64000
10:07:12	.	.	.	T	T	T	T	T	.	.	64000
10:07:17	.	.	.	T	T	T	T	T	.	.	64000
10:07:22	.	.	.	T	T	T	T	T	.	.	64000
10:07:28	.	.	.	T	T	T	T	T	.	.	64000
10:07:33	.	.	.	T	T	T	T	T	.	.	64000
10:07:38	.	.	.	T	T	T	T	T	.	.	64000
10:07:43	.	.	.	T	T	T	T	T	.	.	64000
10:07:49	.	.	.	T	T	T	T	T	.	.	64000
10:07:54	.	.	.	T	T	T	T	T	.	.	64000

ESC:Cancel 1:DTE Port 1 2:DTE Port 2 3:LINE Port 1 4:LINE Port 2
 Activity In Progress

Figure 2-12. BRI 2000 Port Status Screen

2. You now have the following options:
 - To display the EIA signal status of DTE port 2, press 2.
 - To display the ISDN line status of port 1, press 3.
 - To display the ISDN line status of port 2, press 4.
 - To return to the BRI 2000 Control menu, press [ESC].

Dial Operation

This section explains how to use the CMS 400 to originate and disconnect calls over the ISDN network.

Originating Calls

You can auto-dial up to 20 stored directory numbers per port. To store these numbers, refer to “Storing Directory Numbers” earlier in the chapter.

1. From the BRI 2000 Control screen, select Dial.
2. Select Place a Call.

The BRI 2000 Dial screen appears. (See Figure 2-13.)

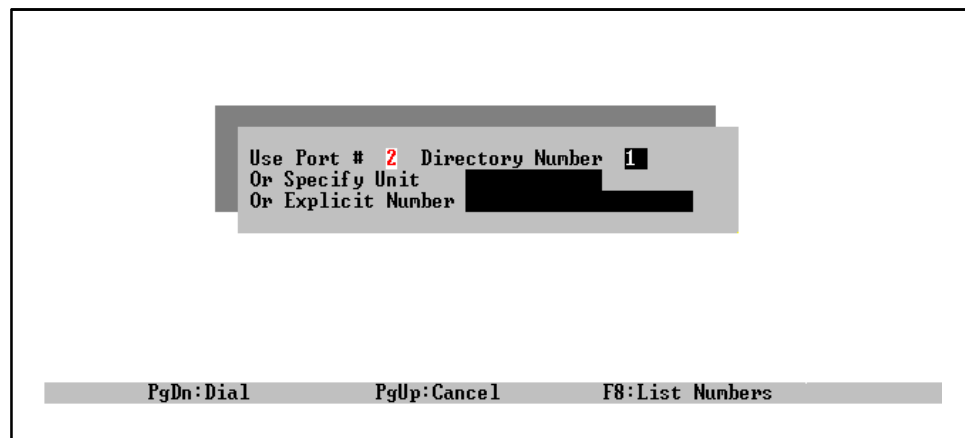


Figure 2-13. BRI 2000 Dial Screen

3. Specify the number you want to dial. You can do so in the following ways:
 - Enter the DTE port number and memory location of the stored directory number you want to dial.
 - Enter the name of the remote unit you want to dial. That unit must have a receive phone number defined in its unit record (DL1:Rx field).
 - Enter the phone number you want to dial.
 - Select F8: List Numbers to display a list of numbers stored in the unit. Select a number from the list.

4. Press [PGDN].

The CMS 400 then commands the BRI 2000 to place the call.

Originating a CMS Call

The CMS 400 allows you to command the BRI 2000 to dial a remote unit for the purpose of controlling it through CMS.

1. From the BRI 2000 Control screen, select Dial.
2. Select Place a CMS Call.
3. Specify the port you want to dial through and the unit name or phone number of the unit you want to dial.
4. Press [PGDN].

The CMS 400 then commands the BRI 2000 to place the call.

Clearing a Call

To clear an active call, select Clear Call from the Dial menu. If there is more than one port detected to be in dial, you are prompted to select the port to disconnect.

Testing

The CMS 400 allows you to perform a self-error test and digital loop test on a BRI 2000. These tests allow you to isolate and test the basic components in the system: local and remote DTEs, local and remote BRI 2000 units, and the interconnecting ISDN lines.

Note: For detailed descriptions of the tests and testing strategy, refer to the BRI 2000 manual.

Starting Self-Test

To start the self-error test:

Note: You can run a self-error test only on a central site BRI 2000.

1. From the BRI 2000 Control screen, select Test.

The Test menu appears.

2. Select Self Error Test.
3. Enter the test duration (in seconds) and press [PGDN]. (The recommended length is 60 seconds.) If you want the test to run continuously, leave the field blank.
4. Enter the port you want to run the test through and press [PGDN].

The CMS 400 then commands the unit to run the selected test. The screen shows the current test status. If you want to perform other activities while the test is still running, press [PGUP].

Starting Digital Loop Test

To start the digital loop test:

1. From the BRI 2000 Control screen, select Test.

The Test menu appears.

2. Select Loop Unit.
3. Select Loopback Digital Interface.
4. Select the port(s) you want to run the test through and press [PGDN].

The CMS 400 commands the unit to start the loop test.

Ending Tests

If you selected a timed self-error test, the test ends when the timer expires. If you selected a continuous self-error test or a digital loop test, you must end it manually. To do so, select Clear Tests from the Test menu.

Clearing Diagnostic Session

The CMS 400 communicates with remote BRI 2000 units via a diagnostic session between the central and remote BRI 2000 units. To end a diagnostic session, select Clear Diagnostic Session from the Test menu.

Monitoring Statistics

The CMS 400 allows you to precisely measure and graphically display line quality statistics for BRI 2000 units that support statistics reporting. (Units with firmware revision 7.3 and later support statistics reporting.) This feature provides useful information about ISDN line availability and quality.

BRI 2000 units can store up to 24 intervals of line statistics. Each interval is 1 hour long. (You cannot change the statistics gathering interval for BRI 2000 units.)

You can use this feature to monitor the following statistics:

- Percentage of time the D channel signal was acceptable. You can also display the number of seconds the D channel signal was unacceptable.
- Percentage of time the unit detected an acceptable ISDN receive line. You can also display the number of seconds the unit detected a receive line fault.
- Percentage of time that a network service loop was not active. You can also display the number of seconds that a network service loop was active.
- Percentage of time that the ISDN line signal quality was acceptable. You can also display the number of seconds that the signal quality was unacceptable.
- Number of far-end and near-end block errors. Far-end block errors are the CRC errors received by the telephone company central office from the reporting unit. Near-end block errors are the CRC errors received by the reporting unit from the central office.

Retrieving Statistics from Unit

To retrieve a BRI 2000 unit's stored statistics for displaying and/or storing in a file, follow these steps:

1. From the BRI 2000 Control screen, select Config.
2. Select Request Statistics from Unit.

The CMS 400 retrieves the statistics from the currently selected unit. When it is finished, it displays **Press any key to continue**. After you press a key, the Statistics Operations menu appears.

Displaying Retrieved Statistics

To display the statistics you retrieved:

1. From the Statistics Operations menu, select Display Statistics.

The CMS 400 displays the retrieved statistics in a graphic format. (See Figure 2-14.) The shaded area spanning the top of the display indicates the user-defined acceptable range for the statistic. The numbers across the bottom indicate the interval number. The letter **A** represents the average value of all intervals. The letter **C** represents the current incomplete interval.

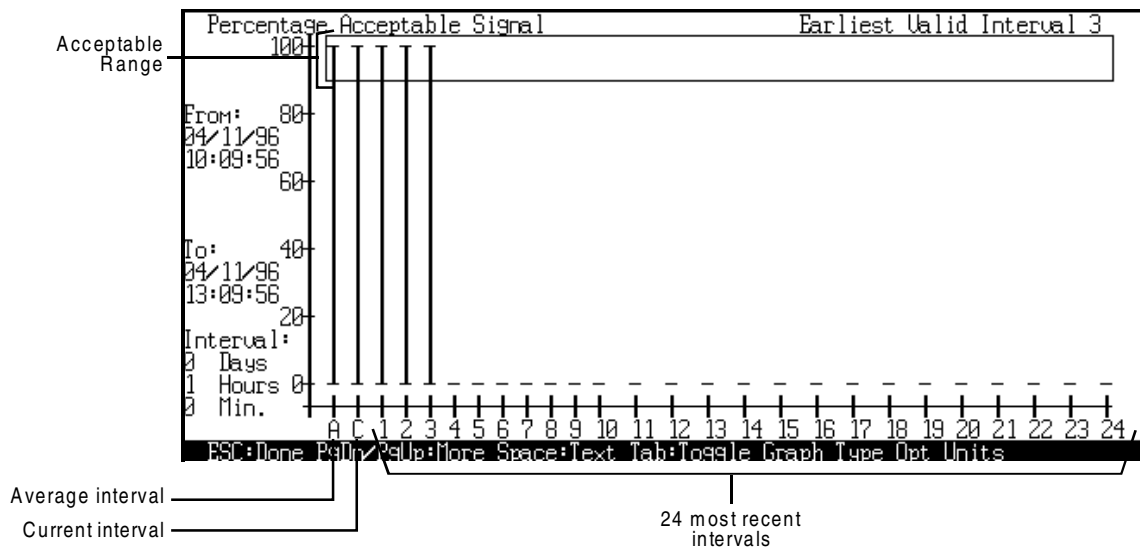


Figure 2-14. Statistics Display – Graphic Format

2. While viewing statistics, you have the following options:
 - To view the next statistic screen, press [PGDN].
 - To view the previous statistic screen, press [PGUP].
 - To toggle between the graphic display and a text display, press the space bar. Figure 2-15 shows the text display.
 - To toggle between graph types in the graphic display (vertical bar or asterisk), press [TAB].
 - To toggle between text formats in the text display (percentage of availability or seconds of unavailability), press [TAB].

- To change the thresholds that define the acceptable range displayed on the screen, select Opt. You can set the percentage threshold from 0 to 100 and the error count threshold from 0 to 300. You can also enable or disable the thresholds.
 - To display all units from which the statistics were gathered, select Units.
3. When you are done viewing the statistics, press [ESC].

Seconds Condition Was Active		Interval 0 days 1 hrs 0 min			
From 04/15/96 15:24:23		To 04/15/96 15:24:23			
Earliest Valid Interval 0					
Interval	Signal	Signal Quality	Interval	Signal	Signal Quality
Aug.	0	0	12	0	0
Now	0	0	13	0	0
1	0	0	14	0	0
2	0	0	15	0	0
3	0	0	16	0	0
4	0	0	17	0	0
5	0	0	18	0	0
6	0	0	19	0	0
7	0	0	20	0	0
8	0	0	21	0	0
9	0	0	22	0	0
10	0	0	23	0	0
11	0	0	24	0	0

ESC:Done PgDn/PgUp:More Space:Graph Tab:Toggle Percentages/Seconds Units

Figure 2-15. Statistics Display – Text Format

Storing Statistics to File

The CMS 400 allows you to store the statistics you retrieved in a statistics file. You can then view the stored statistics at a later date to analyze your ISDN line quality.

To store the retrieved statistics, select Store Results to File from the Statistics Operations menu. When the statistics are stored, the screen displays Activity Completed.

Displaying Stored Statistics

To display the statistics stored in the statistics file:

1. From the Statistics Operations menu, select Fetch Results From File.

A screen appears showing the total number of statistics entries and allowing you to select the entries you want to see.

2. If desired, enter criteria specifying the entries you want to see. You can specify a starting number, date and/or time range, or a specific central or remote unit. If you leave these fields blank, you will see all stored statistics. Then select PgDn.

The screen displays the first statistics entry number along with the date and time it occurred.

3. To view the statistics entry, press [ENTER].

The screen displays the statistics in a graphic format. You can now view these statistics in the same manner described in “Displaying Retrieved Statistics.”

Deleting Statistics File

To delete the statistics file, select **Delete Result File** from the Statistics Operations menu. A warning appears alerting you that all statistics entries will be deleted. If you are certain you want to delete the file, enter **Y**.

Resetting Unit Statistics

To reset a unit's stored statistics, select **Reset Statistics** from the Statistics Operations menu. The selected unit then starts a new statistics interval.

Using Front Panel Emulation

The CMS 400 allows you to use front panel emulation to control the BRI 2000. Front panel emulation allows you to control a unit as if you were sitting at its front panel. The screen shows you a graphic representation of the unit's front panel. You can “press” buttons using the keyboard or a mouse. You can view the front panel screen as it changes to a new display.

To use front panel emulation, select **FP_Emul** from the BRI 2000 Control screen. The CMS 400 polls the unit for its current display data and then updates the screen. (See Figure 2-16.)

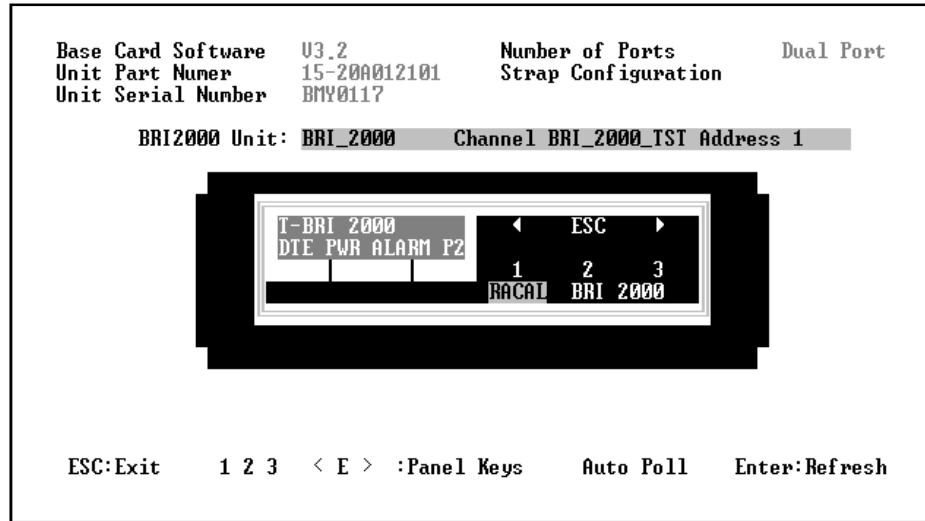


Figure 2-16. Front Panel Emulation Screen

Before you start controlling the front panel, select Auto Poll. This allows you to set the rate (in seconds) at which the CMS 400 automatically polls the unit for its current display data. You can also turn unit polling on or off.

You can "press" a front panel button in two ways: 1) click on the button with a mouse, or 2) press the matching keyboard key: 1-3, ←, →, and E (Escape). After you press a button, the screen displays Retrieving Display Data. Do not press another button until this message disappears and the screen is updated. You cannot queue up subsequent commands while a command is being sent and processed.

Chapter 3

ISX 5005/5010 Access Multiplexer

Overview

This chapter explains how to use the CMS 400 to control the ISX 5005 and 5010 digital access multiplexers. It explains how to:

- Add ports and channels to the database
- Add units to the database
- Display chassis and card information
- Configure the unit
- Monitor trunk and port status
- Initiate dial restoral operations
- Test the unit

Adding Ports and Channels

Before you can begin managing your ISX 5005/5010 multiplexers, you must configure the CMS 400 database. The first step is to add to the database the ports and channels you are using to control each unit. To do so, you must:

1. Use CMS Component Map to add and define the COM port(s) to which the EDM is connected.
2. Use CMS Component Map to add and define the EDM(s) to which the unit is connected.
3. Use CMS Component Map to add and define a channel for each connected EDM port.

Note: See the *CMS 400 Installation Manual* and the individual product manuals for instructions on making the required cable connections.

Adding COM Ports

Starting from the CMS 400 main window, follow these steps for each connected CMS 400 COM port:

1. Select Database from the Commands menu.
2. Select CMS Component Map from the adjacent menu.
3. Select Add Port.

The Add Ports screen is displayed.

4. If the COM port is connected directly to the EDM, enter **EDM On No DDM** in the Usage field.

If the COM port is connected to a DDM, enter **DDM 1-4** in the Usage field.

Note: For proper operation, the COM port must have the correct address and IRQ assigned. See the *CMS 400 User's Guide* for detailed instructions.

5. Press [PGDN] to add the COM port to the database.

Adding EDMs

Follow these steps for each EDM connected to an ISX 5005/5010 multiplexer:

1. Position the cursor on the COM port and select Add EDM.
2. Define the various fields in the Add EDM screen as desired.
3. Press [PGDN] to add the EDM to the database.

Adding Channels

You can now add and define the channels that control each unit. Follow these steps for each EDM port connected to an ISX 5005/5010 multiplexer:

1. Position the cursor on the EDM and select Channels.
2. Position the cursor on the EDM port and select Add.

The Channel Configuration screen appears. (See Figure 3-1.)

Channel Configuration			
Name ISX_CTRL	Timeout <5-99 sec> 10	Through EDM 3	Port 16
Status Online		Usage Of Channel T7	
Streaming Autosquelch On		Speed <T7 And PPP Only> 9600	
Be sure to use EDM STATUS to download channel parameters when "Usage" is changed			

Figure 3-1. Channel Configuration Screen

3. Define the fields in the screen as follows:

Name – Enter a unique name to identify the channel.

Usage of Channel – Enter **T7**.

Speed – The recommended speed is 9600 bps. This is the ISX 5005/5010 unit's default CMS speed. If there are other devices connected to the same EDM, you may need to set a lower rate to avoid overburdening the EDM. It is recommended that the sum of the CMS speeds of the devices connected to the EDM not exceed 19,200 bps.

Set other fields in the screen as desired.

4. Press [PGDN] to add the channel to the database.

Adding Units to Database

Follow these steps to add each unit to the database:

1. From the CMS 400 Main Menu, select Database.
2. Select Network Map.
3. Select Insert.
4. Define the fields in the Insert Unit screen as follows:

Name – Enter a unique name to identify the unit.

Type – Enter the appropriate unit type: ISX 5010 16-slot, 6-slot, 3-slot, or ISX 5005.

Diagnostics – Enter **T7 Standard**.

Channel – Enter the name you previously assigned to the channel controlling this unit.

Address – Set the first (leftmost) address field to match the address assigned through the unit's front panel. Leave the remaining fields blank.

Define remaining fields in the screen as desired.

4. Press [PGDN] to add the unit to the database.

Displaying the Chassis

Follow this procedure to display the units within an ISX 5005/5010 chassis. All of the procedures applicable to controlling your ISX 5005/5010 require that you first display the chassis.

1. From the CMS main window, select **Commands**.
2. Select **WAN Control** from the pulldown menu.
3. Select **ISX5010/ISX5005 Control** from the adjacent menu.

The **Select Unit by Criteria** screen appears.

4. Enter the node address, channel name, or the unique unit name and press [PGDN].

Note: If only one chassis is found in the database, you are not prompted for the unit information as described in Step 2.

The chassis is displayed. (See Figure 3-2.) This display shows the type of card installed in each slot. Note that the number of slots displayed depends on the multiplexer model.

Access Mux Control: Unit acc_mux_1

Node Name: Racal-Node12 Node Address: 255 ISDN Territory: USA

M	D	L	L	U	U	U														
u	a	B	B	o	o	o														
l	t	R	R	i	i	i														
t	a	y	y	c	c	c														
r	c	c	c	e	e	e														
u	a	a	a	c	c	c														
n	r	r	r	a	a	a														
k	d	d	d	r	r	r														
M	8	2	2	4	4	4														

ESC:Exit Alarms Zoom Versions Numbers Trunks Blacklist Configure Restoral

Figure 3-2. ISX 5010 Multiplexer Chassis View

Displaying Chassis Alarms

To display the alarm list for the ISX 5010/ISX 5005 chassis, select **Alarms** from the chassis view. These alarms must be resolved using the **Display Alarms** feature. Refer to your *CMS 400 Reference Manual* for more information.

Displaying the Software Version

To display the software version of the chassis, select **Versions** from the chassis view.

Note: It is recommended that you read the *ISX 5010 System Manual* before attempting a software upgrade. Be very careful not to disrupt a trunk when upgrading your software.

To update the revision of a card:

1. Select **Upgrade**.
2. Select the portion of software to upgrade: **Trunk system software**, **trunk control software**, **data card software**, **H/S voice card software**, **L/S voice card software**, or **complete unit upgrade**.

Displaying Individual Card Information

To retrieve detailed information about a card in any slot:

1. Display the chassis view.
2. Move the cursor to the slot in which the card resides and select **ZOOM**.

The status of the card is displayed.

3. Choose **Details** to display the port number, Tx gain, interface type and make/break percent.

Note: These parameters are read-only.

Displaying the Trunk History of a Node

This procedure allows you to display the history of events that have occurred on a unit's trunk.

From the chassis view:

1. Move the cursor to the slot in which the card resides and select **Trunks**.

The status of the trunk is displayed.

2. Select **History**.

The trunk event history within a unit is accessed.

3. Enter the end date and time of the events to be displayed and press **[PGDN]**.
4. Choose the destination to which the trunk history report is sent and press **[ENTER]**.

- If **Screen** is selected, the trunk history is displayed on the screen. The history of events are displayed with the date, time, trunk, bearer, and event. This view is used to preview the trunk history report before printing.
- If **Hub Printer** is selected, the trunk history report is queued to the hub printer.
- If **Station Printer** is selected, the trunk history report is queued to the station printer.
- If **Disk File** is selected, the trunk history report is copied to a file. You must enter the designated filename.

Unit Configuration

The following sections explain how to configure the various ISX 5005/5010 operating parameters.

Note: For detailed information about the individual parameters, refer to the appropriate ISX manual.

Configuring Node Parameters

To configure node parameters:

1. Display the chassis as previously described.
2. Select Configure.
3. Select **General Parameters** from the Node Configuration menu.

The Node Configuration screen appears.

4. You can now configure the node using the following options:
 - **Get Unit** – Displays the node parameters from the specified unit.
 - **Modify** – Allows you to modify the node parameters.
 - **Put Unit** – Allows you to write the parameters back to the unit.
 - **From Table** – Allows you to select parameters from a pre-defined strap table.
 - **To Table** – Allows you to copy modified parameters to a strap table. You can choose to copy to an existing strap table or create a new one.
 - **Copy** – Allows you to copy the configuration of one node to another.

Configuring Trunk Parameters

To configure the trunk parameters:

1. Display the chassis as previously described.
2. Select Trunks.

The status of trunk 1 is displayed. (See Figure 3-3.)

3. Select the trunk you want to configure by pressing [TAB] or 1, 2, 3, 4.

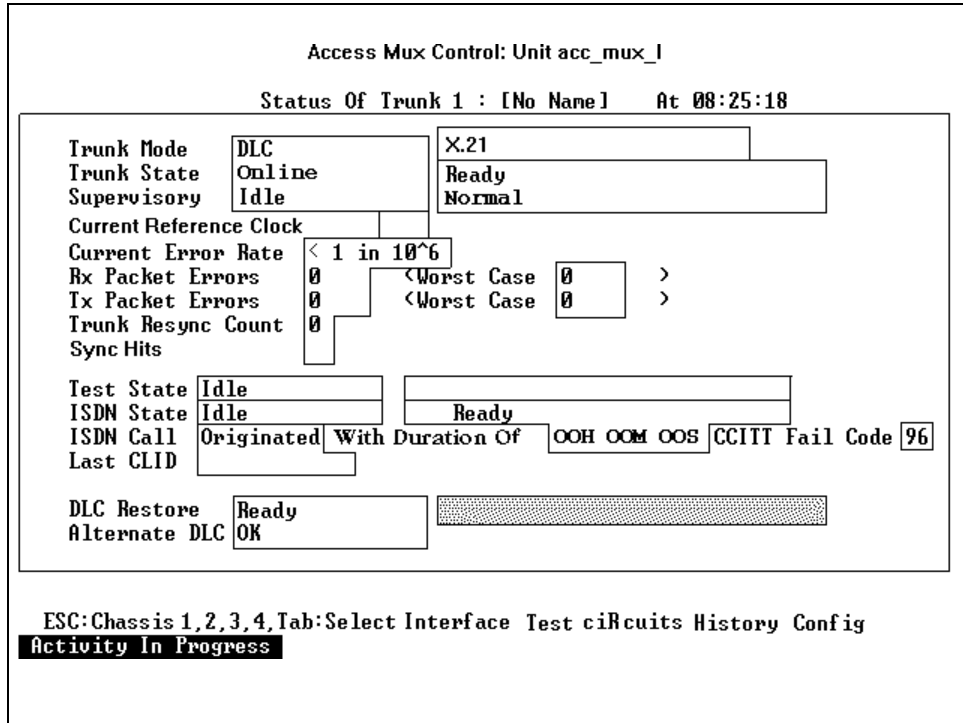


Figure 3-3. ISX 5010 Trunk Status Screen

3. Select Config.

You can now configure the selected trunk using the following options:

- **Get Unit** – Displays the trunk parameters from the specified unit.
- **Modify** – Allows you to modify the trunk parameters.
- **Put** – Allows you to write the configuration to the trunk.
- **From Table** – Allows you to copy the configuration from a pre-defined strap table.
- **To Table** – Allows you to copy the configuration to a strap table. You can choose to copy to an existing strap table or create a new one.
- **Copy** – Allows you to copy the configuration of one trunk to another.

Configuring Circuits on a Trunk

This procedure allows you to set up logical circuits across a trunk.

1. Display the chassis as previously described.
2. Select Trunks.

The status of trunk 1 is displayed.

3. Select the required trunk by pressing [TAB] or 1, 2, 3, 4.
4. Select Circuits.
5. Select Main Bearer Table or Backup Bearer Table.

The screen displays the main or backup circuit table for the local node and the node at the remote end of the selected trunk.

Note: If the trunk selected connects with a multi-trunk card, you must enter the remote trunk number.

6. You now have the following options:
 - **Modify** – Allows you to edit the circuit tables.
 - **Config** – Allows you to configure the local and remote ports on the highlighted circuit.
 - **Del all** – Deletes all circuits from the local and remote nodes for the selected trunk.
 - **Other trunk** – Allows you to access another trunk.
 - **Load remote config** – Loads the configuration of the remote node only, while the local node remains locked.

Configuring Port Parameters

To configure port parameters:

1. Display the chassis as previously described.
2. Move the cursor to the card slot and select Zoom.

The port level screen is displayed. (See Figure 3-4.)

Access Mux Control: Unit acc_mux_1
 Status Of Card 1 : Single Trunk At 09:25:12

Status	Trunk	Circuit	Table	Rate	Fallback	Test	Error
1 Attached	1	4	Main	2400	N	No Tests	0
2 Attached	1	1	Main	2400	N	No Tests	0
3 Attached	1	2	Main	2400	N	No Tests	0
4 Attached	1	3	Main	2400	N	No Tests	0
5							
6							
7							
8							

ESC:ZoomOut Tab:NextCard Interface Test Lock Unlock Config Details
 Activity In Progress

Figure 3-4. ISX 5010 Port Level Screen

3. Select Config.

You can now configure the port using the following options:

- **Get Unit** – Displays the port parameters from the specified unit.
- **Modify** – Allows you to modify the port parameters.
- **Put** – Allows you to write the parameters to the port.
- **From Table** – Allows you to copy the parameters from a pre-defined strap table.
- **To Table** – Allows you to copy the configuration to a strap table. You can choose to copy to an existing strap table or create a new one.
- **Copy** – Allows you to copy the parameters of one port to another.

Locking and Unlocking a Port for Configuration

This procedure allows you to lock or unlock a port on the chassis for configuration purposes.

From the chassis view:

1. Move the cursor to the card slot and select Zoom.

The status of the card is displayed.

2. Select a port by moving the cursor with the arrow keys.
3. Select Lock or Unlock.

Defining a Top Level Strap Table Definition

This procedure allows you to define a top level strap table definition for an ISX 5010.

1. Display the chassis as described previously.
2. Select Configure.
3. Select Entire Unit Configuration.

The Entire Unit Configuration screen is displayed.

4. Select Define Top Level Tables.
5. Enter the name of the top level strap table definition and press [PGDN].

The card complement screen is displayed.

6. Select Modify to add, remove, or change the card definitions and press [PGDN].

The port strap tables for each slot are displayed.

7. Select Modify to add, remove, or change the strap table name defined for each port and press [PGDN].

8. Select Zoom and enter the port configuration operation for a chosen strap table. Then press [PGDN].

The trunk and node strap tables are displayed.

9. Select Modify to add, remove, or change the strap table name defined for each trunk and node and press [PGDN].

10. Select Zoom to enter the trunk and node configuration operation for a chosen strap table and press [PGDN].

To modify the top level strap table definition, follow the same steps, except select Edit Top Level Tables in step 4.

Reading the Configuration into Tables

This procedure allows the entire unit configuration of an ISX 5005/5010 to be read into tables.

1. Display the chassis as described previously.
2. Select Configure.
3. Select Entire Unit Configuration from the Node Configuration menu.
4. Select Read Unit Into Tables.
5. Enter a prefix for the strap table names (e.g. AMUX and the strap tables are named AMUX00...Amuxnn; where *nn* is the table number) and press [PGDN].
6. Select either Use Existing Strap Table or Create a New Strap Table.
7. Enter the name for the top level strap table definition (e.g. the default for the above example is AMUX00).

Writing the Configuration from Tables into a Unit

This procedure allows the entire unit configuration of a multiplexer to be written from tables into an ISX 5005/5010 unit.

1. Display the chassis as described previously.
2. Select Configure.
3. Select Entire Unit Configuration.
4. Select Write Tables Into Unit.
5. Enter the name of the top level strap table definition to be written to the unit and press [PGDN].

Loading Phone, CLID, and SPID Numbers

This procedure allows you to store phone numbers, calling line ID (CLID) numbers, and SPID numbers in a unit.

From the chassis view:

1. Select Numbers.

The Manage Number menu is displayed.

2. Select Phone Numbers, Calling Line Ids, or SPID/Directory Numbers.

You can now store the selected numbers using the following options:

- **Get Unit** – Displays the numbers currently stored in the unit.
- **Modify** – Allows you to modify the numbers.
- **Put** – Allows you to write the modified numbers to the unit.
- **From Table** – Allows you to copy the numbers from a pre-defined strap table.
- **To Table** – Allows you to copy the numbers to a strap table. You can choose to copy to an existing strap table or create a new one.

Displaying Masked Phone Numbers

This procedure allows you to display phone numbers currently masked by the system.

- From the chassis view, select Blacklist.

The current blacklist phone number table is displayed. Entries marked with a check mark are masked by the system.

Note: Blacklisting rules may vary between ISDN territories.

Monitoring

The CMS 400 allows you to monitor the operating status of ISX 5005/5010 trunks and ports.

Monitoring a Trunk

This procedure allows you to monitor trunk status.

1. Display the chassis as previously described.
2. Select Trunks.

The status of trunk 1 is displayed. (See Figure 3-3.) To select a different trunk, press [TAB] or 1, 2, 3, 4.

This screen displays detailed status information for the selected trunk. Refer to the appropriate ISX multiplexer manual for explanations of these status conditions.

3. Select Interface.

The screen displays the EIA signal status for the selected trunk. (See Figure 3-5.) Table 3-1 defines the fields in the display.

Access Mux Control: Unit acc_mux_1

Status Of Trunk 1 : Bristol At 14:27:45

Trunk No Trunk St Supervis	Time	Trunk	Primary				Alternate							
			RTS	DTR	CTS	DCD	C	I	RTS	DTR	CTS	DCD	C	I
Current	14:28:56	3	.	T	.	T	.	.	.	.	.	.	.	.
Rx Packe	14:28:58	4	.	T	.	T	.	.	.	.	.	.	.	.
Tx Packe	14:29:00	1	.	T	.	T	.	.	.	.	.	.	.	.
Trunk Re	14:29:02	2	.	T	.	T	.	.	.	.	.	.	.	.
	14:29:04	3	.	T	.	T	.	.	.	.	.	.	.	.
	14:29:06	4	.	T	.	T	.	.	.	.	.	.	.	.
Test Sta	14:29:08	1	.	T	.	T	.	.	.	.	.	.	.	.
ISDN Sta	14:29:10	2	.	T	.	T	.	.	.	.	.	.	.	.
ISDN Cal	14:29:12	3	.	T	.	T	.	.	.	.	.	.	.	.
Last CLI	14:29:14	4	.	T	.	T	.	.	.	.	.	.	.	.
	14:29:16	1	.	T	.	T	.	.	.	.	.	.	.	.

DLC Restor
Alternate DLC No Clock

Any Key:Cancel

Figure 3-5. ISX 5010 Trunk EIA Status Screen

Table 3-1. ISX 5010 Trunk EIA Status Field Descriptions

Field	Description
Time	Indicates the time that the unit was monitored.
Trunks	Identifies the trunk(s) being monitored.
Primary and Alternate Signals	<p>The following signals are marked "T" for True, "." for False, and "*" for In Transition:</p> <p>RTS/C (Request To Send/Control*) DTR (Data Terminal Ready)</p> <p>CTS/I (Clear To Send/Indicate*) DCD (Data Carrier Detect)</p> <p>DSR (Data Set Ready) DSRI (Data Set Ready Interface)</p> <p>TxD (Transmit Data) RxD (Receive Data)</p> <p>TxC (Transmit Clock) RxC (Receive Clock)</p> <p>DSR (Data Set Ready Signal)</p>

* The Control and Indicate signals are valid for X.21 only.

Monitoring a Port

This procedure allows you to view a port's EIA signal status.

1. Display the chassis as previously described.
2. Position the cursor on the card slot and select Zoom.

The port level screen is displayed.

3. Select Interface.

The screen displays the EIA signal status for the selected port. If you selected a data card port, the screen appears as shown in Figure 3-6. Table 3-2 defines the fields in the display.

If you selected a voice or LBRV card port, the screen appears as shown in Figure 3-7. Table 3-3 defines the fields in the display.

Access Mux Control: Unit acc_mux_1															
Status Of Card 3 : Data Card												At 13:17:15			
Time	Port	C	I	RTS	CTSI	DTR	DSRS	DCD	CTS	DSR	DSRI	TxD	RxD	TxC	RxC
13:19:09	7	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:11	8	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:13	1	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:15	2	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:17	3	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:19	4	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:21	5	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:23	6	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:25	7	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:27	8	.	.	.	I	.	I	.	I	.	I	*	*	*	*
13:19:29	1	.	.	.	I	.	I	.	I	.	I	*	*	*	*

Any Key:Cancel

Figure 3-6. ISX 5010 Data Card Port EIA Status Screen

Table 3-2. ISX 5010 Data Card Port EIA Status Field Descriptions

Field	Description
Time	Indicates the time that the unit was monitored.
Data Card Port	Identifies the data card port being monitored.

Table 3-2. ISX 5010 Data Card Port EIA Status Field Descriptions (Continued)

Field	Description
Signals	The following signals are marked "T" for True, "•" for False, and "*" for In Transition:
RTS (Request To Send)	CTSI (Clear To Send Interface)
DTR (Data Terminal Ready)	DSRS (Data Set Ready Signal)
DCD (Data Carrier Detect)	CTS (Clear To Send)
DSR (Data Set Ready)	DSRI (Data Set Ready Interface)
TxD (Transmit Data)	RxD (Receive Data)
TxC (Transmit Clock)	RxC (Receive Clock)
C (Control; valid for X.21 only)	I (Indicate; valid for X.21 only)

Access Mux Control: Unit ISX5010 1

Status Of Card 3 : LBRU Card At 08:28:51

Status	Time	Port	E-Lead	M-Lead	Last-Digit	Error
1 Connecte	08:29:03	2	OFFHOOK	onhook	3	p 0
2 Connecte	08:29:05	1	OFFHOOK	onhook	3	p 0
3	08:29:07	2	OFFHOOK	onhook	3	
4						
5	08:29:09	1	OFFHOOK	onhook	3	
6	08:29:11	2	OFFHOOK	onhook	3	
7						
8	08:29:13	1	OFFHOOK	onhook	3	
	08:29:15	2	OFFHOOK	onhook	3	
	08:29:17	1	OFFHOOK	onhook	3	
	08:29:19	2	OFFHOOK	onhook	3	

Any Key:Cancel

Figure 3-7. ISX 5010 Voice/LBRV Card Port Signals

Table 3-3. ISX 5010 Voice/LBRV Card Port Signal Field Descriptions

Field	Description
Time	Indicates the time that the unit was monitored.
Port	Identifies the Voice or LBRV card port being monitored.
E-Lead	Indicates the status of the E (ear) lead: on-hook or off-hook.
M-lead	Indicates the status of the M (mouth) lead: on-hook or off-hook.
Last Digit	Identifies the last digit of the Voice or LBRV Card being monitored.

Restoral Operations

This procedure allows you to perform dial restoral operations on the ISX 5010/5005 multiplexer.

1. Display the chassis as previously described.
2. Select Restoral.

You now have the following options:

- **Place Call** – Allows you to place a dial backup call. You must specify the trunk number (1-9), phone number storage location (1-16), and whether you want to use a disaster table.
- **Clear Call** – Allows you to clear a dial backup call. You must specify the trunk number.
- **Switch to Backup Bearer** – Allows you to switch a trunk to a backup bearer. You must specify the trunk number.
- **Switch to Main Bearer** – Allows you to switch a trunk back to the main bearer. You must specify the trunk number.
- **Maintain a Disaster Table** – Allows you to create and modify a disaster table. This table designates up to 60 alternative circuits based on card number, port, and speed.

Testing

The CMS 400 testing operations allow you to locate, diagnose, and isolate network problems for ISX 5005/5010 multiplexers. Tests can be performed at the trunk level or the port level.

Initiating Trunk Level Tests

To initiate a test on an ISX 5005/5010 trunk:

1. Display the chassis as described previously.
2. Select Trunks.

The trunk level screen is displayed. To select a different trunk, press [TAB] or 1, 2, 3, or 4.

3. Select Test.

The Trunk Test menu is displayed.

4. Select one of the following options:

- **Initiate Local Loop** – This option places a selected trunk in a local loopback test to check for circuitry problems.
- **Initiate Remote Loop** – This option places a selected trunk in a remote loopback test to check the transmit and receive functions of both local and remote units as well as the ISDN lines (if the trunk is currently active on ISDN).
- **Transmit Data Test** – This option places a selected trunk in a transmit data test to check the transmit functions of both local and remote units.
- **Receive Data Test** – This option places a selected trunk in a receive data test to check the receive functions of both local and remote units.
- **Clear Data Test Errors** – This option clears data test errors from the trunk.
- **Clear All Tests** – This option cancels any trunk tests that are currently in progress.

Initiating Port Level Tests

To initiate a test on an ISX 5005/5010 port:

1. Display the chassis as described previously.
2. Move the cursor to the card slot and select **Zoom**.
3. Use the arrow keys to select a port.
4. Select **Test**.
5. Select one of the following options:
 - **Initiate Local Loop** – This option places a selected port in a local loopback test to check for circuitry problems.
 - **Initiate Remote Loop** – This option places a selected port in a remote loopback test to check the transmit and receive functions of both local and remote units, as well as the ISDN lines.
 - **Transmit Data Test** – This option places a selected port in a transmit data test to check the transmit functions of both local and remote units. (Available for data card ports only.)
 - **Receive Data Test** – This option places a selected port in a receive data test to check the receive functions of both local and remote units. (Available for data card ports only.)
 - **Clear Error Counter** – This option allows you to reset the error counter for a data test.
 - **Clear Tests** – This option cancels the active tests on a port.

Maintain a Disaster Table on an ISX 5010 Chassis

This procedure allows you to maintain a disaster table on the ISX 5010 chassis.

From the chassis display:

1. Select **R**estoral.
2. Select **M**aintain Disaster Table.

A screen is displayed to view, modify and delete, local and remote nodes.

ISX 5010/ISX 5005 Upgrade

The CMS 400 enables you to upgrade the software on an ISX 5010 trunk card without having to display the chassis view. This feature is designed for situations in which you need to upgrade the trunk card software when the trunk card is not fully operational. For example, if a previous trunk software upgrade failed, the trunk card will have minimal network management capabilities and be capable of communicating with CMS only to the extent that its software can be upgraded. During this upgrade, there is minimal T7 communication with the trunk card.

1. From the WAN control menu, select ISX5010/ISX5005 Upgrade.

A warning screen appears, explaining you are about to initiate a software download on a trunk card. If you want to continue, press Y.

2. Enter the type of trunk card you want to upgrade. You can press Tab to scroll through the possible cards. Then press PGDN.
3. Enter the type of trunk software you want to upgrade (System or Control). Then press PGDN.
4. Enter whether you want to lock the T7 channel during the upgrade (Yes or No). Locking the T7 channel improves the efficiency of the upgrade by preventing other applications from sending T7 commands on this channel. It is highly recommended that you lock the T7 channel when performing a trunk system software upgrade. When the upgrade is completed, the CMS 400 unlocks the channel.
5. Press PGDN to initiate the software upgrade.

ISX5314CS Software Download Upgrade

The software download function allows you to upgrade the software on an ISX5314CS card without interrupting the operation of the card. After the new software has been sent to the target unit you can choose to reboot the target unit immediately so it starts running from the new software. Or you can choose to reboot the device at a later time. Both the main software and the DLK software can be downloaded at the same time.

An application called **ISX Upgrade** supports the software upgrades. From the **Define Users** application a privilege called **Excal/ISX T1/E1 CSU Upgrade** controls whether you have the privilege to execute ISX Upgrade. If logins are enabled on the hub a check is made to see if this privilege is enabled for the current user. If you do not have the appropriate privilege the message Sorry! Insufficient Privilege is displayed and the application does not execute.

The ISX upgrade application supports all ISX5312 and ISX5314 device types listed below (both standalone and central site units):

- ISX5312 Single T1
- ISX5312 Dual T1
- ISX5312 Single E1
- ISX5312 Dual E1
- ISX5314 Single T1
- ISX5314 Dual T1
- ISX5314 Single E1
- ISX5314 Dual E1

The **Excal ISX T1/E1 CSU Control** application supports spawning the ISX Upgrade application. A function called **Upgrade** can be selected from the top level view of the application (the view that appears when the application is first invoked). The legend has been broken up into two tiers and the Upgrade selection appears on the second tier.

The **ISX5010/ISX5005 Control** application supports spawning the ISX Upgrade application. A menu item called **ISX5314CS Software** is presented in the Upgrade function menu.

To do this:

1. Select Chassis View from the ISX5010/ISX5005 Control screen.
2. Select Versions from the chassis view.
3. Select Upgrade from the version screen, when a ISX5314CS card is present in the node.

The Complete Unit Upgrade menu causes the ISX Upgrade application to be spawned if there is an ISX5314CS card present in the node. In most cases ISX Upgrade is spawned after all of the ISX5010 cards are upgraded.

After you perform a software upgrade the unit type is validated to ensure that it is one of the following CMS 400 unit types:

- ISX5312 1T1/2DTE
- ISX5312 2T1/2DTE
- ISX5312 1E1/2DTE
- ISX5312 2E1/2DTE
- ISX5314 1T1/4DTE
- ISX5314 2T1/4DTE
- ISX5314 1E1/4DTE
- ISX5314 2E1/4DTE

Note: If the unit type is not one of the above the message Selected Unit Does Not Support This Function is displayed and the function is aborted.

The selected unit is polled to determine if it actually supports software upgrades. A jumper block is read that contains a bit which if set, indicates the unit supports software upgrades. If the bit is clear the unit does not support software upgrades. Backwards compatibility with existing product in the field is ensured because the jumper block and bit that indicate software upgrade support already exists and was previously unused. Older devices always report a value of 0 for this bit meaning they do not support software upgrades. If the target unit does not support software upgrades as indicated in the jumper block, the error message Selected Unit Does Not Support This Function is displayed and the function will be aborted.

If the target unit supports software upgrades the next screen that appears is a list of the valid download images found in the CMS 400 directory of the Hub. The download image files have a file extension of .LOD. A header and trailer within the file contains information about the software version of the file as well as the type of unit the file is for. Only those files that are found which are valid for the selected unit type are listed on the screen.

The following information is presented for each .LOD file listed:

- Filename
- Type (Main or DLK)
- Version
- Size
- Date
- Time

If no valid images are found for the target unit the error message No .LOD Files Found For Target Unit is displayed and the file list will be empty.

From the listing you can choose the file to download. The current selection is identified by a highlighted bar across a row. The up and down arrows on the keyboard can be used to move the bar to a different selection. The mouse can also be used to make a selection by moving the pointer to the desired row. If there are more than 18 files found the Page Up and Page Down keys can be used to page through the file listings.

To choose a file and proceed to the next screen do one of the following:

4. Press the enter key, click on the same row that is already highlighted and click on the Upgrade selection on the legend.

or

Press the letter U.

A find function allows you to further narrow down the file list if necessary. When you choose **Find**, a prompt appears allowing a filename to be entered. The file extension entered by you must be .LOD. If the file extension entered is not .LOD the error message File Extension Must Be .LOD is displayed and you are reprompted.

Wildcards are used to find multiple files such as: 2_2_*.LOD

You can also find files located on another drive such as floppy drive A: A:2_2_*.LOD

There are limitations on the use of the Find function due to limitations in the DOS calls being used to perform the file find. The function is not intended to provide a way to enter long path names to find files in any directory. Its main purpose is to find files in the local CMS 400 directory or in the root directory of a floppy drive. The total length of the filename including path cannot exceed 12 characters.

5. Choose the file to download.
6. Select the Upgrade function from the file list screen and the target unit is polled for its software versions.

The next screen that appears shows the following information:

- Unit name of target unit
- Main software revision
- DLK software revision
- Main pending software revision if any
- Filename of selected file to download
- Software revision of selected file

At this point you can choose:

- Continue with the upgrade
- Abort and return to the file list screen

If you choose to continue the next screen prompts for whether the T7 channel should be locked during the software download. Locking the channel prevents other applications from sending T7 commands on the channel while the download is in progress. Doing this helps improve the performance of the software download by minimizing the T7 traffic on the channel.

Three new T7 commands have been designed to support sending a software image to the ISX5314:

- Software Download command is used to send the file to the target unit one block at a time.
- Software Download Status command is used to status the target unit after a software download to determine if the unit successfully stored the software to flash and is able to boot from it the next time the unit is reset.
- The Software Download Abort command is used to properly abort an in progress software download.

Precautions are taken to ensure that a unit does not get left in a software download state. For example, an abort command is always sent to the target unit if the user decides to abort an upgrade. There are cases where a unit gets left in a software download state.

For example:

- Communication failure with the unit during a download.
- A CMS 400 Hub shutdown during an upgrade.

It is also possible that a legitimate software upgrade could already be in progress on the target unit should two users mistakenly try to upgrade the same unit.

To handle the cases in which a unit might already be in a software download state the first command sent to the target unit in preparation for the start of the download will be the Software Download Status command to determine if another software download is already in progress. If the device reports that another download is in progress you will be asked if the in progress download should be aborted in favor of starting a new download. If you choose to abort the in progress software download the abort command is sent to the target unit and a new session is started as explained below.

The download is started by sending the first block of the file to the target unit using the Software Download command. If the unit is able to start the download it accepts the first block as indicated in the CXS status field of the command reply.

Once the download starts a screen displays the following information:

- Filename of the file being downloaded
- Type of file being downloaded (Main or DLK)
- Software revision of the file being downloaded
- Size of the file being downloaded
- Unit name of target unit
- Bytes sent so far
- Percent complete

The bytes sent so far and the percent complete fields are updated approximately every 5 seconds.

The legend shows the following:

ESCape: Abort Software Upgrade

If the ESCape key is entered or if the legend is clicked using the mouse the message Activity Responding...Please Wait is displayed while the application finishes processing the current outstanding command. This is followed by the message Activity Terminated and then the message Aborting Software Upgrade while the abort command is being sent to the target unit. A final status screen appears with the status message Aborted by user appearing in the final status field. The legend shows the following:

ESCape: Back To File List

Until the escape key is pressed the screen continues to show the last status of the upgrade just prior to you aborting the operation. Once the escape key is pressed the application returns to the file list screen.

If a failure occurs during the upgrade the final status screen and legend appears as described above with one of the following error messages in the final status field:

DOS file errors:

- File not found
- Invalid file path
- No file handle available
- Access to file denied
- Invalid file access code
- Unable to read file

T7 Communication errors:

- Communication failure with unit
- Communication failure with EDM
- Communication failure with DDM

Download errors reported by the unit:

- Error, loader task not initialized
- Error, loader task locked by another task
- Error, system error
- Error, initial block of file not received
- Error, missing end of file marker
- Error, aborted by CMS
- Error, invalid embedded command
- Error, missing file header
- Error, invalid file ID header
- Error, CRC verify failed
- Error, aborted due to time-out
- Error, aborted from front panel

If the upgrade completes successfully the final status screen shows one of the following messages in the final status field:

- Ready, new DLK code successfully downloaded
- Ready, pending main code will run on reboot

On success the final status screen shows the following legend:

ESCape:Back To File List Reboot Unit

If you choose not to reboot the target unit the application will return to the file list screen.

To reboot the unit at a later time, so the unit can start running from the new software you will have to execute the **Initialize** application and choose the unit(s) to send the initialize command to.

If you choose to reboot the target unit the initialize command is sent to it. The unit executes the initialize command immediately and does not send a reply back to CMS. After the initialize command has been sent the application waits for 60 seconds to elapse allowing the unit to go through its boot up initialization. Then, CMS starts polling for the unit's software revisions. The unit is polled up to 3 times after the 60 second delay. During the 60 second delay a screen appears indicating that the application is delaying.

ESCAPE: Abort Poll For Software Version

If the escape key is entered or if the legend is clicked using the mouse the message Activity Terminated is displayed and the application returns to the file list screen. If the target unit fails to respond after the 60 second delay the message Target Device Does Not Respond will be displayed and the application returns to the file list screen. If the target unit responds to the poll for its software revisions the revisions are displayed along with the revision of the file that was downloaded. At this point you can verify whether the target unit is actually running from the new software. To return to the file list screen from here you will enter the escape key.

Events will be logged to the event log to indicate success or failure of a software upgrade as follows (class 9 codes 3 and 4 are used):

9.3 Unit Software Download Succeeded: type, version

9.4 Unit Software Download Failed: type, version

Type indicates the software type downloaded: main, DLK, and version indicates the software version.

Chapter 4

DAP4000 Terminal Adapter

Overview

This chapter explains how to use the CMS 400 to control the DAP4000 series of ISDN terminal adapters and DLC (digital leased circuit) backup units. It explains how to:

- Connect the unit to the CMS 400
- Add units to the database
- Display unit information
- Configure the unit
- Monitor unit status
- Originate and disconnect dial-up calls
- Test the unit


Connecting a DAP4000 to the CMS 400

To connect the DAP4000 and all associated units to the CMS 400, use the EDM port for distribution. The T7 speed on the DAP4000 control port defaults to 75 bps, but can be configured for 1200, 2400, 4800, or 9600 bps.

Serial ports are assigned for DAP4000 usage within the CMS Component Map.

Adding a DAP4000 to the CMS 400 Database

To add a DAP4000 to the CMS 400 database:

1. From the CMS 400 main window, do one of the following:
 - Click the  toolbar button.
 - Select Database from the Commands menu. Then select Network Map from the adjacent menu.
2. Select Insert .

3. Enter a unit name for the DAP4000 Node.
4. Enter **DAP4000 Node** in the Type field, enter **T7 Standard** in the Diagnostics field, and then press [PGDN].
5. Enter the T7 channel name to which the DAP4000 will be connected.
6. Enter the T7 address of the node as defined in your DAP4000.
7. Enter any other details as required and press [PGDN].

Note: Logical Units within the DAP4000 also have to be defined and addressed via Network Map. The first diagnostic address is the node, the second is Logical Unit 1, and the third is Logical Unit 2.

8. Use Insert to add unit definitions for each Logical Unit in your DAP4000. Enter the appropriate device type: **DAP4100 ISDN TA**, **DAP4150 ISDN TA**, **DAP4500 ISDN IBU**, or **DAP4550 ISDN IBU**.

The CMS 400 can now contact the DAP4000.

Displaying the DAP4000

This procedure describes how to display a DAP4000 chassis. From this screen, you can perform all of the configuration, monitoring, and test operations applicable to the DAP4000.

1. From the CMS main window, select Commands.
2. Select WAN Control from the pulldown menu.
3. Select DAP4x00 ISDN TA Control from the adjacent menu.

The Select Unit by Criteria screen appears.

4. Enter the node address, channel name, or the unique unit name and press [PGDN].

Note: If only one unit is found in the database, you are not prompted for the unit information as described in Step 2.

Figure 4-1 is displayed.

DAP4000 Control: Unit DAP4000												
Base Card Software	3.08	Base Card Build State	Dual Port									
Approvals Territory	NET3	Option Card Fitted	IBU									
Serial Number	1606	Option Card Build State	Dual + Bypass									
Configuration Number	367B0012	ISDN Module Software	2.10									
<table border="1"> <tbody> <tr> <td>Unit CEN-DAP-NODE</td> <td>Type DAP4000 Node</td> <td>Address 10</td> </tr> <tr> <td>Unit CEN-DAP-LU1</td> <td>Type DAP4500 ISDN IBU</td> <td>Address 11</td> </tr> <tr> <td>Unit CEN-DAP-LU2</td> <td>Type DAP4500 ISDN IBU</td> <td>Address 12</td> </tr> </tbody> </table>				Unit CEN-DAP-NODE	Type DAP4000 Node	Address 10	Unit CEN-DAP-LU1	Type DAP4500 ISDN IBU	Address 11	Unit CEN-DAP-LU2	Type DAP4500 ISDN IBU	Address 12
Unit CEN-DAP-NODE	Type DAP4000 Node	Address 10										
Unit CEN-DAP-LU1	Type DAP4500 ISDN IBU	Address 11										
Unit CEN-DAP-LU2	Type DAP4500 ISDN IBU	Address 12										
<table border="1"> <tbody> <tr> <td>ESC:Exit</td> <td>Alarms</td> <td>Numbers</td> <td>Test</td> <td>Config</td> <td>Dial</td> <td>Status</td> <td>History</td> <td>Poll</td> </tr> </tbody> </table>				ESC:Exit	Alarms	Numbers	Test	Config	Dial	Status	History	Poll
ESC:Exit	Alarms	Numbers	Test	Config	Dial	Status	History	Poll				

Figure 4-1. DAP4000 Access Product Chassis

To ensure that the DAP4000 is communicating with the CMS 400:

1. Display chassis as described previously.
2. Move the cursor to the node or a Logical Unit and choose Poll.

The DAP4000 unit is polled and a message is displayed stating whether the DAP4000 responded or not.

Displaying DAP4000 Alarms

To display the alarm list for a DAP4000:

From the chassis view:

1. Move the cursor to the node or a Logical Unit.
2. Choose Alarms.

The alarms list is displayed.

The unit name in a slot is normally light blue. If at least one alarm exists for that unit, the name is highlighted in red and flashing. Likewise, the chassis itself, normally yellow, appears red if at least one chassis-oriented alarm (such as a power-supply failure) is displayed.

These alarms are resolved by using the Display Alarms feature. Refer to your *CMS 400 Reference Manual* for more information.

Displaying the Event History of a DAP4000

This procedure allows you to display the event history of a DAP4000 chassis.

From the chassis view:

1. Move the cursor to the node or Logical Unit, and select History.

The event history is accessed and displayed for the specified unit. The events displayed include the date, time, code, and actual event text (refer to Figure 4-2).

DAP4000 Control: Unit dap4000			
Date	Time	Code	Event
03.09.93	14:11:00	70	Trunk /Down
03.09.93	14:11:00	100	ISDN Call Set-Up
03.09.93	14:11:00	98	DTE Output Control Signal Change
03.09.93	14:11:00	83	DLC Available For Restoral
03.09.93	14:15:00	97	Non-CMS Configuration Change
03.09.93	14:16:00	99	Call Cleared Normally
03.09.93	14:17:00	108	Test Initiated

ESC:Exit PgDn:More Events Home:First Event Del:Clear All Ins:Clear Read

Figure 4-2. DAP4000 History Information

2. Use the bottom key legend to move through and manipulate the events. You may view and delete any event from this screen.

Unit Configuration

The following sections explain how to configure DAP4000 operating parameters.

Configuring the Profile Parameters

To modify the profile information of a DAP4000:

1. Display the chassis view as described previously.
2. Move the cursor to a Logical Unit, and select Config.

The Configuration TA/IBU screen is displayed.

3. Select Configuration By Profile.

You have the following options in which to change the profile of a DAP4000 unit:

- **Read From Unit** - This option reads the profile information from the DAP4000 unit.
- **Read From Table** - This option reads the profile information from the DAP4000 unit table.
- **Edit Configuration** - This option displays the profile information and allows you to modify the parameters.
- **Write To Unit** - This option writes the profile information to the DAP4000 unit.
- **Write To Table** - This option writes the profile information to the DAP4000 unit table.

Configuring the Profile-Independent Parameters

To modify the profile-independent parameters of a DAP4000:

1. Display the chassis view as described previously.
2. Move the cursor to a Logical Unit, and select Config.
3. Select Profile-Independent Parameters from the Configuration TA/IBU screen.

The following options become available:

- **Read From Unit** - This option reads the profile-independent parameters from the DAP4000 unit.
- **Read From Table** - This option reads the profile-independent parameters from the DAP4000 unit table.
- **Edit Configuration** - This option displays the profile-independent parameters and allows you to modify their settings.
- **Write To Unit** - This option writes the profile-independent parameters to the DAP4000 unit.
- **Write To Table** - This option writes the profile-independent parameters to the DAP4000 unit table.

Copying a Profile to Another Profile

To copy the profile of a DAP4000 Logical Unit to another profile:

1. Display the chassis as described previously.
2. Move the cursor to a Logical Unit, and select **Config**.
3. Select **Copy Profile To Profile** from the Configuration TA/IBU screen.

You are prompted to select the profile to copy from and to.

4. Select the desired profiles by pressing [TAB] and [PGDN].

The specified profile is copied.

Configuring General Parameters

To modify the general parameters of the DAP4000:

1. Display the chassis as previously described.
2. Move the cursor to the node, and press **Config**.
3. Select **General Parameters** from the Node Configuration screen.

The following options become available:

- **Read From Unit** - This option reads the general parameters from the DAP4000 node.

- **Read From Table** - This option reads the general parameters from the DAP4000 Node table.
- **Edit Configuration** - This option displays the general parameters for modification.
- **Write To Unit** - This option writes the general parameters to the DAP4000 node.
- **Write To Table** - This option writes the general parameters to the DAP4000 Node table.

Configuring the Entire Unit Configuration

To modify the entire unit configuration:

1. Display the chassis as previously described.
2. Move the cursor to the Node, and choose **Config**.
3. Select **Entire Unit Configuration**.

The following options become available:

- **Upload Entire-Unit Config** - This option uploads the entire unit configuration from the DAP4000 unit.
- **Download Entire-Unit Config** - This option downloads the entire unit configuration to the DAP4000 unit.
- **Read Entire-Unit Definition** - This option reads the entire unit configuration definition into the edit buffer.
- **Edit Entire-Unit Definition** - This option displays the entire unit configuration definition and allows you to modify the settings.
- **Write Entire Unit Definition** - This option writes the entire unit configuration definition to a table.

Loading Phone and CLI Numbers into a Logical Unit

This procedure allows you to store phone numbers and CLI numbers in DAP4000 Logical Unit.

1. Display the chassis as previously described.
2. Move the cursor to the Logical Unit and select Numbers.
3. Select Phone Numbers or Calling Line Ids from the Manage Numbers screen.

The following options become available:

- **Read From Unit** - This option reads the numbers from the DAP4000 Logical Unit.
- **Read From Table** - This option reads the numbers from a CMS 400 DAP4000 table.
- **Edit Configuration** - This option allows you to modify the numbers.
- **Write To Unit** - This option writes the numbers to the DAP4000 Logical Unit.
- **Write To Table** - This option writes the numbers to a CMS 400 DAP4000 table.

Loading the CMS Phone Number

This procedure allows you to store a CMS phone number in a DAP4000 Logical Unit. The CMS phone number is used to dial another unit for the purpose of controlling it through CMS.

1. Display the chassis as described previously.
2. Move the cursor to the node, and select Numbers.
The Node Specific Telephone Codes screen is displayed.
3. Type the CMS phone number and press the down arrow key.
4. Type your comment and press the down arrow key.
5. Type the sub-address and press the down arrow key.
6. Type the profile and press [PGDN].

The system loads the CMS phone numbers into the DAP4000.

Auto Loading the Remote Addresses of a Logical Unit

To automatically load the remote addresses of a DAP4000:

1. Display the chassis as described previously.
2. Move the cursor to a Logical Unit and choose Config.
3. Select Autoload Remote Addresses from the Configuration TA/IBU screen.

The remote unit addresses of the DAP4000 are automatically loaded. The system sets the empty downstream address list if no remote units are defined on the Network Map. Refer to the management section of the DAP4000 Manual for more information.

Editing the Remote Addresses

To edit the remote unit addresses of a DAP4000:

1. Display the chassis as described previously.
2. Move the cursor to a Logical Unit and choose Config.
3. Select Edit Remote Addresses from the Configuration TA/IBU screen.
4. Modify the remote downstream unit addresses as desired.

Masking Alarms

To mask the alarms of a DAP4000 Node or Logical Unit:

1. Display the chassis as previously described.
2. Move the cursor to the node or a Logical Unit and choose Config.
3. Select Alarm Masking from the configuration screen.

The following options become available:

- **Read From Unit** - This option reads the alarm masking information from the DAP4000.
- **Read From Table** - This option reads the alarm masking information from the DAP4000 table.
- **Edit Configuration** - This option displays the alarm masking information for modification.

- **Write To Unit** - This option writes the alarm masking information to the DAP4000.
- **Write To Table** - This option writes the alarm masking information to the DAP4000 table.

Modifying the Internal Log

To modify the way in which the internal log is displayed for a node or Logical Unit:

1. Display the chassis as described previously.
2. Move the cursor to the node or a Logical Unit and choose Config.

The configuration screen is displayed.

3. Select Internal Log Control.

The following options become available:

- **Read From Unit** - This option reads the internal log masking from the DAP4000.
- **Read From Table** - This option reads the internal log masking information from the DAP4000 table.
- **Edit Configuration** - This option displays the internal log masking information for modification.
- **Write To Unit** - This option writes the internal log masking information to the DAP4000.
- **Write To Table** - This option writes the internal log masking information to the DAP4000 table.

Monitoring Unit Status

The CMS 400 allows you to monitor the current operating status of the DAP4000 units.

1. Display the chassis as previously described.
2. Move the cursor to a Logical Unit.
3. Select Status.

The status of the card is displayed (refer to Figure 4-3).

DAP4000 Control: Unit UNIT_00025											
Time	DTE <U24/U28/U35>					TxD	RxD	TxC	RxC	ISDN	State
	CTS	DCD	DSR	RTS	DTR							TMI
15:22:39	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:41	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:43	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:45	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:47	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:49	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:51	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:53	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:55	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:57	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:22:59	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:23:01	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:23:03	T	T	T	T	T	*	*	*	*	Offline And Ready	
15:23:05	T	T	T	T	T	*	*	*	*	Offline And Ready	

IBU Status	ESC:Cancel	DTE/DLC Signals
Activity In Progress		

Figure 4-3. DAP4000 Card Status Screen

Note: The display format is automatically set by the interface used by the DAP4000 (e.g. V.24/V.28/V.38 or V.11)

Refer to Table 4-1 for a description of the fields.

Table 4-1. DAP4000 Status Screen Field Descriptions

Field	Description														
Time	Indicates the time that the unit was monitored.														
Signals	<p>The following signals are marked "T" for True, "*" for False, _ for no signal, and "*" for In Transition:</p> <table border="0"> <tr> <td>CTS (Clear To Send)</td> <td>DCD (Data Carrier Detect)</td> </tr> <tr> <td>DSR (Data Set Ready)</td> <td>RTS (Request To Send)</td> </tr> <tr> <td>DTR (Data Terminal Ready)</td> <td>TMI (Test Mode Indicate)</td> </tr> <tr> <td>TxD (Transmit Data)</td> <td>RxD (Receive Data)</td> </tr> <tr> <td>TxC (Transmit Clock)</td> <td>RxC (Receive Clock)</td> </tr> <tr> <td>C (Control)</td> <td>I (Indicate)</td> </tr> <tr> <td>ISDN State (Status of ISDN)</td> <td></td> </tr> </table>	CTS (Clear To Send)	DCD (Data Carrier Detect)	DSR (Data Set Ready)	RTS (Request To Send)	DTR (Data Terminal Ready)	TMI (Test Mode Indicate)	TxD (Transmit Data)	RxD (Receive Data)	TxC (Transmit Clock)	RxC (Receive Clock)	C (Control)	I (Indicate)	ISDN State (Status of ISDN)	
CTS (Clear To Send)	DCD (Data Carrier Detect)														
DSR (Data Set Ready)	RTS (Request To Send)														
DTR (Data Terminal Ready)	TMI (Test Mode Indicate)														
TxD (Transmit Data)	RxD (Receive Data)														
TxC (Transmit Clock)	RxC (Receive Clock)														
C (Control)	I (Indicate)														
ISDN State (Status of ISDN)															

4. If the Logical Unit is a DAP4500/4550 and is configured as an IBU, you can change the display by selecting one of these options from the bottom legend:

- **DTE/DLC Signals** - Displays the digital leased circuit (DLC) signal status.
- **IBU Status** - Displays the dial backup status of the unit. (See Figure 4-4 for an example.)

DAP4000 Control: Unit UNIT_00025											
DTE <U24/U28/U35>											
Time	CTS	DCD	DSR	RTS	DTR	TMI	TxD	RxD	TxC	RxC	ISDN State
15:25:45	T	.	T	.	.	.	*	-	*	-	Online: Answered On B1
15:25:47	T	.	T	.	.	.	*	-	*	-	Online: Answered On B1
15:25:49	T	.	T	.	.	.	*	-	*	-	Online: Answered On B1
15:25:51											: Answered On B1
15:25:53	IBU Status At 15:29:51										Answered On B1
15:25:55	Current DLC Health OK, No Failure Criteria										Answered On B1
15:25:57	Reason For Failure None										Answered On B1
15:25:59	IBU Data Routeing Over ISDN										Answered On B1
15:26:01	IBU Activity Idle										Answered On B1
15:26:03											Answered On B1
15:26:05											Answered On B1
15:26:07	T	.	T	.	.	.	*	-	*	-	Online: Answered On B1
15:26:09	T	.	T	.	.	.	*	-	*	-	Online: Answered On B1
15:26:11	T	.	T	.	.	.	*	-	*	-	Online: Answered On B1

Any Key:Cancel

Activity In Progress

Figure 4-4. DAP4500 IBU Information

Dial Operation

The CMS 400 allows you to originate and disconnect dial-up calls for the DAP4000.

1. Display the chassis as previously described.
2. Move the cursor to a Logical Unit and choose Dial.

The Dial Operation menu provides you with three options:

- **Place Call** - Allows you to place a dial-up call. You must specify either a directory entry, a unit name, or a phone number to dial.

- **Call for CMS** - Allows you to call a unit for the purpose of controlling it through CMS. You must specify either a directory entry, a unit name, or a phone number to dial.
- **Clear Call** - Allows you to clear an active dial-up call.

Testing

The CMS 400 testing operations allow you to locate, diagnose, and isolate network problems.

To perform the various tests on the DAP4000:

1. Display the chassis as described previously.
2. Move the cursor to a Logical Unit and choose Test.

The Test Option screen provides you with the following choices:

- **Local Digital Loop** - This option places the DAP4000 in a local digital loopback to check for circuitry problems.
- **Remote Digital Loop** - This option places the DAP4000 in a remote digital loopback. This test checks the transmit and receive functions of both local and remote units as well as the telephone lines.
- **Start Error Test** - This option places a DAP4000 in an error test to check its transmit and receive functions.
- **Return to Error Test** - This option redisplay an active error test screen while the system is polling the DAP4000 for its error test count.
- **Clear Tests** - This option cancels tests that are currently in progress on a DAP4000 Logical Unit.
- **Local Node Loop** - This option places the DAP4000 in a Local Node Loopback test. This test checks the unit when combined with an error test or checks the transmit and receive operations with the other units connected to both Logical Units.
- **Clear Node Loop** - This option cancels a local node loop test that is currently in progress on the DAP4000.

Overview

This chapter explains how to use the CMS 400 to control the DAP MS20 ISDN terminal adapter. It explains how to:

- Add ports and channels to the database
- Add units to the database
- Display unit information
- Configure the unit
- Store phone numbers in the unit
- Originate and disconnect calls
- Monitor operating status
- Test the unit

Adding Ports and Channels

Before you begin managing your DAP MS20 units, you must configure the CMS 400 database. The first step is to add to the database the ports and channels you are using to control each unit. To do so, you must:

1. Use CMS Component Map to add and define the COM port(s) to which the EDM is connected.
2. Use CMS Component Map to add and define the EDM(s) to which the unit is connected.
3. Use CMS Component Map to add and define a channel for each connected EDM port.

Note: See the *CMS 400 Installation Manual* and the *DAP MS20 Manual* for instructions about connecting the DAP MS20 to an EDM port.

Adding COM Ports

Starting from the CMS 400 main window, follow these steps for each connected CMS 400 COM port:

1. Select Database from the Commands menu.
2. Select CMS Component Map from the adjacent menu.
3. Select Add Port.

The Add Ports screen is displayed.

4. If the COM port is connected directly to the EDM, enter **EDM On No DDM** in the Usage field.

If the COM port is connected to a DDM, enter **DDM 1-4** in the Usage field.

Note: For proper operation, the COM port must have the correct address and IRQ assigned. See the *CMS 400 User's Guide* for detailed instructions.

5. Press [PGDN] to add the COM port to the database.

Adding EDMs

Follow these steps for each EDM connected to a DAP MS20:

1. Position the cursor on the COM port and select Add EDM.
2. Define the various fields in the Add EDM screen as desired.
3. Press [PGDN] to add the EDM to the database.

Adding Channels

You can now add and define the channels that control each unit. Follow these steps for each EDM port connected to a DAP MS20:

1. Position the cursor on the EDM and select Channels.
2. Position the cursor on the EDM port and select Add.

The Channel Configuration screen appears. (See Figure 5-1.)

Channel Configuration

Name BRI_CTRL	Timeout <5-99 sec> 10	Through EDM 3	Port 16
Status Online		Usage Of Channel T7	
Streaming Autosquelch On		Speed <T7 And PPP Only> 19200	

Be sure to use EDM STATUS to download channel parameters when "Usage" is changed

Figure 5-1. Channel Configuration Screen

3. Define the fields in the screen as follows:

Name – Enter a unique name to identify the channel.

Usage of Channel – Enter **T7**.

Speed – The recommended speed is 19,200 bps. The DAP MS20 CMS Rate parameter must also be set to 19,200 bps. If there are other devices connected to the same EDM, you may need to set a lower rate to avoid overburdening the EDM. It is recommended that the sum of the CMS speeds of the devices connected to the EDM not exceed 19,200 bps.


Set other fields in the screen as desired.

4. Press [PGDN] to add the channel to the database.

Adding Units to Database

Follow these steps to add each unit to the database:

1. From the CMS 400 main window, do one of the following:

- Click the  toolbar button.
- Select Database from the Commands menu. Then select Network Map from the adjacent menu.

2. Select Insert.

The Insert Unit screen appears. (See Figure 5-2.)

The screenshot shows a terminal-style interface for adding a unit. At the top, three labels indicate where to enter information: 'Enter unique name' above the Name field, 'Enter DAPMS20' above the Type field, and 'Enter T7 Standard' above the Diagnostics field. The Name field contains 'MS20_cent', Type contains 'DAPMS20', and Diagnostics contains 'T7 Standard'. Below these are fields for 'Channel Address' (containing 'MS20_ctrl') and 'Serial Number Strap Table'. A section labeled 'Enter unit's local address' points to the first field of the 'Address' field. The 'Phones' section has 'DL1: Rx' and 'DL2: Tx'. The 'Groups' section has two empty fields. The 'Alarms' section has a 'Test' button. The 'Site' section has 'Backup Type', 'Backup Table', 'Health Table', 'Upstream Port', 'Offline' (set to 'N'), and 'Fetch Stats' (set to 'No'). At the bottom, a grey bar contains the instructions 'PgDn:Accept Input' and 'PgUp:Retract Input'.

Figure 5-2. Insert Unit Screen

4. Define the fields in the Insert Unit screen as follows:

Name – Enter a unique name to identify the unit.

Type – Enter **DAPMS20**.

Diagnostics – Enter **T7 Standard**.

Channel – For central units connected to an EDM, enter the name you previously assigned to the channel controlling this unit. For remote units, leave this field blank.

Address – Set the first (leftmost) address field to match the address assigned through the unit's front panel. Leave the remaining fields blank.

Define remaining fields in the screen as desired.

5. Press [PGDN] to add the unit to the database.

Displaying Unit Information

The CMS 400 allows you to display basic information about each DAP MS20 in your network. This information includes the unit's part number, software revision, and option type.

1. From the CMS main window, select Commands.
2. Select WAN Control from the pulldown menu.
3. Select DAP MS20 from the adjacent menu.

The Select Unit by Criteria screen appears.

4. Enter information to specify the unit you want to display and press [PGDN].

Note: If only one unit is found in the database, you are not prompted for the unit information as described in Step 2.

The DAP MS20 Control Screen appears. (See Figure 5-3.) This screen shows a graphic display of the DAP MS20 front panel. If a DCE+ device is attached to the DAP MS20, the screen shows the front panel of that device as well. The top of the screen provides basic unit information. The bottom of the screen provides the various operations you can select.

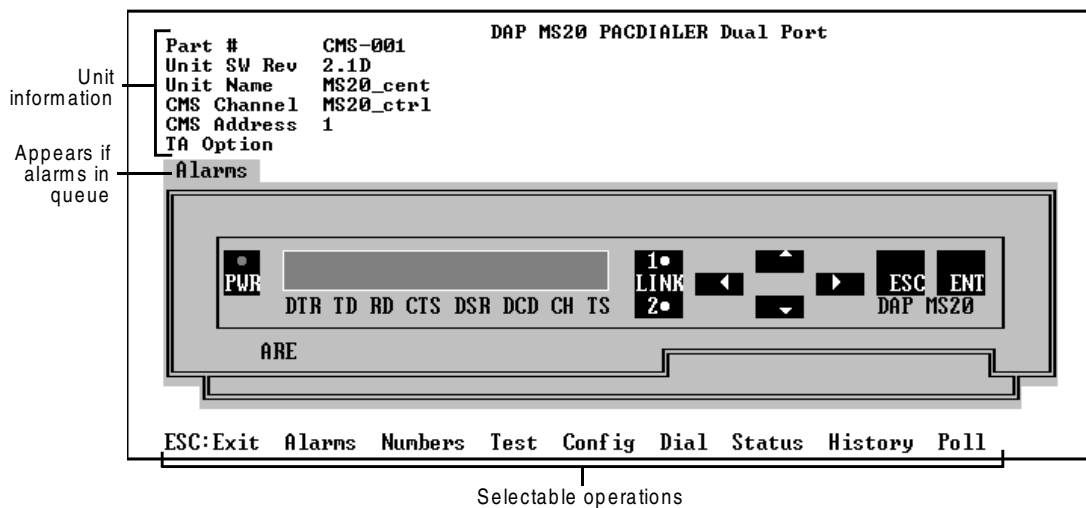


Figure 5-3. DAP MS20 Control Screen

Polling the Unit

To ensure that the DAP MS20 is communicating with the CMS 400, select **Poll** from the bottom legend. A response is returned indicating whether or not the unit responded to the poll.

Displaying Alarms

If alarms are stored in the CMS 400 alarm queue, **Alarms** appears in red above the top left corner of the unit. To view these alarms, select **Alarms** from the bottom legend. Any alarms associated with the unit are displayed. Refer to the *CMS 400 Reference Manual* for information on resolving alarms.

Displaying Event History

The CMS 400 allows you to display the history of events that have occurred in a DAP MS20 unit or attached DCE+ device.

1. Select **History** from the bottom legend.
2. Select the source of the events you want to display: stored alarms (from DAP MS20) or DCE+ events.

The selected event history appears.

3. You can now select any of the following options:

Zoom – Displays more detailed information about the currently highlighted event.

Clear – Erases all events from the unit event log.

Spa – Toggles the highlighted event between a marked and unmarked state.

Ins – Marks all events.

Del – Unmarks all events.

Transfer-clear – Saves all marked events in the alarm queue and then clears the unit event log.

Unit Configuration

To configure the DAP MS20, you must use the DAP MS20 application. You cannot use the standard Strap Unit function to configure this unit.

To configure a DAP MS20:

1. From the DAP MS20 Control screen, select Config.
2. You can now configure the unit using the following options:
 - **Read From Unit** – Reads the unit’s current parameter settings into an edit buffer. You can specify which configuration items you want to read.
 - **Read From Table** – Reads the current parameter settings from a specified strap table into an edit buffer. You can specify which configuration items you want to read.
 - **Edit Configuration** – Displays the parameters in the edit buffer and allows you to change their settings.
 - **Write To Unit** – Writes the parameter settings from the edit buffer to a specified unit. You can specify which configuration items you want to write.
 - **Write To Table** – Writes the parameter settings from the edit buffer to a specified strap table. You can specify which configuration items you want to write.
 - **Save Current Profile** – Saves the unit’s current parameter settings as one of four user-defined configuration profiles (12-15). Profiles allow you to quickly switch to an alternate configuration without having to reset individual parameters.
 - **Load Profile** – Writes a specified user-defined profile (12-15) or factory profile (0-11) to a specified unit.
 - **Init Factory Profile** – Sets the profile-independent parameters to their default values and loads the default profile (8) into the active profile.
 - **TA Reset** – Re-initializes the unit.

Storing Phone Numbers

The CMS 400 allows you to store 20 phone numbers and 40 caller line identification (CLI) numbers for each DAP MS20 port. You can store phone numbers for both the terminal adapter and the backup unit (if applicable).

1. From the DAP MS20 Control screen, select Numbers.
2. Select the port and the type of numbers you want to store: TA (terminal adapter), CLI, or BU (backup unit).
3. You can now store numbers using the following options:
 - **Read From Unit** – Reads the numbers currently stored in the unit and places them in an edit buffer.
 - **Read From Table** – Reads the numbers from a specified phone number table and places them in an edit buffer. (To create a new phone number table, use the Write to Table option.)
 - **Edit Configuration** – Allows you to modify the numbers in the edit buffer.
 - **Write To Unit** – Writes the modified numbers to the unit.
 - **Write To Table** – Writes the modified numbers to a specified phone number table. To create a new phone number table, enter a file name with a .NUM extension. The CMS 400 then creates a blank table.

Dial Operation

This section explains how to use the CMS 400 to originate and disconnect calls over the ISDN network.

Originating Calls

You can auto-dial up to 20 stored phone numbers per port. To store these numbers, refer to the previous section, “Storing Phone Numbers.”

1. From the DAP MS20 Control screen, select Dial.
2. Select Place a Call.

The Dial screen appears. (See Figure 5-4.)

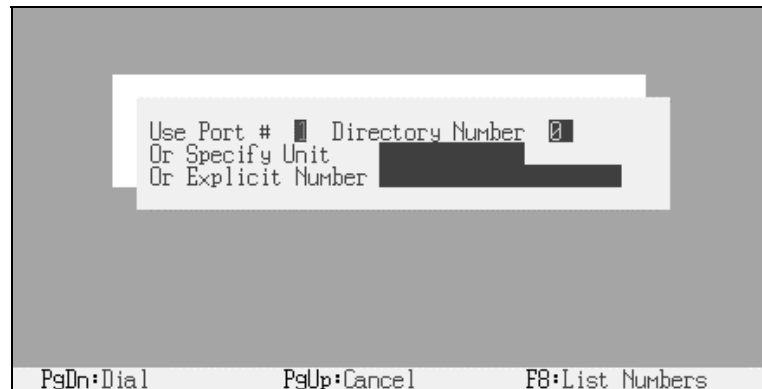


Figure 5-4. Dial Screen

3. Specify the number you want to dial. You can do so in the following ways:
 - Enter the DTE port number and memory location of the stored directory number you want to dial.
 - Enter the name of the remote unit you want to dial. That unit must have a receive phone number defined in its unit record (DL1:Rx field).
 - Enter the specific phone number you want to dial.
 - Select F8: List Numbers to display a list of numbers stored in the unit. Select a number from the list.
4. Press [PGDN].

The CMS 400 commands the unit to place the call.

Originating a CMS Call

The CMS 400 allows you to command the DAP MS20 to dial a remote unit for the purpose of controlling it through CMS.

1. From the DAP MS20 Control screen, select Dial.
2. Select Call for CMS.
3. Specify the port you want to dial through and the unit name or phone number of the unit you want to dial.
4. Select PgDn.

The CMS 400 commands the unit to place the call.

Switching to Dedicated Line

The CMS 400 allows you to switch a DAP MS20 from the dial lines back to the dedicated lines. To do so, select **Switch to Dedicated** from the Dial menu.

Clearing a Call

To clear an active call, select **Clear Call** from the Dial menu. If there is more than one port detected to be in dial, you are prompted to select the port to disconnect.

Monitoring

The CMS 400 allows you to monitor the current status of each DAP MS20 DTE and DCE port.

1. From the DAP MS20 Control screen, select **Status**.
2. Select the port you want to monitor and select **PgDn**.

The Status screen appears. (See Figure 5-5.) This screen shows the EIA signal status and speed of the selected port. Signals are marked T (true or on), • (false or off), and * (in transition).

Time	DTE Port 1									Port Speed
	TI	DCD	CTS	RTS	DSR	DTR	R/C	D/L	RI	
16:45:27	.	*	*	*	T	.	C	.	.	64000
16:45:30	.	T	T	.	T	.	C	.	.	64000
16:45:33	.	T	T	.	T	.	C	.	.	64000
16:45:36	.	T	T	.	T	.	C	.	.	64000
16:45:40	.	T	T	.	T	.	C	.	.	64000
16:45:43	.	T	T	.	T	.	C	.	.	64000
16:45:46	.	T	T	.	T	.	C	.	.	64000
16:45:49	.	T	T	.	T	.	C	.	.	64000
16:45:53	.	T	T	.	T	.	C	.	.	64000
16:45:55	.	T	T	.	T	.	C	.	.	64000
16:45:58	.	T	T	.	T	.	C	.	.	64000
16:46:02	.	T	T	.	T	.	C	.	.	64000
16:46:05	.	T	T	.	T	.	C	.	.	64000
16:46:08	.	T	T	.	T	.	C	.	.	64000

ESC:Cancel 1:DTE Port 1 2:DTE Port 2 3:LINE Port 1 4:LINE Port 2
 Activity In Progress

Figure 5-5. Status Screen

3. You now have the following options:

- To display the EIA signal status of DTE port 2, press 2.
- To display the ISDN line status of port 1, press 3.
- To display the ISDN line status of port 2, press 4.
- To return to the DAP MS20 Control menu, press [PGDN].

Testing

The CMS 400 allows you to run the following tests on DAP MS20 units:

- Analog loop test (L3 A)
- Digital loop test (L3 C)
- Remote digital loop test (V54 L2 R)

Note: For detailed descriptions of the individual tests and testing strategy, refer to the *DAP MS20 Manual*.

Starting Tests

To start a DAP MS20 test:

1. From the MS20 Control screen, select **Test**.

The Test menu appears.

2. Select the test you want to run.

The CMS 400 commands the unit to start the selected test.

Ending Tests

To end an active test, go to the Test menu and select **Clear Test**. All active tests are cleared.

Index

A

- Access Number Configuration screen..... 2-14
- Add Ports screen2-2, 3-2, 5-2
- Address, entering in database.....2-4, 3-4, 5-4
- Alarms
 - BRI 2000..... 2-6
 - DAP MS20..... 5-6
 - DAP4000 4-3
 - ISX5010..... 3-5
- Autoloading
 - remote address of a DAP4000 4-9

B

- BRI 2000
 - adding units to database..... 2-3
 - clearing calls 2-20
 - configuring parameters 2-6
 - database configuration..... 2-1
 - defining Local Directory Number 2-15
 - defining password..... 2-14
 - displaying alarms 2-6
 - displaying unit information 2-5
 - front panel emulation..... 2-25
 - monitoring 2-18
 - placing calls 2-19
 - polling 2-6
 - storing CLI numbers 2-16
 - storing directory numbers..... 2-16
 - storing SPID 2-17
 - strap table..... 2-8
 - testing..... 2-20

C

- Canceling
 - ISX5010 tests in progress 3-19
 - local node loop tests 4-13
 - port tests in progress 3-20
- Channel Configuration screen.....2-2, 3-2, 5-2
- Channels
 - adding to database2-2, 3-2, 5-2
 - assigning to unit.....2-4, 3-4, 5-4
 - speed2-3, 3-3, 5-3
 - usage2-3, 3-3, 5-3
- Circuit
 - setup on trunk 3-9

Clearing

- BRI 2000 calls..... 2-20
 - DAP MS20 calls..... 5-10
 - DAP4000 calls 4-13
 - data tests errors on a data port 3-20
 - ISX5010 calls 3-18
 - ISX5010 tests 3-19
 - CLI numbers, BRI 2000 2-16
 - CMS Component Map
 - adding channels..... 2-2, 3-2, 5-2
 - adding COM port 2-2, 3-2, 5-2
 - adding EDMs 2-2, 3-2, 5-2
 - COM port
 - adding to database 2-2, 3-2, 5-2
 - Usage..... 2-2, 3-2, 5-2
 - Compare Straps menu..... 2-13
 - Comparing strap settings 2-13
 - Configure (*see also Strapping*)
 - BRI 2000 2-6
 - DAP MS20 5-7
 - DAP4000..... 4-5
 - ISX5010 3-7
 - tables 3-12
 - Copying profile
 - DAP4000..... 4-6
- ## D
- DAP MS20
 - adding units to database 5-3
 - alarms 5-6
 - clearing calls 5-10
 - configuring 5-7
 - control screen 5-5
 - database configuration 5-1
 - displaying unit information..... 5-5
 - event history 5-6
 - monitoring 5-10
 - phone numbers 5-8
 - placing calls 5-8
 - polling 5-6
 - testing 5-11
 - DAP4000
 - cancel test..... 4-13
 - copying from profile to profile 4-6
 - editing remote addresses 4-9
 - independent profile parameters..... 4-5
 - loading phone numbers 4-8

- local loopback test 4-13
- masking alarms 4-9
- node test 4-13
- return error test 4-13
- unit configuration by profile 4-5
- DAP4500
 - error test 4-13
 - remote loopback test 4-13
- Data port test errors
 - clearing 3-20
- Database configuration
 - adding channels 2-2, 3-2, 5-2
 - adding COM port 2-2, 3-2, 5-2
 - adding EDMs 2-2, 3-2, 5-2
 - adding units 2-3, 3-3, 5-3
- DCE+ device 5-5
- DDM 2-2, 3-2, 5-2
- Define Strap Table menu 2-8
- Deleting
 - statistics files 2-25
 - strap tables 2-10
- Diagnostics field 2-4, 3-3, 5-4
- Dialing
 - BRI 2000 2-19
 - DAP MS20 5-9
 - DAP4000 4-13
 - ISX5010 3-18
- Digital local loopback test
 - DAP4000 4-13
- Display
 - BRI 2000 unit information 2-5, 5-5
 - DAP MS20 unit information 5-5
 - DAP4000 information 4-2
 - ISX5010 card information 3-6
 - ISX5010 chassis information 3-4
 - ISX5010 version 3-5
- Downloading strap tables 2-11
- E**
- Editing
 - ISX5010 table definition 3-12
 - remote DAP4000 addresses 4-9
 - straps 2-7, 2-12
- EDM
 - adding to database 2-2, 3-2, 5-2
- Entire unit configuration
 - DAP4000 4-7
- Error test
 - DAP4500 4-13

- F**
- Features 1-1
- Front panel emulation 2-25
- G**
- General parameters
 - DAP4000 4-6
- H**
- History
 - DAP MS20 5-6
 - DAP4000 4-4
 - ISX5010 node 3-6
- I**
- Initiating backup calls
 - ISX5010 3-18
- Insert Unit screen 2-4, 3-3, 5-4
- ISX5010
 - chassis alarms 3-5
 - loading phone numbers 3-13
 - locking a port 3-11
 - mask phone numbers 3-13
 - receive data on a port test 3-20
 - receive data on a trunk 3-19
 - restoral 3-18
 - tests canceling 3-19
 - tests clearing 3-19
- ISX5010 port
 - local loopback test 3-20
 - remote loopback test 3-20
 - transmit data test 3-20
- ISX5010 trunk
 - remote loopback test 3-19
 - transmit data test 3-19
- ISX5010 version
 - display 3-5
- ISX5010/ISX5005 Upgrade 3-21
- ISX5314CS
 - Software Download Upgrade 3-22

- L**
- Line Quality Statistics
 - changing thresholds 2-24
 - displaying file contents 2-24
 - displaying retrieved statistics 2-23
 - storing in file 2-24

- Loading phone numbers
 - BRI 2000..... 2-16
 - DAP MS20..... 5-8
 - DAP4000 4-8
 - ISX5010..... 3-13
- Local Directory Number Configuration screen2-15
- Local loopback test
 - ISX5010 port 3-20
 - trunk..... 3-19
- Local node test
 - DAP4000 4-13
- Locking a port
 - ISX5010..... 3-11
- M**
- Maintain Disaster Table
 - ISX 5010..... 3-21
- Masking
 - ISX5010 phone numbers 3-13
- Modifying
 - internal log control 4-10
 - strap tables 2-9
- Module 1-1
- Monitor
 - BRI 2000..... 2-18
 - DAP MS20..... 5-10
 - DAP4000 4-10
 - description 3-14
 - ISX5010 data card signals 3-16
 - ISX5010 LBRV card signals 3-16
 - ISX5010 voice card signals 3-16
- N**
- Network Map
 - adding units..... 3-3
 - assigning strap table 2-11
 - reading straps.....2-7, 2-12
 - starting application2-3, 4-1, 5-3
- P**
- Polling
 - BRI 2000..... 2-6
 - DAP MS20..... 5-6
 - DAP4000 4-3
- Port
 - canceling tests..... 3-20
 - configure..... 3-9
- Printing
 - strap tables2-10
- R**
- Reading
 - ISX5010 into tables.....3-12
- Receive data test
 - ISX5010 port..... 3-20
 - ISX5010 trunk..... 3-19
- Remote loopback test
 - ISX5010 port..... 3-20
 - ISX5010 trunk..... 3-19
- Return error test
 - DAP4000..... 4-13
- S**
- Selecting
 - trunk3-14
- Serial ports
 - description.....4-1
- Setup
 - trunk circuit..... 3-9
- Signals
 - monitor BRI 20002-18
 - monitor DAP MS205-10
 - monitor ISX5010 data card3-16
 - monitor ISX5010 LBRV card3-16
 - monitor ISX5010 voice card3-16
- Software Download Upgrade
 - ISX5314CS3-22
- SPID.....2-17
- Strap tables
 - assigning.....2-11
 - comparing.....2-13
 - creating by reading straps2-7
 - creating manually2-8
 - deleting.....2-10
 - description.....2-6
 - displaying list2-9
 - downloading.....2-11
 - modifying2-9
 - printing2-10
- Strap Unit menu.....2-7
- Strapping
 - assigning strap tables2-11
 - comparing strap settings2-13
 - downloading strap tables.....2-11
 - editing straps 2-7, 2-11, 2-12

reading straps2-7
writing straps.....2-12

T

T7 Standard..... 2-4, 3-3, 5-4

Tests

BRI 20002-20
canceling3-19
canceling local node loop.....4-14
clearing.....3-19
DAP MS205-11
description..... 3-19, 4-13
local loopback on a trunk.....3-19
remote loopback on a DAP45004-13

Transmit data test

ISX50103-19
ISX5010 port.....3-20

Trunk

access.....3-14
monitor3-14
selection3-14

U

Upgrade

ISX5314CS Software Download Upgrade3-22

Usage field..... 2-2, 3-2, 5-2

Usage of Channel field 2-3, 3-3, 5-3

W

Writing straps2-12

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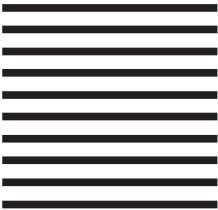
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