KENTROX

AI198
Common Logic Controller
System Manager/User's Guide

Version 2.2x

Part Number 198UM Rev 2

Kentrox, Inc.
5800 Innovation Dr.
Dublin, Ohio USA 43016-3271
Toll Free: (800) 247-9482
International: +1 (614) 798-2000
Fax: +1 (614) 798-1770

20010 NW Tanasbourne Dr.
Hillsboro, Oregon USA 97124-7104
Toll Free: (800) 733-5511
Direct: (503) 643-1681

About this Document

This document explains the use and operation of the AI198 common logic controller in an AIswitch Series 180.

The target audience for this document includes network, maintenance, and technical support personnel of the AI198. Users of this document are assumed to have working knowledge of:

- TCP/IP, X.25, and asynchronous data protocols
- PC or asynchronous terminal configuration
- Telco networks.

Document Conventions

Table 1 describes the text conventions used in this document.

Table 1 Document Conventions

Convention	Meaning
`Screen Text, Menu Items, System Prompts, Messages and Reports`	This style indicates configuration screen text, menu items, system prompts, messages, and reports.
`Commands`	Type text that appears in this style exactly as shown.
`Variable Command Text`	In a command statement, this style indicates text you specify.
`...`	In a command statement, ellipses (**`...`**) signify that the preceding parameter can be repeated a number of times.
`[ ]` **`[ | ]`**	In a command statement, square brackets indicate an optional parameter. Two or more parameters in square brackets with a vertical bar (|) between them indicate a choice of optional parameters.
`{ | }`	In a command statement, two or more parameters in braces with a vertical bar (|) between them indicate a choice of required parameters.
Menus and Menu Commands	This style indicates menu and menu commands. A vertical bar (|) separates the menus from the submenus or menu commands. The vertical bar also indicates the order in which you should click the menus, submenus, and menu commands.
Dialog Boxes, Tabs, Fields, Check Boxes, and Command Buttons	This style indicates dialog boxes, tabs, fields, check boxes, and command buttons.
Variable Field Text	This style indicates variable information you type in a dialog box field.
KEYS	Uppercase body text indicates keys on a keyboard, such as the TAB or ENTER keys. Keys used in combination are connected with a plus symbol (+).
Labels	This style designates physical components on Kentrox products such as jumper straps, switches, and cable connectors.

Table 1 Document Conventions (Continued)

Convention	Meaning
Note:	Note messages provide neutral or positive information that emphasizes or supplements important points of the main text.
Important:	Important messages provide information that is essential to the completion of a task.
Tip:	Tip messages provide information that helps users use equipment more effectively.
CAUTION:	Caution messages indicate that failure to take a specified action could result in loss of data and/or harm to the software or hardware.
WARNING:	Warning messages indicate that failure to take a specified action could result in physical harm to the user.
LASER DANGER:	Laser danger messages indicate that failure to take a specified action could result in eye damage or blindness to the user due to overexposure to invisible laser radiation.

Cautions and Warnings

Battery Warning

WARNING: Danger of explosion if battery is incorrectly replaced. Replace battery only with the same or equivalent type. Dispose of used batteries according to the manufacture's instructions.

Electrostatic Discharge Caution

CAUTION: AI equipment and its peripherals contain electrostatic sensitive components. Proper handling, shipping, and storage precautions must be exercised:

- You must remove and install cards in a static-free environment. Wear an antistatic wrist strap that is plugged into the AI equipment so you are grounded at the same point as the equipment.
- Do not remove cards from their antistatic plastic bags until you are ready to install them into the chassis.
- Immediately after you remove a card from the chassis, you must insert it into its antistatic bag.
- When the cards are not in use, keep them in their antistatic plastic bags.
- Do not ship or store cards near strong electrostatic, electromagnetic, or radioactive fields.

Ground Caution

CAUTION: For AI equipment to operate safely and correctly, there must be a safety ground strap between the equipment ground bolts and the office ground.

FCC Warning

The Federal Communications Commission has set limits for emitted radio interference, and AI198 is constructed with this electromagnetic interference (EMI) limitation in mind. AI198 is classified under FCC regulations as a Class A device, that is, a device for use in commercial environments and not in residential areas. This device has been tested and shown to comply with the following FCC rule: Part 15 Subpart J. Operation of this equipment in a residential area may cause interference to radio and TV reception, requiring the user to take whatever steps are necessary to correct the interference.

Information is available from the FCC describing possible corrective actions. To maintain low EMI levels, we suggest that you use only metal connectors and shielded cable grounded to the frame.

Specifications are subject to change without notice.

Customer Assistance

Kentrox offers technical support 24 hours a day, seven days a week.

Before you contact Kentrox for assistance, please have the following information available:

- The type of hardware and software you are using
- The error number and exact wording of any messages that appeared on your screen
- What happened and what you were doing when the problem occurred
- How you tried to solve the problem

Web Site Support

Support is available 24 hours a day using our Web site at:

http://www.kentrox.com

Email Support

Email support is available 24 hours a day. When you use email support, please be sure to include the details of your problem within the email.

To contact Technical Support, send email to:

techsupport@aiinet.com

Phone Support

Phone support is available. When you call Kentrox for support, please be sure you are at your computer and have the details of your problem available.

To contact Technical Support, call (866) 480-3571.

Kentrox Product Documentation

To order documentation, please contact your sales representative at (800) 247-9482 or +1 (614) 798-2000.

You can also access and view the most current versions of Kentrox product documentation on our Web site at:

http://www.kentrox.com

KENTROX

Table of Contents

AI198 Overview

This chapter provides an overview of the AI198 common logic controller (CLC).

In the AI180, the AI198 CLC is the only card explicitly required. At least one CLC is necessary to control the chassis. The CLC maintains contact with the smart line cards (SLCs) in the AI180, directing their interactions with each other and with any outside network components. It is also the central point for modifying and storing card configurations.

A backup CLC should be installed in the AI180 chassis. If the primary CLC fails, the backup will take over.

The AI198 can download software for itself and for other smart line cards. This includes Telnet, FTP, SNMP support, and many other features and commands that will be further discussed in this chapter.

Guide to this Chapter

Product Description

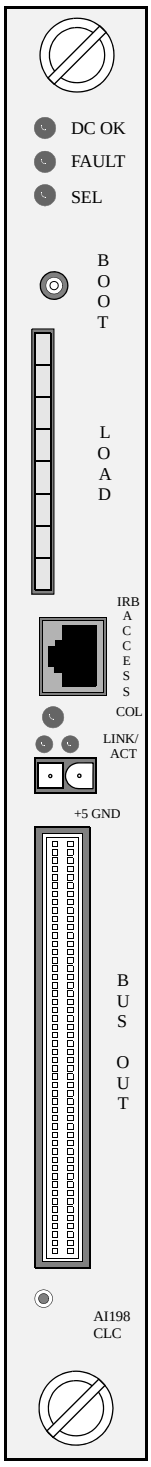

Figure 1-1
AI198

DC OK — On when +5 V is present.

FAULT — On if the card fails.

SEL — Identifies which CLC is active. In a system with redundant CLCs, only one should be on at any given time.

BOOT — Resets the entire AI180. The AI180 will restart using its saved configuration settings. Push this button after a fault has been corrected to switch back to the primary CLC.

LOAD — Indicates the status of system initialization, software downloading, and some system functions.

IRB ACCESS — 10BaseT IP access to the IRB bus.

COL — On when an Ethernet collision is detected.

LINK — Flashes when valid link integrity pulses are being received.

ACT — Flashes when Ethernet data is being transmitted by this CLC.

+5 GND — Used as a test point to adjust the AI1325-AC power supply.

BUS OUT — Used to connect an additional chassis where more interface cards can be housed.

Technical Specifications

Table 1-1 lists the specifications of the AI198.

Table 1-1 Technical Specifications

Specification	Description
Installation	Requires one slot in an AI chassis.
Power Consumption	16.5 W
Compliance	For use with AI UL listed AIswitch Series Chassis.

AI198 Functionality

Menu Driven Configuration

The AI198 offers a menu-driven configuration interface. Default settings streamline the initial configuration process and allow for quick reconfiguration.

The AI198 can be configured locally using a terminal at the craft port. You can also configure the AI198 through your network.

Dedicated Asynchronous Craft Port

The AI198 uses the dedicated craft port on the AI130 alarm panel or the AI180 (backplane Revision 6 or higher).

This provides a local access point to the AI180 for initial diagnostic messages and to affect system configuration and commands. The craft port may not be used to place calls.

Background Connections

Background connections provide remote access between a system manager on a network and the AI198. No asynchronous ports or special cables are required for remote AI login and CAAML applications (see Network Parameters on page 4-21). Most AI products have this feature. For information about individual card connections, see the specific smart line card document.

A background connection is the equivalent to connecting to the craft port. All the functions that can be performed at the craft port can be done with a background connection, with the exception CTRL+l (lowercase L) for toggling on-demand logging.

For additional information, refer to the **`break/b id`** and **`shobgc`** commands in Chapter 8: Commands from the AI Prompt, and the **`CAAML`** option in Chapter 4: System Configuration by Menu.

Activity/Alarm Log

The system can send information about system activity and alarm indications to a system port. The data from this port can be used for system maintenance, configuration balancing, and security and accounting systems information.

Backplane Alarms

Alarms are generated across the backplane and can be viewed on the craft port or on any programmed port.

Call Routing

The AI180 can act as a gateway by making connections from one Smart Line Card to another. The system automatically looks up an incoming call destination and routes the call to the preconfigured destination in another network. Call routing is supported by an alias macro language, multiplexed and aggregated TDSs, alternate routing, and computed call parameters.

Autoswitching to Backup CLC

With redundant CLCs, the system can automatically transfer processing from the active CLC to the backup CLC when necessary. For this feature to work, the CLC selector switch on the noncabled side of the controlling chassis must be set to AUTO.

The swcpu command can force switching from the active CLC to the backup CLC.

Automatic CLC Update

Using menu item 1.11, the system can be set up to automatically configure a secondary CLC when placed into an AI180 with an active CLC. These conditions are required:

- The AI180 power must be on
- Only one operating CLC is mounted in the AI180
- The CLC selector switch must be set to AUTO
- Menu item 1.11 of the operating CLC must be set to on
- Both CLCs must have the same software version.

When the secondary CLC is inserted into the AI180, the configuration of the active CLC will then be copied to the secondary CLC. During the update process, the **LOAD** LEDs on the faceplate of the secondary CLC displays an active pattern.

Also, if any changes are made in the active CLC configuration, these changes will automatically be made in the backup CLC configuration.

EIA Modem Simulation for Connection

The system can program the disconnected and connected states of Electronic Industries Association (EIA) signals. The system can also be programmed to toggle these leads. The system can use EIA signaling to simulate modem style access to host computers. These signaling options provide a secure and flexible connection to any asynchronous host and modem port.

Network Management Features

In addition to menu and command-driven configurations, advanced configuration and network management can be performed over the network.

Telnet Connections

You can use a Telnet connection to access the AI180 over a Local Area Network (LAN) or Wide Area Network (WAN). This is essentially a remote version of the craft port where you can input system configurations and commands but cannot place calls.

Telnet sessions are faster than asynchronous connections and are better at handling lengthy reports (such as DMPCFG output). Logging can be accomplished on any Telnet session without any special configuration. Press CTRL+l (lowercase L) to toggle logging on or off for the connection.

The Telnet session cannot be used to perform asynchronous file transfers for software or configuration downloads or uploads.

FTP Connectivity

You can use File Transfer Protocol (FTP) to download or upload software or configuration files to or from the AI198.

The AI198 FTP server conforms to the standards for FTP, and you should have FTP client software on your networking computer. Note that some client packages do not conform to all FTP standards and may not work properly with this system. If your FTP client does not function as expected, contact Technical Support for suggestions.

Supported FTP Commands

Table 1-2 is a list of FTP commands supported on the AI198. The commands are issued transparently between the CLC and the client application and may not be directly available.

Table 1-2 Supported FTP Commands

Command	Description
dele	Allows you to delete a file. Currently, only the image as.img can be deleted.
help	Provides help information.
list	Provides a directory listing of valid files on the CLC. Arguments will be ignored.
mode	Stream is the only implemented transfer mode. Other modes are not implemented.

Table 1-2 Supported FTP Commands (Continued)

Command	Description
nlist	See **list**.
noop	Indicates no operation. The CLC returns an OK as a response to this command.
pass	Allows you to specify the user password.
port	Allows you to specify the data connection port.
pwd	Allows you to print the current working directory. Since the only directory available on the AI198 is the root directory, "/" is sent as the response.
quit	The CLC terminates the FTP session and closes the connection.
retr	Allows you to retrieve a file. The CLC transfers a copy of the specified file to the user site. The file on the CLC is unaffected.
stor	Allows you to store a file. The CLC accepts data from the user site. This data is stored on the CLC in the specified file. If the file already exists, its contents will be replaced by the transferred data.
stru	File is the only implemented structure. Other modes are not implemented.
type	Allows you to specify a data transfer type. These transfer combinations are recognized: • **an** ASCII, nonprint • **in** Image, nonprint • **l8** Byte size can only be 8 All binary image files must be transferred in image (or binary) mode.
user	Allows you to specify a user name.
xpwd	Allows you to print the working directory. See **pwd**.

SNMP Manageability

Simple Network Management Protocol (SNMP) is an industry standard protocol for managing network elements. The SNMP agent on the AI198 allows management and monitoring of the AI180 using a network manager such as AppliedView.

AppliedView features a Graphical User Interface (GUI) that you can use to configure and manage an entire network of AI products, from card level to link level.

Alarm monitoring is also supported via SNMP and AppliedView. Many configurable options on both the AI198 and AppliedView allow the alarm reporting mechanism to be configured to the needs of the network manager.

Automatic Reboot

The AI198 now offers an automatic reboot feature after a system crash. This feature is enabled only when no backup CLC exists.

AI2524 Configuration

When using secondary addressing on the Ethernet0 interface, the primary address must be in the same network as the TFTP server. An example of secondary addressing would be configuring the Ethernet0 interface for two networks (that is, 198.x.x.x and 192.x.x.x). The configuration for the Ethernet0 interface would look similar to this:

```
Interface Ethernet0
ip address 198.30.36.1.255.255.255.0
ip address 192.30.36.1.255.255.255.0 secondary
```

In this example, the primary network is 198.30.36.1, and the secondary network is 192.30.36.1. You would have to configure the AI198 with an IP address in the 198.30.36 network to serve as the TFTP server for the AI2524.

Note: The AI198 supports TFTP configuration files up to 25K.

Firmware Upload/Download to CLC

You can update the internal software of the AI198 through downloads. Updates, corrections, and enhancements can be delivered as software. In most cases, you can install this software using a few keyboard commands.

Depending on your connectivity, you can load files from a floppy diskette on a personal computer or your local network. This can be accomplished using an asynchronous connection or using the AI198 built-in FTP capability.

Firmware Download to Smart Line Cards

Using the AI198, you can also download software to Smart Line Cards. You can obtain software image updates from an external source such as a floppy disk or computer network.

Configuration Upload/Download

The configuration upload/download feature lets you store and reload configuration information via floppy disk or network, and transfer configurations between separate networks. The AI180 can also back up and restore configurations for remote AI180s.

Hot-Swap

Hot-swap is supported on the AI198 and on all Smart Line Cards in the AI180. By completing the proper procedures, an inactive card may be pulled from the chassis and replaced without having to power down the AI180.

Commands used in these procedures are described in detail in Chapter 8: Commands from the AI Prompt.

AI2524 and AI294 Configuration Storage and Hot-Swap

The AI2524 and AI294 must have their configuration stored on the AI198 to insure the ability to perform the hot-swap. When the AI2524 and AI294 boot, they use the BOOTP protocol to obtain their IP addresses. The AI2524 and AI294 then use TFTP to transfer their configuration information from the AI198 to the AI2524 and AI294. Any changes made to the AI2524 or AI294 configuration must be stored back to the AI198 to maintain full hot- swap capability. The following sections detail some options for managing the AI2524 and AI294 configurations.

Always Modify the Configuration Using Menu 4.18

This option suggests that you use Menu 4.18 whenever you make modifications to either the AI2524 or AI294 configuration. After you complete the modifications, you can use the **`enabl`** command to reset the AI2524 and AI294. This allows the changes to take effect.

Modify the Configuration on the AI2524/Store the Configuration on the AI198

This option suggests that whenever you make modifications to the AI2524 configuration using the configuration mechanism (Telnet to the card and change the configuration or access the console port), you must store the modifications on the AI198. You can save the configuration to the AI198 using TFTP on the AI2524.

Modify the Configuration on the AI294/Store the Configuration on the AI198

This option suggests that whenever you make modifications to the AI294 configuration using the AI294 configuration mechanism (Telnet to the card and change the configuration or access the console port), you must store the modifications on the AI198. You can save the configuration to the AI198 using TFTP on the AI294.

1. After logging into the AI294 using Telnet or the console port, make the desired configuration changes.
2. Disable BOOTP in the AI294 configuration.
3. Perform a warm or cold reset.

4. Log onto the AI294 using Telnet or the console port.
5. Re-enable BOOTP.
6. Use the **par-upld** command to transfer the configuration to the AI198.

CLC Procedure

This procedure is for hot-swapping the CLC only. Do not perform this on smart line cards.

CAUTION: Never remove the active CLC when its green **SEL** LED is on.

1. Determine which CLC is inactive. On an inactive CLC, the **SEL** LED is off.
2. Loosen the two locking screws holding the inactive CLC in place.
3. Firmly grasp the locking screws of the inactive CLC and pull the card out of the AI180 chassis.
4. Insert the new CLC into the same slot in the AI180 chassis. Press it firmly into place and tighten the two locking screws.
5. Reconnect all cables and connectors which were disconnected in step 2.
6. Enter the **cpycnf** command at the AI command prompt to copy the configuration from the active CLC to newly connected backup CLC.
7. Be sure that the newly connected backup CLC is using the latest software. For more information, see Chapter 6: Downloading Software and Configurations.

Smart Line Card Procedure

This procedure is for hot-swapping smart line cards only. Do not use this procedure on your CLC. Note that the AI2524 and AI294 are unlike any other card in that you do not have to manage the ports. Typically, you need to disable cards by using the **stpslc** and **disabl/c** commands before you can remove them from the switch. The AI2524 and AI294 do not require you to use these commands.

1. Log on to the AI180.
2. Enter this command at the AI command prompt to stop the smart line card:

   stpslc *baseport*

   baseport is the baseport of the target smart line card.

3. Type **y** for confirmation.

Note: Do not use the **stpslc** command for the AI2524 or AI294. If you type the **stpslc** command for either card, the system displays one of these messages:

```
>stpslc 00
   Cards/ports will be restarted as follows:
Baseport  Type    Status   Description
000*      AI2524  ENABLED
Ports/Cards marked with * are unaffected by this command.
```

4. Enter this command at the command prompt to disable the smart line card:

disabl/c *baseport*

baseport is the baseport of the target smart line card.

Note: Do not use the **disabl/c** command for the AI2524 or AI294. If you type the **disabl/c** command for either card, the system displays one of these messages:

```
>disabl/c 00
Cards/ports will be restarted as follows:
Baseport  Type    Status   Description
000*      AI2524  ENABLED
Ports/Cards marked with * are unaffected by this command.
```

5. Disconnect any cables and connectors attached at the smart line card's faceplate. If necessary, mark the position of each cable so that they can be reconnected to the same port or connector without doubt.
6. Loosen the two locking screws holding the smart line card in place.
7. Firmly grasp the locking screws of the smart line card and pull the card out of the AI180 chassis.
8. Insert the new smart line card into the same slot in the AI180 chassis. Press it firmly into place and tighten the two locking screws.
9. Reconnect all cables and connectors which were disconnected in step 2.

10. Enter this command at the command prompt to restart the smart line card:

    enabl/c *baseport*

    baseport is the baseport of the target smart line card.

    Note: For the AI2524 or AI294, when you type the **enabl/c** command, the system displays this message:

```
>enabl/c 00
Cards/ports will be restarted as follows:
Baseport  Type    Status   Description
000       AI2524  ENABLED
Are you sure you want to proceed? (Y/N) >
```

11. Type **Y** for confirmation.

Quick-Start Configuration

This chapter describes the quick-start method for starting and testing the AI180.

Quick-start is a method for putting the AI180 into operation quickly. To perform a quick start, we assume that you are starting with the default system parameters that were set at the factory. Reinitializing to the default configuration is described in this chapter.

To use the quick-start method, you must first use the menu system to set up the desired destinations and configure the ports that access those destinations.

Guide to this Chapter

Requirements

Before you begin:

- Be familiar with navigating within the menus. See Navigating Menus on page 4-3 for instructions.
- Be aware that quick-start does not take full advantage of the AI180 capabilities.
- Set up your AI180 according to the *AIswitch Hardware Manual*.

Connecting to the Craft Port

When you receive your AI180 system, it has a simple initial configuration. This default sets all ports to 9600 baud, 8 data bits, no parity, and 1 stop bit.

Under the default setup, logging (displaying log messages) is enabled on the craft port. Note that this can be altered when you customize your configuration, sending the log to another port that uses a different communication protocol. Quick-start assumes, however, that you are viewing log output from the craft port.

If you are using a dumb Cathode Ray Tube (CRT) terminal, you only need to have pins 2 (to transmit data), 3 (to receive data), and 7 (signal ground) connected. If your cable does not work, the most probable cause is that the signals on pins 2 and 3 need to be reversed. Try correcting this first. If you need additional information on terminal wiring, see the *AIswitch Hardware Manual.*

Set the terminal speed to 9600 baud, 8 data bits, no parity, and 1 stop bit. See your terminal operator manual for instructions on how to set these options. If you are using a personal computer, you must have a terminal emulation program.

CLC Initialization

Setting for Redundant CLCs

The AI180 has the capability for redundant controller logic. The **CLC** selector switch on the noncabled side of the chassis should be in the **AUTO** position to allow the system to automatically switch to the backup CLC if necessary.

For systems not equipped with the a redundant CLC, the **CLC** selector switch should be in the **A** or **AUTO** positions.

Only the panel switch on the controller chassis is used by the system; the panel switches on expander chassis have no effect.

Power-Up Sequence for Expander Chassis

When powering up an AI180 with one or more expander chassis, make sure to turn on all the expander chassis before turning on the controller chassis containing the CLC card.

If the controller chassis comes up before the expander chassis, the ports in the expander chassis may not be seen by the startup diagnostics and will not be available for use. If this happens, push the **BOOT** button on the CLC in the controller chassis and the system restarts properly.

System Reset Message

System reset occurs when power is initially applied to the unit or when the **BOOT** button on the CLC is pressed. This message appears:

```
** AIswitch Reset—Running Diagnostics **
```

The message is sent to the craft port at 9600 baud, 8 data bits, no parity, and 1 stop bit. This message prints on the craft port regardless of where the log port has been programmed.

This message prints to provide some reliable way of telling that the system has been restarted. Should the system fail any of the critical diagnostics, further system fault information prints on the craft port. For this reason, a terminal or printer should always be connected to the craft port, even if logging and configuration is normally performed on a different port.

If the reset message does not appear, refer to the *AIswitch Hardware Manual* for setup and wiring procedures.

CLC Initialization Sequence

Upon power up or reset, the CLC performs a sequence of diagnostic functions. The results are displayed as each step is completed.

The remaining messages are directed to the log and/or craft port as configured in Menu 1.1. If no log port is configured, these messages are sent to the craft port regardless of its setting.

A example initialization report follows. In a fully operational system, this would be followed by initialization messages from the various smart line cards and configured links.

Example Initialization Report

The following is an example of an initialization report.

```
**AIswitch Reset - Running Diagnostics**
EEPROM checksum=7EB08D3D
**** (0)  Initializing TOD clock...
**** (1)  Reading TOD clock...
**** (2)  Testing configuration version...
**** (3)  Initializing log port...
**** (4)  Testing line cards...
Card at base port 0 is functional
Card at base port 16 is functional
Card at base port 32 is functional
Card at base port 48 is functional
Card at base port 64 is functional
Card at base port 80 is functional
Card at base port 96 is functional
Card at base port 112 is functional
Card at base port 128 is non-functional
Card at base port 144 is non-functional
Card at base port 160 is non-functional
Card at base port 176 is non-functional
Card at base port 192 is non-functional
Card at base port 208 is non-functional
Card at base port 224 is non-functional
Card at base port 240 is non-functional
**** (5)  Initializing alarm system...
**** (6)  Logging system information...
@NODE-XXX 15:42:43 020596 Sev=F Base=Active CLC Msg:
*******AIswitch Restarted*******
@NODE-XXX 15:42:43 020596 Sev=F Base=Active CLC Msg:
Version 98CLC130.000053 (02/01/96 16:10:38) /DEB/180/DUAL/WTX
@NODE-XXX 15:42:43 020596 Sev=F Base=Active CLC Msg:
EEPROM checksum=7EB08D3D
@NODE-XXX 15:42:43 020596 Sev=F Base=Active CLC Msg:
Total number of online ports 068
@NODE-XXX 15:42:43 020596 Sev=F Base=Active CLC Msg:
This cpu is the A Processor, Switch is in AUTOMATIC
**** (7)  Testing reconfiguration strings...
**** (8)  Executing initialization strings...

**** (9)  Begin normal operation...

*CONNECTING NOW*
```

Basic Configuration

Logging in to AI

The craft port is automatically attached to the system manager's account (destination AI). If no password has been configured for this destination, the AI180 presents the user with a command prompt.

If a password has been set (see menu item 2.13), you must type this password at the craft port before access is allowed.

Reinitializing Configuration to Factory Defaults

You may want to reinitialize the EEPROM configuration database back to factory defaults. You can then reconfigure the system using this as your base.

Before clearing the configuration database, it is highly recommended that you first obtain listings of your current configuration parameters. A variety of commands are available for this purpose (see Chapter 8: Commands from the AI Prompt). For example, a hardcopy of the DMPCFG, STASLC, and SHOPRT 0-255 reports could be invaluable. Also, having an electronic copy of the Active.ee file (via FTP) or the DMPEE or DMPCFG reports make editing and restoring the reconfiguration much easier.

Once you have obtained your reports, enter **`selcnf/c`** to initialize the configuration.

After you enter this command, this message appears on your screen:

```
Are you sure you want to proceed? (y/n)
```

CAUTION: The **`selcnf`** command reinitializes the system configuration. Any previous configuration will be lost. The AI180 configuration will have to be reentered from scratch or restored from backup.

After you enter this command, the AI180 automatically resets, and the current configuration is deleted in favor of the factory defaults.

Alternately, you may send a CTRL+r from the craft port during the central AI180 initialization sequence any time before the message is printed.

Also note that commands entered in Menu 1.9.2 will be executed after this reinitialization. If you wish to prevent this, you must send an ESC from the craft port during the central AI180 initialization sequence.

Introduction to System Configuration

This chapter describes different methods for logging in and setting up the system, and it defines important user concepts.

The AI180 must be properly configured so that its components work together for your specific network needs.To this end, AI provides a number of connection and configuration methods. You can use any of the methods explained in this chapter to change the system configuration.

All configuration data is stored in a nonvolatile EEPROM memory, so it will not be erased if power is interrupted.

The AI180 is shipped from the factory supplied with a default configuration for all the ports and destination names. These default values appear on the initial menus and on the system configuration worksheets. To configure the system using default values, see Chapter 2: Quick-Start Configuration.

Guide to this Chapter

Terms

Ports, Links, Spans and TDSs

In the current documentation, the terms port and link refer to a single connection. A TDS is one of the 256 data channels within the AI180.

Before the introduction of smart line cards, a connection always required two ports and two TDSs. Because of this, most older literature and the menu system treat the terms port and TDS as though they were identical.

In general, if a smart line card is being discussed, the term port means TDS unless the context makes it clear that a physical connection is being referenced. Link and span always refer to a single physical connection on a smart line card.

Destinations

A destination (also referred to as a class or class of service) is a named group of attributes which may be applied to any number of TDSs. The destination name is used for both the simplest forms of call routing and as the basis upon which sophisticated call routing is built.

Aliases

Aliases are used for most call routing. They are required for all calls being routed from one smart line card to another. For other calls, they provide a variety of necessary features such as automatic call parameter generation.

Alias call processing is done in three stages. First, when a call is received from a smart line card or user port, call routing strings attempt to match the call to an alias name. Then the alias macro language is used to evaluate the incoming call parameters and produce output parameters. Finally, the output parameters either complete the call within the AI180 or continue the routing by placing an outgoing call.

Another feature of aliases is alternate routing. This allows the AI180 to reroute failed calls along different paths, adding robust fault tolerance.

For more information, see these chapters:

- Chapter 7: Call Routing
- Appendix C: Reading Alias Macros

Configuration Methods

An extensive software system provides the system manager with maximum flexibility in configuring the system. A wide variety of connections can be used for configuration. The methods below are listed from the most fundamental to the more sophisticated and automated:

- Menu System
- config Command
- Configuration Via SNMP Manager
- Configuration Upload/Download

Menu System

The AI180 offers a menu-driven configuration system, with default settings throughout which allow you to streamline the initial configuration.

The AI180 can be configured locally using such tools as a terminal on the craft port. Access to configuration menus and commands can also be accomplished by logging in through your network. Methods of connection are discussed below.

config Command

The **`config`** command is very closely related to the menu system. It allows you to make the same kind of changes to the AI180 configuration without actually entering the menu system. It is not recommended for inexperienced AI198 users.

Enter the **`config`** command from the command prompt after connecting to the AI180. You can type the **`config`** command followed by a series of menu, menu item, and value arguments (keywords). These keywords identify the equivalent menu and menu item you wish to configure and the value you wish to select.

For a detailed explanation of this command and keyword listing, see Appendix B: The config Command.

Configuration Via SNMP Manager

SNMP is an industry standard protocol for managing network elements. The SNMP agent on the AI198 allows configuration of the AI180 using a network manager such as AppliedView.

AppliedView features a graphical user interface, allowing you to perform network configuration, management, and monitoring.

For more information on using SNMP, see Chapter 5: Configuration by SNMP. Additional information can also be found in the *AppliedView AI Product Element Management System Installation and Administration* document.

Configuration Upload/Download

The configuration upload/download feature lets you work with the whole configuration. You can store and reload configuration information via floppy disk or network or even to transfer this information between separate networks.

This also provides the ability to both back up and restore configurations for remote AI180s. This feature is covered in Chapter 6: Downloading Software and Configurations.

Data Entry Menu Items

Strings

ASCII strings are used in many menu items. They may contain the characters zero through nine, A through Z, and any punctuation mark except the plus sign (+), asterisk (*), and comma (,). In most menu items, both string and extended string inputs are converted to uppercase. However, there are cases where the entered case is preserved.

Extended Strings

In addition to the printable ASCII characters, extended strings can contain all other characters with values from 1 to 254. Character values 0 and 255 are reserved internally as delimiters. While some nonprintable characters may be typed directly from a terminal, the preferred method of entry is indicated in the following sections.

Angle brackets are required for each included control character. Because the < character is used in this special manner, it cannot be used normally in a string, such as to indicate less than. This is especially important to remember when entering alias macro strings. To include a less than character in a string, type **<<**. This will be reduced to a single **<** when the string is evaluated.

To terminate an extended string, place a null character <0> after it. For more information on character codes, refer to Appendix A: ASCII Codes.

Format

value

Parameters

value	This argument is a decimal number from 1 to 254.

Decimal Numbers

These menu items allow the entry of the characters zero to nine. Frequently, there are limitations on both the minimum and maximum values which may be entered.

Hexadecimal Numbers

These menu items contain base 16 numbers. In addition to the characters zero to nine, characters A to F represent the numbers 10 to 15. They are frequently used as a more compact representation of a binary (base 2) number.

Internet Addresses

Internet addresses consist of four decimal numbers separated by periods (for example: 89.2.3.10). In general, each of the numbers can range from 0 to 255.

Accessing the AI180

The AI180 may be accessed in any of these ways:

- Access Via the Craft Port
- Access Through Background Connections
- Access Via Telnet

Access Via the Craft Port

There is a dedicated craft port on the AI130 alarm panel and the AI180 chassis (backplane Revision 6 or higher). A terminal properly connected to this physical port provides communication with the CLC for system configuration, monitoring, and logging output.

The craft port cannot be used to place calls through the system to other ports.

Connection

A dumb terminal or any computer running terminal emulation software can be connected to the physical craft port.

Communications with the craft port must be set to 8 bits per character, no parity, and 1 stop bit. The craft port also responds to XON/XOFF flow control.

During normal operation, the craft port appears to be port 256 on the system. The screen prompt will refer to it as craft port.

Logging In

The craft port is automatically attached to the system manager's account (destination AI). If no password has been configured for this destination, the craft port will automatically be logged into the AI180 and will present you with a command prompt.

If a password has been set (see menu item 2.13), you will be prompted to enter this password at the craft port before you are given access.

Logging Out

Where a password has been configured for the AI destination, the system manager should log out after completing work on the craft port. From the command prompt, type one of these commands: **`bye`**, **`lo`**, **`logoff`**, or **`logout`**.

The Error/Activity Log

The craft port may receive the error log in parallel with the log port set in menu item 1.1.2. It will also receive log information when the log port is disabled. The craft port logging state is initially set in menu item 1.1.9. It may be toggled on or off by pressing CTRL+l (lowercase L) at the terminal.

Craft Port Character Usage

Communications with the craft port are 8 bit, no parity, 1 stop bit. When characters are received, the high bit is cleared. These are legal entries. All others echo a CTRL+g (bell).

Table 3-1 Legal Entries for Craft Ports

Entry	Description
<Break>	Use this entry to terminate a connection. Discard all input/output.
XOFF	Use this entry to stop sending characters.
XON	Use this entry to start sending characters.
CTRL+l (lowercase L)	Use this entry to toggle the logging state. The initial logging state is set in menu item 1.1.9.
CTRL+o	Use this entry to flush the output buffer.
BACKSPACE or DELETE	Use these entries to remove the previous character from the input buffer. It echoes BACKSPACE-SPACE-BACKSPACE to clear the character.
CTRL+u	Use this entry to remove all previous characters from the line. Echoes BACKSPACE-SPACE-BACKSPACE multiple times.
RETURN or <Linefeed>	Use these entries to signal the end of the line, to cause a carriage return and line feed combination to be echoed, and to cause the input to be evaluated.
SPACE or <Tilde>	Use these entries to add a character to the line buffer.

Access Through Background Connections

Background connections provide remote access to the AI198 from a network. No asynchronous ports or special cables are required for remote AI login and CAAML applications. Most AI products can use this feature. See your specific smart line card document for compatibility and details.

A background connection is the remote equivalent of connecting to the craft port. All the functions that can be performed at the craft port can be done with a background connection with the exception of CTRL+l (lowercase L) for toggling on-demand the ability to log on and off.

Connecting

To use background connections, your terminal must have an access path to a smart line card capable of communicating on the AI180 backplane. See your specific smart line card document for backplane compatibility, as well as for installation and configuration instructions.

Next, you must establish an alias which directs the connection to the AI destination on the AI198. This can be done from the menu system. Refer to Chapter 7: Call Routing.

To create an alias:

1. Specify the incoming called address. This can be done in menu item 8.1.
2. Select simple alias translation as the translation type in menu item 8.2.1.
3. Specify the destination in menu item 8.3:

   Here is an X.25 example:

```
                                                                Menu 8

01 Alias name -  1001001000
02+Simple alias translation
03 Destination - AI
```

In this example, any incoming call with a called address of 1001001000 would be directed to the AI destination, establishing a background connection.

Logging In

Once the connection is established, you will be logged into destination AI. If your login requires, you may be prompted to enter a password before you can gain access.

Once logged in, you can perform configuration and command functions.

Logging Out

The normal CLC disconnection commands (**`bye`**, **`lo`**, **`logoff`** and **`logout`**) will terminate the background session.

Error/Activity Log

This function is not normally available from a background connection.

Character Usage

The editing features are the same as those found on the craft port.

Checking Status

The status of all background connections can be obtained through the command shobgc on page 8-95.

Removing Sessions

Enter the **break/b** *bid* command to remove a background connection. *bid* is the background connection number.

Access Via Telnet

Telnet provides access to the AI180 over a LAN or WAN. This is essentially a remote version of the craft port which enables you to affect system configuration and commands. Telnet, however, is much faster than asynchronous connections and is better at handling lengthy reports (such as DMPCNF output).

The Telnet session cannot be used to perform asynchronous file transfers for software or configuration downloads or uploads.

Connecting

The AI198 can be accessed in the same manner as any other Telnet capable device. Using Telnet software on a computer that resides on the same TCP/IP network as your AI180, you establish the session by connecting to the AI198 IP address. See the instructions from your specific Telnet package for details.

Enter the AI198 IP address in the Network Parameters on page 4-21 of Chapter 4: System Configuration by Menu. If you do not know the IP address of the AI198, log in using other means and consult the menu to obtain the current address information.

Logging In

Once the connection is established, the `Enter destination name` prompt appears. You must enter a valid destination.

If your login requires a password, the password prompt appears. Note that this is not the destination password but the shell-override password as entered in menu item 2.14 during system configuration.

Only three incorrect login attempts are allowed before the connection is broken. Both incorrect and correct login attempts are logged.

Once logged in, you may perform configuration and command functions.

Logging Out

These commands will terminate the Telnet session: **bye**, **lo**, **logoff**, and **logout**.

Error/Activity Log

Logging can be done without any special configuration. Press CTRL+l (lowercase L) to toggle between logging on or off for the connection.

Character Usage

The editing features are the same as those found on the craft port.

Timers

Certain Telnet functions have associated activity timers. The session will be disconnected if an activity timer expires.

The initial activity timer is 30 seconds for these states:

- Login
- Waiting_for_password
- Password

The activity timer for the connected state is 4 hours if logging is not turned on and unlimited if logging is enabled.

Checking Status

The status of all Telnet connections can be obtained through the command shell on page 8-94. Shell connection numbers will appear with the newest connections at the top of the list.

The shell ID number will roll over at 2^32.

Removing Sessions

Type the **`break/s`** *`sid`* command to remove a Telnet connection. *`sid`* is the shell connection number.

Delay of Output

Some commands can cause the Telnet session to appear inactive for an extended period. Command processing takes place as input is parsed, but output is not handled until later. This can be particularly noticeable when creating or restoring a DMPCFG report.

Account Profiles and User Account Security

The AI198 allows you to configure or modify account profiles, account security profiles, and account passwords, and determine other logins to the AI180. Add account profiles to the account profile database as needed after configuration.

Note: The AI198 can access up to 120 account profiles.

Permission Profiles and Default Commands

The AI198 allows user-defined security profiles. Each security profile configures specific commands allowed to be executed with that profile. When user accounts are configured, each user must be assigned a security profile, thereby defining the specific AI198 commands a particular user may use. The account supervisor can create, delete, edit, and list the permission profiles.

Users may be added with any permission profile which governs the commands they are allowed to execute. These tables list the default commands that can be executed by each of the four default permission profiles provided by AI.

Table 3-2 lists the default commands that can be executed with the STATUS permission profile.

Table 3-2 Commands for STATUS Profile

active	alrsho	bye	clist	dhold
dmpee	help	inv	ioact	lists
lo	logoff	logout	lstdsb	menuro
netsta	password	plist	repeat	shell
shobgc	shocls	sholog	shoprt	slist
stacls	staeia	staprt	staslc	stat
states	status	tftpstat	tmract	*tnlogin
watcpu				

Note: Note that the asterisk (*) located before some of these commands denotes that they are functions and not commands. These functions can be either enabled or disabled for a particular account. For example, you may want to set up an account that does not allow logins via Telnet or FTP. In this case, you would remove the Telnet and FTP commands for the particular account profile being configured. Any user assigned to use the particular account profile would not have the ability to log in via Telnet or FTP.

Table 3-3 lists the default commands that can be executed with the MGMT permission profile.

Table 3-3 Commands for MGMT Profile

active	alrclr	alrset	alrsho	blast
bnc	break	bye	cfgmsg	clcip
clist	clr	clrals	clsoff	clson
commstr	config	cpycnf	cpycrd	debug
dep	dhold	disabl	dmpcfg	dmpee
dmpslc	dump	dwnld	eb	eed
eesize	enabl	ex	fast	flush
*ftplogin	help	inv	ioact	leds
lists	lo	lock	loglvl	logoff
logout	loop	lstdbs	mcon	menu
menuro	netclr	netsta	password	pick
plist	prtdsc	pstat	repeat	reset
restee	selcnf	send	shell	shobgc
shocls	sholog	shoprt	*slclogin	slist
stacls	staeia	staprt	staslc	stat
states	status	stpslc	swcpu	telnet
test	tftpstat	time	tmract	*tnlogin
tstini	unlock	update	watcpu	winslc
wndrct				

Note: Note that the asterisk (*) located before some of these commands denotes that they are functions and not commands. These functions can be either enabled or disabled for a particular account. For example, you may want to set up an account that does not allow logins via Telnet or FTP. In this case, you would remove the Telnet and FTP commands for the particular account profile being configured. Any user assigned to use the particular account profile would not have the ability to log in via Telnet or FTP.

Table 3-4 lists the default commands that can be executed with the SUPERVISOR permission profile.

Table 3-4 Commands of SUPERVISOR Profile

account	accountp	active	alrclr	alrset
alrsho	blast	bnc	break	bye
cfgmsg	clcip	clist	clr	clrals
clsoff	clson	commstr	config	cpycnf
cpycrd	debug	dep	dhold	disabl
dmpcfg	dmpee	dmpslc	dump	dwnld
eb	eed	eesize	enabl	ex
fast	flush	*ftplogin	help	inv
ioact	leds	lists	lo	lock
loglvl	logoff	logout	loop	lstdbs
mcon	menu	menuro	netclr	netsta
password	pick	plist	prtdsc	pstat
repeat	reset	restee	selcnf	send
shell	shobgc	shocls	sholog	shoprt
*slclogin	slist	stacls	staeia	staprt
staslc	staslc	states	status	stpslc
swcpu	telnet	test	tftpstat	time
tmract	*tnlogin	tstini	unlock	update
watcpu	who	winslc	wndrct	

Note: Note that the asterisk (*) located before some of these commands denotes that they are functions and not commands. These functions can be either enabled or disabled for a particular account. For example, you may want to set up an account that does not allow logins via Telnet or FTP. In this case, you would remove the Telnet and FTP commands for the particular account profile being configured. Any user assigned to use the particular account profile would not have the ability to log in via Telnet or FTP.

Table 3-5 lists the default commands that can be executed with the FTP permission profile.

Table 3-5 Commands for FTP Profile

bye	***ftplogin**	**lo**	**logoff**	**logout**

Note: Note that the asterisk (*) located before some of these commands denotes that they are functions and not commands. These functions can be either enabled or disabled for a particular account.

Table 3-6 contains a list of password requirements and a description for each.

Table 3-6 Password Requirements Descriptions

Password Requirement	Description
240	Maximum number of characters for passwords
1	Minimum number of characters for passwords
Any printable character	Accepted characters for passwords
Not case sensitive	Case sensitivity

Setting Up User Accounts

These procedures outline how to set up a user account.

1. Use the accountp/a command sequence to create a permission profile that will contain the commands to be used by a particular user.

   This step is optional if a permission profile already exists and contains the commands to be used by the specified user.

2. Use the account/a command sequence to add a new user account.

3. Log on to the AI180.

   You will have access to the commands specified in your assigned permission profile.

Refer to sections Managing User Accounts and Managing Permission Profiles of this chapter, and Chapter 8: Commands from the AI Prompt for more detailed information.

Managing User Accounts

These procedures detail an example of the commands you might use to manage a user account.

1. Use the **account/a** command sequence to add a new user account. Enter the following.

   account/a *username pswd permprofname*

   username is the username of the account you want to add. *pswd* is the password of the user. *permprofname* is the name of the permission profile to use. A screen similar to this appears:

```
>account/a adam adam profile1
ACCOUNT/A usrname pswd perm - to add account
ACCOUNT/D usrname - to delete account
ACCOUNT/L - to list accounts

NODE-XXX AIswitch Shell Connection  8
```

2. Use the **account/l** command sequence to list the configured user accounts and their permission status. Enter the following:

   account/l

   When you type the **account/l** command sequence, a screen similar to this appears:

```
>account/l
User Account Database
T with STATUS permission
W with WONG permission
JETSU with SUPERVISOR permission
GUY with SUPERVISOR permission

NODE-XXX AIswitch Shell Connection  8
```

3. Use the **account/d** command sequence to delete a user account. Enter the following:

   account/d *username*

   username is the username of the account you want to delete.

   When you type the **account/d** command sequence, a screen similar to this appears:

```
>account/d guy
Account deleted.
NODE-XXX AIswitch Shell Connection  8
```

Managing Permission Profiles

These procedures detail an example of the commands you might use to manage a permission profile.

1. Use the **accountp/a** command sequence to add a new permission profile to the AI180. Enter the following:

   accountp/a [*new prof name*] [*existing prof name*]

   new prof name is the name of the profile being created. *existing prof name* is status, mgmt, supervisor, ftp, or user-defined.

   A screen similar to this appears:

```
>accountp/a profile1 status

Permission profile added
NODE-XXX AIswitch Shell Connection  8
```

   A new permission profile is always based on a default permission profile or an existing permission profile.

   The four default permission profiles are status, mgmt, supervisor, and ftp. The **accountp** command accepts one of these names or the name of a previously configured profile name for the existing profile name menu item. The new profile name menu item may not be status, mgmt, supervisor, ftp, or the name of an existing command profile. Successfully executing this command creates a new permission profile which may then be modified by using the **accountp/e** command.

2. Use the **accountp/e** command sequence to edit or modify a permission profile. Enter the following:

   accountp/e *existing profile name* **+/-** *command*

   existing profile name is the name of an existing profile. **+/-** *command* allows you to add or delete a command to or from a profile.

   A screen similar to this appears:

```
>accountp/e profile1 - stat

PROFILE1 permission profile modified
NODE-XXX AIswitch Shell Connection  8
```

   Use this command sequence to edit a permission profile. When you edit a permission profile, a command is added or deleted from the profile. Use the **+** operator to add a command to the profile. Use the **-** operator to delete a command from the profile.

   When a command is contained within a profile, it may be executed by a user assigned to the command profile. Multiple edits may be executed on the same command line by repeating **+/-** *command* sequence.

3. Use the **accountp/d** command sequence to delete a permission profile. Enter the following:

   accountp/d *existing profile name*

   existing profile name is the name of the profile to delete.

   A screen similar to this appears:

```
>accountp/d profile1

Permission deleted
NODE-XXX AIswitch Shell Connection  0
```

   Use this command sequence to delete the specified permission profile. If any users are assigned to the permission profile you want to delete, a list of those users will be printed. If any of these users log in to the AI180, their permission profile will default to the status profile.

Note: The default profiles (status, mgmt, supervisor, and ftp) cannot be deleted.

4. Use the **accountp/l** *profile name* command sequence to list the commands and users assigned to a specified permission profile. Enter the following:

   accountp/l *profile name*

   profile name is the name of a profile to list.

   A screen similar to this appears:

```
>accountp/l profile1

Permission Profile: PROFILE1
User List:
Commands:
ACTIVE     ALRSHO     BYE        CLIST      DHOLD
DMPEE      HELP       INV        IOACT      LISTS
LO         LOGOFF     LOGOUT     LSTDSB     MENURO
NETSTA     PASSWORD   PLIST      REPEAT     SHELL
SHOBGC     SHOCLS     SHOLOG     SHOPRT     SLIST
STACLS     STAEIA     STAPRT     STASLC     STAT
STATES     STATUS     TFTPSTAT   TMRACT     TNLOGIN
WATCPU
NODE-XXX AIswitch Shell Connection  1
```

5. Use the **accountp/l** command to list the commands and users in all configured permission profiles. Enter the following:

   accountp/l

   When you type the **accountp/l** command, a screen similar to this appears:

```
>accountp/l

Permission Profile: PROFILE1
User List:
Commands:
ACTIVE     ALRSHO     BYE        CLIST      DHOLD
DMPEE      HELP       INV        IOACT      LISTS
LO         LOGOFF     LOGOUT     LSTDSB     MENURO
NETSTA     PASSWORD   PLIST      REPEAT     SHELL
SHOBGC     SHOCLS     SHOLOG     SHOPRT     SLIST
STACLS     STAEIA     STAPRT     STASLC     STAT
STATES     STATUS     TFTPSTAT   TMRACT     TNLOGIN
WATCPU
NODE-XXX AIswitch Shell Connection  3

Permission Profile: PROFILE2
User List:
Commands:
ACTIVE     ALRSHO     BYE        CLIST      DHOLD
DMPEE      HELP       INV        IOACT      LISTS
LO         LOGOFF     LOGOUT     LSTDSB     MENURO
NETSTA     PASSWORD   PLIST      REPEAT     SHELL
SHOBGC     SHOCLS     SHOLOG     SHOPRT     SLIST
STACLS     STAEIA     STAPRT     STASLC     STAT
STATES     STATUS     TFTPSTAT   TMRACT     TNLOGIN
WATCPU
NODE-XXX AIswitch Shell Connection  3
```

6. Use the **accountp/n** command to list the names of all permission profiles. Enter the following:

   accountp/n

   When you type the **accountp/n** command, a screen similar to this appears:

```
>accountp/n
Permission Profile Names:
STATUS       MGMT         SUPERVISOR     FTP           WONG
TEST1        T            T  T           PROFILE1
NODE-XXX AIswitch Shell Connection  8
```

System Configuration by Menu

This chapter describes how to navigate and configure the AI198 menu system.

You can use this menu system to configure the AI198 or to view the current configuration.

Guide to this Chapter

Starting and Ending a Menu Session

Starting a Menu Session

To access the AI198 menu system:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

Ending a Menu Session

To end a menu session:

1. In the Main Menu, enter **21**.
2. At the command prompt, enter **logoff**.

Note: You can also log off by entering **lo**, **bye**, or **logout**.

Navigating Menus

Menu Names

All menus following the Main Menu have a numerical name at the top right corner of the menu. This numerical name shows your location within the menu hierarchy. Each digit in the name represents a menu item that was previously selected. For example, Menu 4.2 indicates that menu item **4** was selected, and then menu item **2** was selected.

```
                                                                Menu 4.2
```

Selecting Menu Items

Each menu contains a list of numbered menu items that represent parameters that the system manager can configure. In general, to make a selection, type the number of the desired menu item and press ENTER. For some menu items, more data is required. When entering a menu item number it is not necessary to include leading zeros. For example, you can type **2** instead of **02**; both ways will work.

Types of Menu Items

These menu types are used on the AI198:

- Submenus
- Toggle Menu Items
- Data Menu Items
- Menu Item Functions

Submenus

A plus sign (+) next to a menu selection indicates that there is a submenu.

For example, Menu 1.13 reads:

```
13+Time and Date format is hh:mm:ss mmddyy
```

Some submenus ask you to make a selection from a list and then redisplay the previous menu showing your selection. Other submenus have their own submenus that request additional information. After saving your entries, the top-level menu redisplays.

Toggle Menu Items

Toggle menu items show two or more values that can be selected for a parameter. Toggle menu items have an asterisk (*) next to their menu item number. To select a value, type the menu item number and press ENTER. Each time you type the menu item number and press ENTER, you toggle to the next selection.

In this example, menu item 02 is a toggle menu item:

```
02*The display of connection information on user terminals is turned----------ON
```

For menu item `02*The display of connection information on user terminals is turned,` you can toggle between `ON` and `OFF`.

Data Menu Items

Data menu items request text entries (such as destination names and card descriptions) or numeric values (such as port numbers and IP addresses).

To enter information in a data menu item, type the menu item number followed by a comma, then the configuration information, and press ENTER.

To change what you have typed, use the BACKSPACE key to backup to the desired position in the text and retype the changes. However, once you press the ENTER key, changes can be made only by selecting that menu item and reentering the data.

In this example the menu item requests the destination name that you want to add, change, or delete.

```
01  The destination name to add, change or delete------------296S4
```

To enter the destination name `296S4`, you would type **`1,296S4`** and press ENTER.

The menu reappears showing the destination name that you entered.

```
01  The destination name to add, change or delete------------296S4
```

To change configuration data that has been entered for a menu item, type the menu item number followed by a comma, then enter the new data.

Menu Item Functions

Menu item functions appear at the bottom of each menu. Menu items 20 and 21 are common functions throughout the AI198. This sample screen shows the menu items, and Table 4-1 describes them.

```
20 Save the changes made
21 Exit this menu with no changes
```

Table 4-1 Menu Item Descriptions

Menu Item	Menu Item Description
20	Saves any updated configurations before exiting the menu.
21	Exits the menu without saving any changes. All items on the menu return to the previously configured values. **Note:** In order to exit a menu without saving changes, you must use this menu item; using keyboard shortcuts will not allow the CLC to properly free up the memory that was allocated during menu navigation.

Entering Multiple Menu Commands

You can specify multiple menu commands on a single line, rather than accessing submenus level by level. Enter each command separated by a blank space. For example, to prevent ports 16 to 48 from accessing the XDOT32 destination while in the Main Menu, enter the following command:

```
5 1 16 3,xdot32
```

In the first pair of numbers, **5** selects menu 5 and **1** selects menu item 5.1 (lowest port number to be restricted). The next number, **16**, is the value for the lowest port on the card (you only need to specify the low port; the high port for the card is automatically inserted). Finally, **3** selects Menu 5.3 (destination that these ports cannot access), and **xdot32** is the name of the destination.

The **config** commands Save (**-**) and End (**.**) abbreviations can also be used. See Appendix B: The config Command for details.

Entering AI Commands from the Menu System

AI commands can be performed from the menu system by preceding the command with an exclamation point (!):

```
!active
```

The **!active** command displays the active TDS connections on the AI180. Press ENTER to redisplay the current menu.

See the Chapter 8: Commands from the AI Prompt for details.

The following keys (listed in Table 4-2) are used to edit command lines:

Table 4-2 Keys to Edit Command Lines

Key	**Function**
Up and Down arrow keys	Recalls previous commands that were issued on the AI198. The AI198 saves 20 commands in its history per connection.
Left and Right arrow keys	Moves through the command you want to edit.
CTRL+k key	Removes all characters after the cursor.
CTRL+u key	Removes all characters before the cursor.
HOME key	Moves the cursor to the beginning of the line.
END key	Moves the cursor to the end of the line.
PAGE DOWN key	Moves the cursor to the last, or newest, command.
PAGE UP key	Moves the cursor to the first, or oldest, command.
BACKSPACE key	Removes the character to the left of the cursor.
DEL key	Removes the current character.

Configuring the AI198

The following sections provide you with procedures for configuring the AI198. Refer to Appendix D: Menu 4.2: Configure as... for assistance on configuring Smart Line Cards.

The configuration process will take you step-by-step through the menu system, covering these topics:

- Menu 1: Configure Options Affecting the System as a Whole
- Menu 2: Create, Delete, or Modify a Destination Name
- Menu 3: Display all Destination Names
- Menu 4: Configure Cards
- Menu 5: Set or Remove Connection Restrictions Based on Port Numbers
- Menu 6: Display all Connection Restrictions Based on Port Numbers
- Menu 7: Configure Slot Density
- Menu 8: Configure the Alias Translation Table
- Menu 9: Display the List of Alias Translation Entries
- Menu 10: Configuring the BOOTP Table

Menu 1: Configure Options Affecting the System as a Whole

Menu 1 allows you to set options that affect the system as a whole and are not aimed at a specific terminal or destination.

The menu items include these configuration procedures:

- Set Log and Alarm Thresholds
- Configuring User Terminals
- AIswitch Commands Issued upon Restart
- AIswitch Commands Issued After Configuration Restart
- Display of Destination Names and Automatic CLC Update
- Network Parameters (including IP and router address configuration)
- Time and Date Format
- SNMP Trap Table
- Configure Banner
- SNTP Configuration
- Login Security Configuration (including RADIUS and TACACS+)
- CLC Trap
- Exiting Menu 1

These parameters are usually configured first, but they can be configured at any time.

To configure options affecting the entire system:

1. Log onto the AI198.

2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. Enter **1** to select `01+Configure options affecting the system as a whole.` Menu 1 appears.

```
                                                                      Menu 1
01+Set log and alarm thresholds
02*The display of connection information on user terminals is turned---------ON
03 The duration of a long break sequence in 1/64 seconds-------------0000000120
04*The automatic baud rate detection system is turned------------------------ON
05*Printing of a destination name menu on user terminals is turned-----------ON
06*Allow ports of different speeds to be connected (down speed)--------------ON
07 The designator for this node is----------------AI198
08*Allow dual CPUs to automatically switch if fault--------------------------ON
09+AIswitch automatic commands
10*The display of destination names in four columns is turned---------------OFF
11*Automatic CLC update is-------------------------------------------------OFF
12+Network parameters
13+Time and Date format is hh:mm:ss mmddyy
14+SNMP Trap Table
15+Configure Banner
16+SNTP Configuration
17+Login Security Configuration
18 Interval of the faulted primary CLC trap (0..65535 min.)---------------00000

20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Set Log and Alarm Thresholds

This section is specific to Menu 1.1. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure options affecting the system as a whole.`
2. From Menu 1, enter **1** to select `01+Set log and alarm thresholds.` Menu 1.1 appears:

```
                                                                    Menu 1.1
01*The activity and alarm log is turned-----------------------------------OFF
02 The activity and alarm log prints on port number-----------------------000
03 Activity log severity threshold is-------------------------------------1
04 Minimum minor alarm severity threshold is-----------------------------2
05 Maximum minor alarm severity threshold is-----------------------------4
06 Minimum major alarm severity threshold is-----------------------------5
07 Maximum major alarm severity threshold is-----------------------------9
08+Craft baud rate is 9600 baud
09*Craft log echoing default is-------------------------------------------ON
10 CAAML routing string -
11 CAAML idle timer (1..255 sec, 0=disabled)-----------------------------010
12 CAAML retry timer (1..255 sec, 0=disabled)----------------------------010
.
.
20 Retain these changes for saving in Menu 1
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

3. Enter **1** to toggle `ON` or `OFF` the activity and alarm log. The default is `ON`. If `OFF` is selected, an activity log will not be available.

   The most recent log information is available using the sholog command.

   Note: The log port and the **sholog** command will not work if the designated port is set to autobaud, if the port has a destination name and cannot initiate calls, or if the port is turned off.

4. Type **2**, press SPACEBAR or (,), type *port_number*, and press ENTER to identity the port number to receive the activity and log alarm. For Example, **2** *16* provides this screen change:

```
02 The activity and alarm log prints on port number-----------------------016
```

5. Type **3**, press SPACEBAR or (,), type a value between 0 and 9, and press ENTER to assign the `activity log severity threshold`. The default is 1.

Note: For menu items three through seven, refer to Table 4-3 for a list and meanings of the severity levels.

Table 4-3 Severity Levels and Meanings

Level	Meaning
0	Normal activity.
1	Transient call error or error event (buffer quota, busy, etc.).
2	Transient link error (DCD on/off, loss of sync, and so on).
3	Severe call processing error.
4	A link is down (frame, packet).
5	A severe software error (memory corruption, window transaction, loss of data, and so on).
6	A partial hardware fault on a card (CLC/interface card).
7	A total hardware/software failure on an interface card (crash dump).
8	The A CLC has failed and has switched to the B CLC.
9	The system halted and the last CLC failed.

6. Type **4**, press SPACEBAR or (,), type a value between 0 and 9, and press ENTER to assign the `minimum minor alarm severity threshold`. The default is 2.

   Any message or alarm with a severity level equal to or greater than the assigned value will activate the minor alarm condition.

7. Type **5**, press SPACEBAR or (,), type a value between 0 and 9, and press ENTER to assign the `maximum minor alarm severity threshold`. The default is 4.

   Any message or alarm with a severity level equal to or less than the assigned value will activate the minor alarm condition.

8. Type **6**, press SPACEBAR or (,), type a value between 0 and 9, and press ENTER to assign the `minimum major alarm severity threshold`. The default is 5.

   Any message or alarm with a severity level equal to or greater than the assigned value will activate the major alarm condition.

9. Type **7**, press SPACEBAR or (,), type a value between 0 and 9, and press ENTER to assign the `maximum major alarm severity threshold`. The default is 9.

   Any message or alarm with a severity level equal to or less than the assigned value will activate the major alarm condition.

10. Enter **8** to set the craft baud rate. This screen appears:

```
                                                                    Menu 1.1.8
01 Craft baud rate is 50 baud
02 Craft baud rate is 75 baud
03 Craft baud rate is 110 baud
04 Craft baud rate is 134.5 baud
05 Craft baud rate is 300 baud
06 Craft baud rate is 600 baud
07 Craft baud rate is 1200 baud
08 Craft baud rate is 2400 baud
09 Craft baud rate is 3600 baud
10 Craft baud rate is 4800 baud
11 Craft baud rate is 7200 baud
12 Craft baud rate is 9600 baud
13 Craft baud rate is 19200 baud
14 Craft baud rate is 38.4K baud
15 Craft baud rate is 57.6K baud
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

11. Type the menu line number that corresponds with your desired baud rate setting, and press ENTER. The default is 9600.

    For example, enter **12** to set a baud rate of 9600.

    The CLC will return to Menu 1.1 automatically. To exit Menu 1.1.8 without editing, enter **21**.

```
                                                                      Menu 1.1
01*The activity and alarm log is turned-----------------------------------ON
02 The activity and alarm log prints on port number-------------------------000
03 Activity log severity threshold is-------------------------------------1
04 Minimum minor alarm severity threshold is------------------------------2
05 Maximum minor alarm severity threshold is------------------------------4
06 Minimum major alarm severity threshold is------------------------------5
07 Maximum major alarm severity threshold is------------------------------9
08+Craft baud rate is 9600 baud
09*Craft log echoing default is-------------------------------------------ON
10 CAAML routing string -
11 CAAML idle timer (1..255 sec, 0=disabled)------------------------------010
12 CAAML retry timer (1..255 sec, 0=disabled)-----------------------------010
.
.
20 Retain these changes for saving in Menu 1
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

12. Enter **9** to toggle ON or OFF the Craft log echoing default. The default is ON.
    - ON directs log messages to the craft port, as well as to the designated log port, anytime the AI198 is reset or booted.
    - OFF does not deliver log messages.

    Note: The echoing of log information to the craft port may be toggled on or off at any time by pressing CTRL+l (lowercase L).

13. Type **10**, press SPACEBAR or (,), type *routing_string*, and press ENTER. The routing string is in the same format as entries on the destination menu.

    If menu item **10** is blank, then CAAML is disabled, by default. This item may also provide routing information for the CAAML.

    Use CAAML to create a remote log of AI180 activity. When a log message occurs, and CAAML is enabled, a call is placed through an outgoing background connection. The log message is queued, and when the call connects, the log is sent through the background connection.

14. Type **11**, press SPACEBAR or (,), type a value between 0 and 255, and press ENTER to set the CAAML idle timer. The default is 10.

    If you set the timer to 0, the connection cannot be disconnected by the timer. Setting the timer for too long ties up resources. Setting it for too short a time may cause excessive call processing.

15. Type **12**, press SPACEBAR or (,), type a value between 0 and 255, and press ENTER to set the CAAML retry timer. The default is 10.

    Setting the timer to 0 prevents the CAAML call from being retried. Setting it for too long may allow the CAAML queue to flush excessive data. Setting it for too short a time may cause system problems due to excessive call processing.

16. Retain changes for saving in Menu 1, or exit without saving entries.
    - To retain changes, enter **20**. This returns you to Menu 1.
    - To exit without saving entries, enter **21**. This returns you to Menu 1.

Configuring User Terminals

This section is specific to Menus 1.2 through 1.8. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure options affecting the system as a whole`. Menu 1.1 appears.

```
                                                                    Menu 1
01+Set log and alarm thresholds
02*The display of connection information on user terminals is turned---------ON
03 The duration of a long break sequence in 1/64 seconds-------------0000000120
04*The automatic baud rate detection system is turned-----------------------ON
05*Printing of a destination name menu on user terminals is turned-----------ON
06*Allow ports of different speeds to be connected (down speed)--------------ON
07 The designator for this node is----------------AI198
08*Allow dual CPUs to automatically switch if fault--------------------------ON
09+AISwitch automatic commands
10*The display of destination names in four columns is turned---------------OFF
11*Automatic CLC update is-------------------------------------------------OFF
12+Network parameters
13+Time and Date format is hh:mm:ss mmddyy
14+SNMP Trap Table
15+Configure Banner
16+SNTP Configuration
17+Login Security Configuration
18 Interval of the faulted primary CLC trap (0..65535 min.)---------------00000

20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

2. Enter **2** to toggle `ON` or `OFF` the `display of connection information on user terminals`. The default is `ON`.

   - `ON` displays the user's port connection information on the user's terminals when the port is connected. The message will show the port number that is being connected. The same message will go to the activity and alarm log, if used (See Menu 1.1). This connection information can be useful when trying to debug system problems.
   - `OFF` does not display the user's terminal. The connection message will still be sent to the log, if one is used.

3. Type **3**, press SPACEBAR or (,), type a value between 120 and 3200, and press ENTER to determine `the duration of a long-break sequence in 1/64 second` increments. The default is 120.

   A long-break disconnection requires the user to press the BREAK key two or three times on a standard terminal before the user's port will disconnect. A long break is often used with systems that use the BREAK key for other functions during normal operations.

   On the AI180, a clock tick has a 1/64-second interval; therefore, there are 64 ticks per second. Initially, you should use 120 ticks (2 seconds) for this value. A time of 3200 ticks (50 seconds) can be specified if required. You could enter a larger number, but that would not be practical.

   

   Note: If a long-break sequence is not used, this value is ignored.

4. Enter **4** to toggle `ON` or `OFF` the `automatic baud rate detection system`. The default is `ON`.

5. Enter **5** to toggle `ON` or `OFF` the `printing of a destination name menu on a user terminal`. The default is `ON`.

   - `ON` displays a list of all the possible destinations on the user's terminal above the destination prompt.

   

   Note: This only appears on ports that allow selection of a destination via the keyboard.

   - `OFF` specifies the destinations are configured to place calls.

6. Enter **6** to toggle `ON` or `OFF` the option to `allow ports of different speeds to be connected`. The default is `ON`.

   - `ON` connects ports of different baud rates.
   - `OFF` prevents the connection if a baud rate mismatch occurs.

7. Type **7**, press SPACEBAR or (,), type *node_name*, and press ENTER to name your AI180 designator label. The designator label may be a maximum of 29 characters long.

```
07 The designator for this node is----------------AI198
```

   This label will be displayed before log messages and any other important information so that you can identify the node sending the message.

```
AI198AIswitch craft port
```

8. Enter **8** to toggle ON or OFF the option to `allow dual CPUs to automatically switch to fault`. The default is ON.

   This menu item should be turned on only in an AI180 equipped with two CLCs. The CLC selector switch on the noncabled side of the chassis must be set to AUTO to allow switching between CLCs. See the **swcpu** command description for testing this feature.

AIswitch Commands Issued upon Restart

This section is specific to Menu 1.9.1. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure options affecting the system as a whole`. Menu 1 appears.

```
                                                                    Menu 1
01+Set log and alarm thresholds
02*The display of connection information on user terminals is turned---------ON
03 The duration of a long break sequence in 1/64 seconds-------------0000000120
04*The automatic baud rate detection system is turned-----------------------ON
05*Printing of a destination name menu on user terminals is turned-----------ON
06*Allow ports of different speeds to be connected (down speed)--------------ON
07 The designator for this node is----------------AI198
08*Allow dual CPUs to automatically switch if fault--------------------------ON
09+AISwitch automatic commands
10*The display of destination names in four columns is turned---------------OFF
11*Automatic CLC update is-------------------------------------------------OFF
12+Network parameters
13+Time and Date format is hh:mm:ss mmddyy
14+SNMP Trap Table
15+Configure Banner
16+SNTP Configuration
17+Login Security Configuration
18 Interval of the faulted primary CLC trap (0..65535 min.)--------------00000

20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

2. Enter **9** to select `09+AISwitch automatic commands`. Menu 1.9 appears.

```
                                                                  Menu 1.9
01+AISwitch commands issued upon restart
02+AISwitch commands issued after configuration reset
.
.
.
21 Return to Menu 1
Enter item number and optional ",value" then push <CR> key
```

3. Enter **1** to configure a list of executable commands issued upon the restart of the system. Menu 1.9.1 appears.

```
                                                              Menu 1.9.1 pg 1
01
02
03
04
05
06
07
08
09
10
11
12
13
14

16 Previous page [,page]
17 Next page
18 Insert line
19 Delete line
20 Retain these changes for saving
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Type *menu_line*, press SPACEBAR or (,), type *command*, and press ENTER. For example, type **1**, press SPACEBAR or (,), type **alrclr**, and press ENTER to clear alarms when restarting the system.

```
                                                              Menu 1.9.1 pg 1
01 alrclr
```

CAUTION: Some commands should not be executed from this menu. These include: **cpycnf**, **repeat**, **lo**, **menu**, **mcon**, and **fast**. Use caution when configuring this menu. Typing some command combinations can make your chassis inoperable. See Chapter 8: Commands from the AI Prompt for information on specific commands.

You can enter up to 14 lines of commands on this page. If more lines are required, additional pages are available. You can toggle between the multiple pages and insert or delete lines using other selections on this menu.

Each line can contain up to 76 characters. If more than 76 characters are needed to perform a single command, continue the command on another line by using a backtick (‘) as the last character of the line that you wish to continue.

To prevent the commands on this list from executing during a restart, press ESC on the craft port during the initialization before phase 1 is complete. (See the CLC Initialization on page 2-4 for more information.)

5. Enter **16** to display the previous page of this menu. To view or change the strings on a specific page, enter the following command.

   16,*page*

6. Enter **17** to display or change the strings on the next page of this menu.
7. Type **18**, press SPACEBAR or (,), type *menu_line*, and press ENTER to insert a menu line.

   For example, typing **18**,*9* will move down menu line 9 and the menu lines that follow. The new menu line 9 will be available to configure.

8. Type **19**, press SPACEBAR or (,), type *menu_line*, and press ENTER to delete a menu line. The lines following the deleted line will move up.
9. Retain these changes for saving in Menu 1, or exit without saving entries.
   - To save entries, enter **20**. This returns you to Menu 1.
   - To exit without saving entries, enter **21**. This returns you to Menu 1.

AIswitch Commands Issued After Configuration Restart

This section is specific to Menu 1.9.2. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. Enter **9** to select `09+AISwitch automatic commands`. Menu 1.9 appears.

```
                                                                    Menu 1.9
01+AISwitch commands issued upon restart
02+AISwitch commands issued after configuration reset
.
.
21 Return to Menu 1
Enter item number and optional ",value" then push <CR> key
```

2. Enter **2** to configure a list of executable commands issued after a configuration reset. Menu 1.9.2 appears.

```
                                                              Menu 1.9.2 pg 1
01
02
03
04
05
06
07
08
09
10
11
12
13
14

16 Previous page [,page]
17 Next page
18 Insert line
19 Delete line
20 Retain these changes for saving
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

3. Type *menu_line*, press SPACEBAR or (,), type *command*, and press ENTER. For example, type **1**, press SPACEBAR or (,), type **alrclr**, and press ENTER to clear alarms each time the configuration is reset to factory defaults (see the selcnf command).

```
                                                              Menu 1.9.2 pg 1
01 alrclr
```

CAUTION: Use caution when configuring this menu. Typing some command combinations can make your chassis inoperable. See Chapter 8: Commands from the AI Prompt for information on specific commands.

See the configuration procedure (Step 28) for Menu 1.9.1 for details about typing strings on these lines.

The purpose of these commands is to facilitate a custom default configuration which overrides the factory defaults. This feature is intended specifically for use with commands which affect the system configuration, such as **config**, **eed**, and **cfgmsg**. The chassis is reset immediately following the execution of these command strings.

To prevent the commands on this list from executing during a restart, press ESC on the craft port during the initialization before phase 1 is complete. (See CLC Initialization on page 2-4 for more information.)

4. Enter **16** to display the previous page of this menu. To view or change the strings on a specific page, enter the following command.

   16,*page*

5. Enter **17** to display or change the strings on the next page of this menu.

6. Type **18**, press SPACEBAR or (,), type *menu_line*, and press ENTER to insert a new line.

   For example, typing **18**,*9* will move down menu line 9 and the menu lines that follow. The new menu line 9 will be available to configure.

7. Type **19**, press SPACEBAR or (,), type *menu_line*, and press ENTER to delete a menu line. The lines following the deleted line will move up.

8. Retain these changes for saving in Menu 1, or exit without saving entries.

   - To save entries, enter **20**. This returns you to Menu 1.
   - To exit without saving entries, enter **21**. This returns you to Menu 1.

Display of Destination Names and Automatic CLC Update

This section is specific to Menus 1.10 and 1.11. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure options affecting the system as a whole`. Menu 1 appears.

```
                                                                    Menu 1
01+Set log and alarm thresholds
02*The display of connection information on user terminals is turned---------ON
03 The duration of a long break sequence in 1/64 seconds-------------0000000120
04*The automatic baud rate detection system is turned------------------------ON
05*Printing of a destination name menu on user terminals is turned-----------ON
06*Allow ports of different speeds to be connected (down speed)--------------ON
07 The designator for this node is----------------AI198
08*Allow dual CPUs to automatically switch if fault--------------------------ON
09+AISwitch automatic commands
10*The display of destination names in four columns is turned---------------OFF
11*Automatic CLC update is---------------------------------------------------OFF
12+Network parameters
13+Time and Date format is hh:mm:ss mmddyy
14+SNMP Trap Table
15+Configure Banner
16+SNTP Configuration
17+Login Security Configuration
18 Interval of the faulted primary CLC trap (0..65535 min.)---------------00000

20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

2. Enter **10** to toggle ON or OFF the display of destination names in four columns. The default is ON.

   When the setting is OFF, the list of destination names is displayed in a single column.

3. Enter **11** to toggle ON of OFF the automatic CLC update. The default is ON.

   Select ON to automatically update the backup CLC when system configuration changes are made to the active CLC.

   Also, if only one CLC is mounted in the AI180 and a second CLC is inserted, the second CLC configuration automatically updates to match the active CLC. These conditions are required:

   - The chassis power supply must be turned on
   - Only one operating CLC is mounted in the chassis
   - The CLC selector switch must be set to AUTO
   - Menu item 1.11 of the operating CLC must be set to ON
   - Both CLCs must have the same software version.

   When the second CLC is inserted into the AI180, the configuration of the active CLC will then be copied over. During the update process, the LOAD LEDs on the faceplate of the second CLC will display an active pattern.

Network Parameters

This section is specific to Menu 1.12. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure Options Affecting System as a whole`. Menu 1 appears.

2. From Menu 1, enter **12** to set the following network parameters:
   - CLC IP addresses, router address, and subnet mask
   - Telnet server port number
   - FTP server control port number

   Menu 1.12 appears.

```
                                                                    Menu 1.12
01 CLC IP address (0.0.0.0..255.255.255.254)--------------------172.016.033.203
02 CLC Router address (0.0.0.0..255.255.255.254)----------------172.016.000.001
03 CLC Subnet mask (0.0.0.0..255.255.255.254)-------------------255.255.000.000
04 Telnet server port number (1..65535)-----------------------------------00023
05 FTP server control port number (1..65535)-----------------------------00021
06 Read Community Name-------------------------------------------------public
07 Write Community Name-----------------------------------------administrator
08 SNMP Node Name------------------------------------------------------------
09 SNMP Contact Person-------------------------------------------------------
10 SNMP Location-------------------------------------------------------------
.
.
20 Retain these changes for saving in Menu 1
21 Exit this menu
Enter item number and optional ",value" then push <CR> key
```

3. Type **1**, press SPACEBAR or (,), type *CLC_IP_address*, and press ENTER. Example: 172.016.033.203. The IP address can be the same for both the active and backup CLC.
4. Type **2**, press SPACEBAR or (,), type *CLC_Router_address*, and press ENTER. Example: 172.016.000.001.
5. Type **3**, press SPACEBAR or (,), type *CLC_Subnet_mask*, and press ENTER. Example: 255.255.000.000.
6. Type **4**, press SPACEBAR or (,), type *Telnet_server_port_number*, and press ENTER. The default is 23.
7. Type **5**, press SPACEBAR or (,), type *FTP_server_control_port_number*, and press ENTER. The default is 21.
8. Type **6**, press SPACEBAR or (,), type *Read_Community_Name*, and press ENTER to define who may have read access to the CLC Management Information Base (MIB). The maximum character limit is 32.
9. Type **7**, press SPACEBAR or (,), type *Write_Community_Name*, and press ENTER to define who may have write access to the CLC Management Information Base (MIB). The maximum character limit is 32.
10. Type **8**, press SPACEBAR or (,), type *SNMP_Node_Name*, and press ENTER to assign the name that the CLC will use on the SNMP network. The maximum character limit is 40.

11. Type **9**, press SPACEBAR or (,), type *SNMP_Contact_Person*, and press ENTER to name the person responsible for SNMP interaction with the AI198. This is a free-form field that may contain up to 40 characters.
12. Type **10**, press SPACEBAR or (,), type *SNMP_Location*, and press ENTER to display the location of the AI198 within the SNMP network. This is a free-form field that may contain up to 40 characters.
13. Retain these changes for saving in Menu 1, or exit without saving entries.
    - To save entries, enter **20**. This returns you to Menu 1.
    - To exit without saving entries, enter **21**. This returns you to Menu 1.

Time and Date Format

This section is specific to Menu 1.13. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure Options Affecting System as a whole`. Menu 1 appears.
2. From Menu 1, enter **13** to select `13+time and date format`. Menu 1.13 appears.

```
                                                                Menu 1.13
01 Time and Date format is hh:mm:ss mmddyy
02 Time and Date format is hh:mm:ss mm/dd/yy
03 Time and Date format is hh:mm:ss mmddccyy
04 Time and Date format is hh:mm:ss mm/dd/ccyy
05 Time and Date format is hh:mm:ss ddmmyy
06 Time and Date format is hh:mm:ss dd/mm/yy
07 Time and Date format is hh:mm:ss ddmmccyy
08 Time and Date format is hh:mm:ss dd/mm/ccyy
09 Time and Date format is ccyymmdd hh:mm:ss
10 Time and Date format is ccyy/mm/dd hh:mm:ss
11 Time and Date format is hh:mm:ss dddccyy
12 Time and Date format is hh:mm:ss ddd/ccyy
13 Time and Date format is ccyyddd hh:mm:ss
14 Time and Date format is mmm dd ccyy hh:mm:ss
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

3. Enter the menu line that correlates with your desired setting. Refer to Table 4-4 for examples of the various time and date formats.

Table 4-4 Time and Date Format Examples

Format	Example
hh:mm:ss mmddyy	13:16:41 020701
hh:mm:ss mm/dd/yy	13:16:41 02/07/01
hh:mm:ss mmddccyy	13:16:41 02072001
hh:mm:ss mm/dd/ccyy	13:16:41 02/07/2001
hh:mm:ss ddmmyy	13:16:41 070201
hh:mm:ss dd/mm/yy	13:16:41 07/02/01
hh:mm:ss ddmmccyy	13:16:41 07022001
hh:mm:ss dd/mm/ccyy	13:16:41 07/02/2001
ccyymmdd hh:mm:ss	20010207 13:16:41
ccyy/mm/dd hh:mm:ss	2001/02/07 13:16:41
hh:mm:ss dddccyy	13:16:41 0382001
hh:mm:ss ddd/ccyy	13:16:41 038/2001
ccyyddd hh:mm:ss	2001038 13:16:41
mmm dd ccyy hh:mm:ss	Feb. 07, 2001 13:16:41

4. To select the format `hh:mm:ss dd/mm/yy`, enter **6**. This will take you back to Menu 1 with the new format selected.

```
13+Time and Date format is hh:mm:ss dd/mm/yy
```

Note: To exit this menu without selecting a new format, enter **21**.

SNMP Trap Table

This section is specific to Menu 1.14. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure Options Affecting System as a whole`. Menu 1 appears.
2. From Menu 1, enter **14** to select `14+SNMP Trap Table`. Menu 1.14 appears.

```
                                                                Menu 1.14
SNMP Trap Table
02 172.16.31.105
03 172.16.31.110
04
05
06
.
.
20 Retain these changes for saving in Menu 1
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

3. To enter an IP address into the trap table, type the line number (numbered **02** through **06**), press SPACEBAR or (,), type *ip_address*, and press ENTER. For example:

   2,172.16.31.105

```
02 172.16.31.105
```

   Note: The 198 will not allow you to enter a duplicate IP address.

4. Retain these changes for saving in Menu 1, or exit without saving entries.
   - To save entries, enter **20**. This returns you to Menu 1.
   - To exit without saving entries, enter **21**. This returns you to Menu 1.

Configure Banner

This section is specific to Menu 1.15. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select *01+Configure Options Affecting System as a whole*. Menu 1 appears.

2. From Menu 1, enter **15** to select `15+Configure Banner`. Menu 1.15 appears.

```
                                                                  Menu 1.15
Banner Edit Menu
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16



20 Retain these changes for saving in Menu 1
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

   The welcome banner can be up to 15 lines long (numbered 02 through 16); each line can contain up to 76 characters. You may enter any text you would like in the banner, from a simple welcome message to a security warning.

3. To enter a banner line, type the line number, press SPACEBAR or (,), type your text, and press ENTER. For example:

   `2, Welcome to the AI Switch`

   All lines with text will display when a user arrives at the chassis Welcome Screen, or logs in through the craft port. Blank lines will not print unless they are surrounded by lines with text. For example, consider the banner:

```
02 Welcome to the AI Switch
03 For authorized use only
04
05
06 Remember that the AI Password has changed!
```

   Lines 02, 03, and 06 would print, since they all contain text. Lines 04 and 05 would be displayed as blank lines, since they have text-filled lines on both sides.

4. Retain these changes for saving in Menu 1, or exit without saving entries.

   - To save entries, enter **20**. This returns you to Menu 1.
   - To exit without saving entries, enter **21**. This returns you to Menu 1.

SNTP Configuration

This section is specific to Menu 1.16. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure Options Affecting System as a whole`. Menu 1 appears.
2. Enter **16** to select `16+SNTP Configuration`. Menu 1.16 appears.

```
                                                                    Menu 1.16
01 Time Zone-------------------------------------------------------  00:00
02*Daylight Savings------------------------------------------------------OFF
03*SNTP------------------------------------------------------------------OFF
04 SNTP Server Primary Address-----------------------------------000.000.000.000
05 SNTP Server Secondary Address---------------------------------000.000.000.000
06 Poll Interval (1-65535 minutes)---------------------------------------01440
.
.
20 Retain these changes for saving in Menu 1
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

3. Type **1**, press SPACEBAR or (,), type *time_zone*, and press ENTER to set a specific time zone. Use the (+) parameter to indicate a time zone East of the UTC. Use the (-) parameter to indicate a time zone west of the UTC. For example, Eastern Standard Time: -05:00.

```
                                                                    Menu 1.16
01 Time Zone------------------------------------------------------------ -05:00
```

4. Enter **2** to toggle `ON` or `OFF` the `Daylight Savings` time setting.
5. Enter **3** to toggle `ON` or `OFF` the `SNTP` setting.
6. Type **4**, press SPACEBAR or (,), type *ip_address*, and press ENTER to set the IP address for your primary SNTP server.
7. Type **5**, press SPACEBAR or (,), type *ip_address*, and press ENTER to set the IP address for your secondary SNTP server.
8. Type **6**, press SPACEBAR or (,), type *poll_interval*, and press ENTER to designate how often the CLC will ask the servers for the current time.
9. Retain these changes for saving in Menu 1, or exit without saving entries.
   - To save entries, enter **20**. This returns you to Menu 1.
   - To exit without saving entries, enter **21**. This returns you to Menu 1.

Login Security Configuration

This section is specific to Menu 1.17. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

Notes: RADIUS and TACACS+ cannot be enabled at the same time.

There may be up to a 60 second delay while the CLC saves the RADIUS changes.

RADIUS Configuration

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure Options Affecting System as a whole`. Menu 1 appears.
2. Enter **17** to select `17+Login Security Configuration`. Menu 1.17 appears.

```
>17
                                                                    Menu 1.17

01+Radius Configuration
02+TACACS+ Configuration
.
.


21 Return to Menu 1
Enter item number and optional ",value" then push <CR> key
```

3. Enter **1** for `RADIUS Configuration`. Menu 1.17.1 appears.

```
                                                                  Menu 1.17.1
01*Radius Status (Disabled, Local Fallback, Enabled)-------------      DISABLED
02 RADIUS Server Primary Address-------------------------------000.000.000.000
03 RADIUS Server Primary Port (1..65535)-----------------------------------01812
04 Primary RADIUS Server's Secret----------------------                 applied
05 RADIUS Server Secondary Address-----------------------------000.000.000.000
06 RADIUS Server Secondary Port (1..65535)---------------------------------01812
07 Secondary RADIUS Server's Secret--------------------                 applied
.
.
20 Retain these changes for saving in Menu 1
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

The AI198 supports Remote Authentication Dial-in User Service (RADIUS) - a client/server-based authentication software system that supports remote access applications. RADIUS allows you to maintain user profiles in a centralized database. RADIUS resides on an authentication server which can be shared by multiple remote access clients.

Refer to Table 4-5 for information about the RADIUS Service types and their associated AI198 permission levels.

Table 4-5 RADIUS Service Types and User Profiles

RADIUS Service Type	**AI198 Permission Levels**
NAS Prompt Callback NAS Prompt other/unspecified	status
Login Framed Callback Login Callback Framed Outbound	management
Administrative	supervisor

Notes: All logins support RADIUS except the following: SLC logins and background connections do not use RADIUS, and FTP will not support RADIUS challenges.

- Only one RADIUS login can occur at one time.
- The maximum number of simultaneous connections to the CLC through Telnet is 10, only when RADIUS is enabled.
- IMPORTANT! The only way to access the AI198 is if a remote server accepts the login, or if `Local Fallback` is enabled, and an attempt to contact the RADIUS server(s) fails. It is suggested that you configure a local user account with `Local Fallback` enabled.

4. Enter **1** to toggle DISABLED, LOCAL FALLBACK, or ENABLED for RADIUS Status. Refer to Table 4-6 for a description of these options.

Table 4-6 RADIUS Status Types

RADIUS Status Type	Description
Disabled	Disabling the primary RADIUS server.
Local Fallback	The CLC will fallback to the local server if it fails when attempting to contact the RADIUS primary and secondary servers.
Enabled	Enabling the primary RADIUS server.

Note: The number of simultaneous connections to the CLC through TELNET is 10.

5. Type **2**, press SPACEBAR or (,), type *ip_address*, and press ENTER to set your primary RADIUS server. The default is 0.0.0.0. For example, to set 172.16.33.203 as the primary RADIUS server, enter the following.

```
2 172.16.33.203
```

6. Type **3**, press SPACEBAR or (,), type *primary_port* number, and press ENTER to configure the RADIUS Server Primary Port. The default is 1812. (The default on previous CLC versions was 1645.)

7. Type **4**, press SPACEBAR or (,), type *primary_RADIUS_server's_secret*, and press ENTER to setup your secret. You can type up to 24 alphanumeric characters.

Note: The secret that you enter here is a shared secret that must match the secret configured on the RADIUS server.

8. Type **5**, press SPACEBAR or (,), type *ip_address*, and press ENTER to set your secondary RADIUS server. The default is 0.0.0.0. For example, to set 172.16.33.204 as the secondary RADIUS server, enter the following.

```
5 172.16.33.204
```

9. Type **6**, press SPACEBAR or (,), type *secondary_port* number, and press ENTER to configure the RADIUS Server Secondary Port. The default is 1812. (The default on previous CLC versions was 1645.)

10. Type **7**, press SPACEBAR or (,), type *secondary_RADIUS_server's_secret*, and press ENTER to set up your secret. You can type up to 24 alphanumeric characters.

    Note: The secret that you enter here is a shared secret that must match the secret configured on the RADIUS server.

11. Retain these changes for saving in Menu 1, or exit without saving entries.

    - To save entries, enter **20**. This returns you to Menu 1.
    - To exit without saving entries, enter **21**. This returns you to Menu 1.

TACACS+ Configuration

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select `01+Configure Options Affecting System as a whole`. Menu 12 appears.
2. Enter **17** to select `17+Login Security Configuration`. Menu 1.17 appears.

```
>17
                                                                    Menu 1.17

01+Radius Configuration
02+TACACS+ Configuration
.
.

21 Return to Menu 1
Enter item number and optional ",value" then push <CR> key>
```

3. Enter **2** for `TACACS+ Configuration`. Menu 1.17.2 appears.

```
>2
                                                                  Menu 1.17.2
01*TACACS Status (Disabled, Local Fallback, Enabled)------------      DISABLED
02 TACACS Server Primary Address-------------------------------000.000.000.000
03 TACACS Server Primary Port (1..65535)-----------------------------------00049
04 Primary TACACS Server's Secret----------------------                 applied
05 TACACS Server Secondary Address-----------------------------000.000.000.000
06 TACACS Server Secondary Port (1..65535)---------------------------------00049
07 Secondary TACACS Server's Secret--------------------                 applied
.
.

20 Retain these changes for saving in Menu 1
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

The AI198 supports Terminal Access Controller Access Control System (TACACS+). TACACS+ authenticates the password and then authorizes the permission level of the user. If authentication passes, but authorization fails, the user is granted status access. In order to authorize the user, the TACASCS+ server must return a `priv_lvl` attribute when the CLC gives an authorization request with the arguments `"service=shell"` and `"cmd="`.

For example, the following TACACS+ configuration file entry will authorize the username `ClcSuper` with password `Pass` as the supervisor, and the username `ClcMgmt` with password `Mgmt` as management:

```
key="applied"                    # Same as menu 1.17.2.4

user = "ClcSuper" {
  login = cleartext "Pass"
  service = exec {
    priv_lvl = 15                # TAC_PLUS_PRIV_LVL_MAX = 15
  }
}

user = "ClcMgmt" {
  login = cleartext "Mgmt"
  service = exec {
    priv_lvl = 1                 # TAC_PLUS_PRIV_LVL_USER = 1
  }
}
```

Note: In the above example, the `#` character denotes a comment. Any text written after a `#` is ignored.

Refer to Table 4-7 for information about the TACACS+ service types and their associated privilege levels and AI198 permission levels.

Table 4-7 TACACS+ Service Types, Privilege Values, and Permission Levels

TACACS+ Service Type	priv_lvl Value	AI198 Permission Levels
TAC_PLUS_PRIV_LVL_MIN *other/unspecified*	0	status
TAC_PLUS_PRIV_LVL_USER	1 - 14	management
TAC_PLUS_PRIV_LVL_MAX TAC_PLUS_PRIV_LVL_ROOT	15	supervisor

4. Enter **1** to toggle `Disabled`, `Local Fallback`, or `Enabled` for TACACS+ Status. Refer to Table 4-8 for a description of these options.

Table 4-8 TACACS+ Status Types

TACACS+ Status Type	Description
Disabled	Disabling the primary TACACS+ server.
Local Fallback	The CLC will fallback to the local security if it fails when attempting to contact the TACACS+ primary and secondary servers.
Enabled	Enabling the primary TACACS+ server.

Notes: IMPORTANT! The only way to access the AI198 is if a remote server accepts the login, or if `Local Fallback` is enabled, and an attempt to contact the TACACS+ server(s) fails. It is suggested that you configure a local user account or configure a password for destination (dest) **ai** with `Local Fallback` enabled.

- Only one TACACS+ login can occur at one time.
- The maximum number of simultaneous connections to the CLC through Telnet is 10, only when TACACS+ is enabled.

5. Type **2**, press SPACEBAR or (,), type *ip_address*, and press ENTER to set your primary TACACS+ server. The default is 0.0.0.0. For example, to set 172.16.33.203 as the primary TACACS+ server, type the following and press ENTER.

```
2 172.16.33.203
```

6. Type **3**, press SPACEBAR or (,), type *primary_port number*, and press ENTER to configure the TACACS+ Server Primary Port. The default is 49.
7. Type **4**, press SPACEBAR or (,), type *primary_TACACS_server's_secret*, and press ENTER to setup your secret. You can type up to 24 alphanumeric characters. The default is applied.

   Notes: The secret that you enter here is a shared secret that must match the secret (also known as "key") configured on the TACACS+ server.

   When the TACACS+ secret is configured as empty (""), the CLC defaults to no encryption on TACACS+ communications. This is not recommended except when debugging, therefore you should always have a secret in place.
8. Type **5**, press SPACEBAR or (,) type *ip_address*, and press ENTER to set your secondary TACACS+ server. The default is 0.0.0.0. For example, to set 172.16.33.204 as the secondary TACACS+ server, enter the following.

   5 172.16.33.204
9. Type **6**, press SPACEBAR or (,), type *secondary_port number*, and press ENTER to configure the TACACS+ Server Secondary Port. The default is 49.
10. Type **7**, press SPACEBAR or (,) type *secondary_TACACS_server's_secret*, and press ENTER to set up your secret. You can type up to 24 alphanumeric characters. The default is applied.

    Note: The secret that you enter here is a shared secret that must match the secret configured on the TACACS+ server.
11. Retain these changes for saving in Menu 1, or exit without saving entries.
    - To save entries, enter **20**. This returns you to Menu 1.
    - To exit without saving entries, enter **21**. This returns you to Menu 1.

CLC Trap

This section is specific to Menu 1.18. However, any changes made in this menu will not take effect until you have completed the Menu 1 configuration, and have selected Menu 1.20 (see Exiting Menu 1 on page 4-36).

To continue Menu 1 configuration:

1. From the Main Menu, enter **1** to select 01+Configure Options Affecting System as a whole. Menu 1 appears.
2. Type **18**, press SPACEBAR or (,), type *interval_of_the_faulted_primary_CLC_trap*, and press ENTER.

Exiting Menu 1

1. Save entries made to Menu 1, or exit without saving entries.
   - To save entries, enter **20**. This returns you to the Main Menu.
   - To exit without saving entries, enter **21**. This returns you to the Main Menu.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

2. Enter **21** to exit the menu system. The command prompt appears.

```
AI198AISwitch craft port
```

Configuration for Menu 1 is complete.

Menu 2: Create, Delete, or Modify a Destination Name

Menu 2 enables you to create, delete, and modify a destination name. This menu must be configured before configuring Menu 4.

This menu provides these configuration options:

- Create or Modify a Destination Name
- Delete a Destination Name

Create or Modify a Destination Name

To create or modify a destination name:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu

01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. From the Main Menu, enter **2** to select `02+Create, delete, or modify a destination name`. Menu 2 appears.

```
                                                                  Menu 2
01 The destination name to add, change, or delete----------------------********
02*Ports in this destination are connected via ring simulation-------------OFF
03 How long to wait for host answer if using ring simulation---------0000000000
04*Allow a user to wait for a free port if all ports are busy---------------ON
05*Allow devices connected to this destination to initiate calls------------OFF
06*Disable the user's disconnect key(s) when connected here-----------------OFF
07*Display this destination name in the menu--------------------------------ON
08*Check baud rates before connecting to this destination-------------------ON
09*If ON the destination is another data switch-----------------------------OFF
10*If ON the timer is an activity timer, OFF is session timer--------------OFF
11 Duration of session or activity timer, or 0=OFF------------------0000000000
12 Time to wait before using the port again after disconnect---------0000000000
13 Destination password-------------------------------------------------
14 Shell/Queue-override password----------------------------------------
15+Set additional destination features



19 Delete this destination name
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Type **1**, press SPACEBAR or (,), type *destination_name*, and press ENTER to select the destination name that you wish to add or change.

   Destination names have a maximum character limit of 8. The name will be converted to uppercase characters after typing. A destination name can be alphanumeric, but must not contain the following characters: (**!**), (**"**), (**'**), (**#**), (**$**), (**%**), (**&**), (**+**), (*****), (**(**), (**)**), or (**,**).

5. Enter **2** to toggle `ON` or `OFF` the ring simulation connection. The default is `OFF`.

   Select `ON` to program the chassis to simulate a modem-controlled connection to a host computer, allowing positive security control over these connections.

6. Type **3**, press SPACEBAR or (,), type *clock_ticks* (value between 0 and 16,777,215), and press ENTER to specify the time frame the chassis will wait for a ring simulation connection. The default is 0.

   If your host does not answer within this time, the system displays this message and prints a warning on the log terminal:

   ```
   Requested destination does not answer - try again
   ```

   This menu is valid only if menu item 2.2 is set to `ON`.

7. Enter **4** to toggle ON or OFF the option that `allows the user to wait for a free port if all ports are busy`. The default is ON.

   If set to ON, the system allows you to wait for a free port if all ports are busy. In this case, the system displays this message:

   ```
   All ports are busy - do you wish to wait?
   ```

   Enter **Y** or **N**.

   If set to OFF, the system takes you to the Select Destination Menu whenever there are no free ports.

8. Enter **5** to toggle ON or OFF the option that `allows devices connected to this destination to initiate calls`. The default is OFF.

   - ON allows the devices to initiate an outgoing connection.
   - OFF prevents unsolicited messages from being sent. AI recommends that you initially leave this item as OFF.

9. Enter **6** to toggle ON or OFF to `disable the user's disconnect key(s) when connected here`. The default is OFF.

   - OFF disconnects using the method programmed for this port (press BREAK).
   - ON restricts users from initiating disconnections from ports when accessing certain destinations. This ensures that your host has terminated the user's job before signaling the chassis to disconnect.

10. Enter **7** to toggle ON or OFF the destination name display in this menu. The default is ON.

    - ON displays the destination name entered in menu item 1 on the Destination Name Menu.
    - OFF hides the destination name.

11. Enter **8** to toggle ON or OFF the option to check baud rates before connecting. The default is ON.

    - ON ensures that ports of compatible speeds are connected.
    - OFF allows the chassis to connect regardless of speed. This state is typically used to allow devices with different speeds to share a printing device.

12. Enter **9** to toggle ON or OFF the destination trunk status. The default is OFF.

    - ON connects the ports to another chassis. No messages will print with this setting.
    - OFF prints messages to connecting and disconnecting users.

13. Enter **10** to toggle ON or OFF to determine the timer. The default is OFF.
    - ON limits the length of inactivity.
    - OFF controls the allowable length of a session.
14. Type **11**, press SPACEBAR or (,), type *clock_ticks*, and press ENTER to configure the duration of session or activity timer. There are 64 clock ticks per second. The default is 0.

Table 4-9 Timer Settings in Relationship to Menu Item 2.10

If Menu Item 2.10 is Set to...	**Then Menu Item 2.11...**
ON (inactivity timer)	Lets you set the length of time your terminal can remain idle before the chassis disconnects.
OFF (session timer)	Lets you set the length of time you can be connected to this destination, regardless of the amount of activity on the port. When the connection involves a Smart Line Card, a forced disconnection string is not sent.
0	Activity and session length is not limited.

15. Type **12**, press SPACEBAR or (,), type *clock_ticks*, and press ENTER to configure the time to wait after disconnecting. There are 64 clock ticks per second. The default is 0, which allows immediate reconnection.

    You can set the length of time that must elapse before reconnection is available. This ensures that the host computer sees the disconnection before connecting another user to the system.
16. Type **13**, press SPACEBAR or (,), type *destination_password*, and press ENTER to set the destination password.

    Passwords have a maximum character limit of 8. A password can be alphanumeric, but must not contain the following characters: (**!**), (**"**), (**'**), (**#**), (**$**), (**%**), (**&**), (**+**), (*****), (**(**), (**)**), or (**,**).

17. Type **14**, press SPACEBAR or (,), type *shell_password*, and press ENTER to verify access to the chassis for functions such as using FTP to download software. (See FTP Method on page 6-7 in Chapter 6: Downloading Software and Configurations.)

    This function enables you to override your queue position, and allows the system manager to move to the beginning of the queue. If you receive the message:

    ```
    Do you wish to wait (Y/N)?
    ```

    Enter **Y** or **N**. Enter *password*. This is only available with a destination name that has menu item 2.4 turned ON.

18. Enter **15** to select `15+Set additional destination features`. Menu 2.15 appears.

```
                                                                Menu 2.15
01 Menu message string----------------------------
02 A string to be forced to these ports at connect time
---
04 A string to be forced to these ports at disconnect time
---
.
.
.
20 Retain these changes for saving in Menu 2
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

19. Type **1**, press SPACEBAR or (,), type *menu_message_string*, and press ENTER to specify a message of up to 29 characters.

    If the four-column mode in menu item 1.10 is set to OFF, the message defined here will be displayed next to the destination name.

    This menu item can print data about a computer operation schedule, and menu mode, without logging into the computer.

20. Type **2**, press SPACEBAR or (,), type *message_string*, and press ENTER to specify a message of up to 15 characters.

    To encode a control character, use a decimal ASCII equivalent. See Appendix A: ASCII Codes for details.

    Note: Use this menu item with the AI183 and AI185 only.

21. Type **4**, press SPACEBAR or (,), type *message_string*, and press ENTER to specify a message of up to 15 characters.

    To encode a control character, use a decimal ASCII equivalent. See Appendix A: ASCII Codes for details.

    Note: Use this menu item with the AI183 and AI185 only.

22. Retain these changes for saving in Menu 2, or exit without saving entries.
    - To save entries, enter **20**. This returns you to Menu 2.
    - To exit without saving entries, enter **21**. This returns you to Menu 2.
23. Save entries made to Menu 2, or exit without saving entries.
    - To save entries, enter **20**. This returns you to the Main Menu.
    - To exit without saving entries, enter **21**. This returns you to the Main Menu.
24. Enter **21** to exit the menu system. The command prompt appears.

Configuration for Menu 2 is complete.

Delete a Destination Name

To delete a destination name:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. From the Main Menu, enter **2** to select `02+Create, delete, or modify a destination name`. Menu 2 appears.

```
                                                                  Menu 2
01 The destination name to add, change, or delete----------------------********
02*Ports in this destination are connected via ring simulation-------------OFF
03 How long to wait for host answer if using ring simulation---------0000000000
04*Allow a user to wait for a free port if all ports are busy---------------ON
05*Allow devices connected to this destination to initiate calls------------OFF
06*Disable the user's disconnect key(s) when connected here-----------------OFF
07*Display this destination name in the menu--------------------------------ON
08*Check baud rates before connecting to this destination--------------------ON
09*If ON the destination is another data switch-----------------------------OFF
10*If ON the timer is an activity timer, OFF is session timer---------------OFF
11 Duration of session or activity timer, or 0=OFF------------------0000000000
12 Time to wait before using the port again after disconnect---------0000000000
13 Destination password-------------------------------------------------
14 Shell/Queue-override password---------------------------------------
15+Set additional destination features
.
.
19 Delete this destination name
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Type **1**, press SPACEBAR or (,), type *destination_name*, and press ENTER to select the destination name that you wish to delete.
5. Enter **19** to delete this destination name.
6. Save entries made to Menu 2, or exit without saving entries.
   - To save entries, enter **20**. This returns you to the Main Menu.
   - To exit without saving entries, enter **21**. This returns you to the Main Menu.
7. Enter **21** to exit the menu system. The command prompt appears.

```
AI198AISwitch craft port
```

Configuration for Menu 2 is complete.

Menu 3: Display all Destination Names

Menu 3 allows you to view all destination names currently maintained in the CLC.

To view all destination names:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
 >menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. From the Main Menu, enter **3** to select `03+Display all destination names`. Menu 3 appears.

```
>3
                                                                        Menu 3
01 The following destination names have been defined

Name     Pts Name     Pts Name     Pts Name     Pts Name     Pts Name     Pts
AI       000
.
.
<CR> Show more destination names
21 Return to Main Menu
Enter item number and optional ",value" then push <CR> key
```

These fields display:

Name This field is the destination name as defined in menu item 2.1.

Pts This field is the number of ports associated with the destination name.

4. Press ENTER to continue the display if destination names appear on more than one screen.
5. Enter **21** to exit the display. The Main Menu appears.
6. Enter **21** to exit the menu system. The command prompt appears.

```
AI198AISwitch craft port
```

Configuration for Menu 3 is complete.

Menu 4: Configure Cards

Menu 4 allows you to configure specific destinations, specific Smart Line Cards, and ports within those cards to access the destinations.

Configure the destinations in Menu 2: Create, Delete, or Modify a Destination Name before altering port configurations in Menu 4.

This section includes these configuration procedures:

- Baseport Configuration
- Card Destination Name
- Card Description

Note: For Smart Line Card configuration procedures (such as the AI232, AI296, AIfocus 3200, AIwan E1/T1, etc.), refer to the specific User's Guides.

To configure Menu 4:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu

01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. Enter **4** to `configure cards`. Menu 4 appears.

```
>4
                                                                    Menu 4
01 The baseport of the card to edit is-------------------------------------***
02+Configure as Empty Slot
03 The card's destination name is-----------------------------------------N/A
04 The card's description is----------------------------------------------N/A
05*Card is included when * is used with STPSLC, DISABL, or ENABL------------N/A









18+Card initialization strings--------------------------------------------N/A

20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
>
```

4. Type **1**, press SPACEBAR or (,), type *baseport*, and press ENTER to select the baseport that you want to configure. See the screen below for an example.

```
                                                                    Menu 4
01 The baseport of the card to edit is-------------------------------------000
```

You may also specify the slot number of the card to configure. To do this, type **1**, press SPACEBAR or (,), type **S**, press SPACEBAR or (,), type *slot_number*, and press ENTER. See the screen below for an example.

```
                                                                    Menu 4
01 The baseport of the card to edit is-------------------------------------000
```

5. Enter **2** to configure your Smart Line Card.

When you first enter Menu 4, before specifying a baseport, the prompt for item 2 defaults to `Configure as Empty Slot`. Once you specify a baseport, the card type defaults to the card type previously configured for that port.

Note: Refer to Appendix D: Menu 4.2: Configure as... for specific card configurations.

6. Save changes made to Menu 4, or exit without saving entries.
   - To save entries, enter **20**. This returns you to Menu 4.
   - To exit without saving entries, enter **21**. This returns you to Menu 4.

   Note: Changes made to these submenus are not saved until you choose menu item 4.20. At that time, all changes are saved. Some changes do not take effect until the system or affected Smart Line Card is reset.

7. Type **3**, press SPACEBAR or (,), type *destination_name*, and press ENTER to assign the card destination name. Enter a valid destination name, created in Menu 2, to direct all call requests to the destination name on this card. See the screen below for an example.

```
                                                                    Menu 4
01 The baseport of the card to edit is-------------------------------------000
02+Configure as AI192/196 X.25 network card with slot expansion of--------1
03 The card's destination name is-----------------------------------AI
```

   This menu item is not available if the card type defined in Menu 4.2 is an AI183/185 card. Refer to Menu 4.2.2: Configure as AI183/185 standard 4/16 port card on page D-2 for specific information.

8. Type **4**, press SPACEBAR or (,), type *card's_description*, and press ENTER to enter a description of this port. Enter any alphanumeric string with a maximum character limit of 29. For example:

```
04 The card's description is----------------------x25ntwrkcrd
```

9. Enter **5** to toggle ON or OFF whether or not the Smart Line Card is included when (*) is used with the **stpslc**, **disabl**, and **enabl** commands.
   - ON includes this card, allowing it to stop, disable, or enable.
   - OFF excludes this card, leaving the card as is.

   Note: When you use these commands in their traditional manner, the setting of menu item 4.5 is ignored. Refer to the **stpslc**, **disabl**, and **enabl** commands for more information.

10. Enter **18** to setup Card initialization strings. Menu 4.18 appears.

```
                                                              Menu 4.18 pg 1
01
02
03
04
05
06
07
08
09
10
11
12
13
14

16 Previous page [,page]
17 Next page
18 Insert line
19 Delete line
20 Retain these changes for saving
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

11. Type *menu_line*, press SPACEBAR or (,), type *command*, and press ENTER. For example, type **1**, press SPACEBAR or (,), type **1 alrcr** and press ENTER to clear alarms when the chassis is restarted.

```
                                                              Menu 4.18 pg 1
01 alrclr
```

    See Chapter 8: Commands from the AI Prompt for information on the winslc commands, and the appropriate smart line card user's manual.

    You can enter up to 14 lines of commands on this page. If more lines are required, additional pages are available. You can toggle between the multiple pages and insert or delete lines using other selections on this menu.

    Each line can contain up to 76 characters. If more than 76 characters are needed to perform a single command, continue the command on another line by using a backtick (‘) as the last character of the line that you wish to continue.

12. Enter **16** to display the previous page of this menu. To view or change the strings on a specific page, enter the following command.

    16,*page*

13. Enter **17** to display or change the strings on the next page of this menu.

14. Type **18**, press SPACEBAR or (,), type *menu_line*, and press ENTER to insert a new line.

    For example, typing **18**,*9* will move down menu line 9 and the menu lines that follow. The new menu line 9 will be available to configure.

15. Type **19**, press SPACEBAR or (,), type *menu_line*, and press ENTER to delete a menu line. The lines following the deleted line will move up.

16. Retain these changes for saving in Menu 4, or exit without saving entries.

    - To save entries, enter **20**. This returns you to Menu 4.
    - To exit without saving entries, enter **21**. This returns you to Menu 4.

17. Save entries made in Menu 4, or exit without saving entries.

    - To save entries, enter **20**. This message appears:

    ```
    Please wait while the configuration is being saved...
    ```

    - This returns you to the Main Menu. This screen appears:
    - To exit without saving entries, enter **21**. This returns you to the Main Menu. Enter **21** to exit the menu system. The command prompt appears.

    ```
    AI198AISwitch craft port
    ```

Configuration for Menu 4 is complete.

Menu 5: Set or Remove Connection Restrictions Based on Port Numbers

Menu 5 restricts a specified port or group of ports from accessing one or more destinations. Menu 5 also restricts access to system configuration to a single location or to a group of locations.

To set or remove connection restrictions based on port numbers:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu

01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. Enter **5** to select `05+set or remove connection restrictions based on port numbers`. Menu 5 appears.

```
                                                                      Menu 5
01 The lowest port number to be affected by this restriction----------------***
02 The highest port number to be affected by this restriction---------------***
03 Restrict the ports from accessing this destination------------------********
.
.
19 Delete this restriction
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Type **1**, press SPACEBAR or (,), type *lowest_port_number*, and press ENTER to select the lowest port number to be affected by the restriction.

5. Type **2**, press SPACEBAR or (,), type *highest_port_number*, and press ENTER to select the highest port number to be affected by the restriction.
6. Type **3**, press SPACEBAR or (,), type *destination*, and press ENTER to deny destination access to the specified range of ports from menu item 5.1 to menu item 5.2.
7. Enter **19** to delete the restriction in menu item 5.3.
8. Save changes made to Menu 5, or exit without saving entries.
   - To save entries, enter **20**. The Main Menu appears.
   - To exit without saving entries, enter **21**. The Main Menu appears.
9. Enter **21** to exit the menu system. The command prompt appears.

```
AI198AISwitch craft port
```

Configuration for Menu 5 is complete.

Menu 6: Display all Connection Restrictions Based on Port Numbers

Menu 6 lists all the restrictions configured in Menu 5.

To view all restrictions:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. From the Main Menu, enter **6** to select `06+Display all connection restrictions.` Menu 6 appears.

```
                                                                    Menu 6
01 The following restrictions have been defined

Pll Phh Name     Pll Phh Name     Pll Phh Name     Pll Phh Name
000-015 AI
.
.
<CR> Show more restrictions
21 Return to Main Menu
Enter item number and optional ",value" then push <CR> key
```

These fields display:

Pll	Lowest port number affected by the restriction.
Phh	Highest port number affected by the restriction. If the restriction is for a single port, this number will be identical to `Pll`.
Name	Destination name restricted from the port range shown.

4. Press ENTER to continue the display if restrictions appear on more than one screen.
5. Enter **21** to exit the display. The Main Menu appears.
6. Enter **21** to exit the menu system. The command prompt appears.

```
AI198AISwitch craft port
```

Configuration for Menu 6 is complete.

Menu 7: Configure Slot Density

The slot density setting determines how many of the available TDSs are assigned to the slots in each chassis. (This is a chassis-by-chassis, not a slot-by-slot, setting.) A TDS represents a single data path between one card and another (or itself). The number of TDSs assigned to a slot determines the number of independent data paths (that is, connections) available to a card plugged into that slot.

Asynchronous interface cards do not benefit from having more TDSNs assigned to their slot than the number of asynchronous ports that exist on the card (4 on the AI183 and 16 on the AI185). However, interface cards can in general support more Virtual Circuits (VCs) if more TDSNs are assigned to their slot.

Smart Line Cards which support VC multiplexing offer additional configuration flexibility. They can be used in chassis with a small slot density setting (for example, four TDSs/slot) and still support a large number of VCs by multiplexing the connections over just one TDS. In such an application, a small density setting can be used. However, in order to obtain a greater bandwidth, TDSs can be aggregated. Such an application would require a higher density setting.

To view all restrictions:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. From the Main Menu, enter **7** to select `07+Configure slot density`. Menu 7 appears.

```
                                                                        Menu 7
01 Slot density (number of TDSNs per slot) for CPU box------(TDSNs 000-127)--16
02 Slot density for first expander box----------------------(TDSNs 128-255)--16
03 Slot density for second expander box---------------------------------DISABLED
04 Slot density for third expander box----------------------------------DISABLED
05 Slot density for fourth expander box---------------------------------DISABLED
06 Slot density for fifth expander box----------------------------------DISABLED
07 Slot density for sixth expander box----------------------------------DISABLED
08 Slot density for seventh expander box--------------------------------DISABLED
.
*****************************************************************************
 *  The contents of this menu may only be saved if no Smart Line Cards are   *
 *  configured.                                                              *
 *  WARNING: Saving from this menu will cause the entire AISwitch to reset.  *
 *****************************************************************************
.
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Type **1**, press SPACEBAR or (,), type *slot_density*, and press ENTER to assign the `slot density for the CPU box`. Slot density is the number of TDSNs per slot. The default is 16.

5. Type *menu_item* (2 through 8), press SPACEBAR or (,), type *slot_density*, and press ENTER to set the slot density for additional ports. The default is `DISABLED`.

   For example, type **2**, press SPACEBAR or (,), type **16**, and press ENTER to assign a slot density of 16 for the first expander box. Refer to this screen.

```
                                                                        Menu 7
01 Slot density (number of TDSNs per slot) for CPU box------(TDSNs 000-127)--16
02 Slot density for first expander box----------------------(TDSNs 128-255)--16
```

6. Save changes made to Menu 7, or exit without saving entries.
   - To save entries, enter **20**. This will reset the AIswitch.
   - To exit without saving entries, enter **21**. The Main Menu appears.

7. Enter **21** to exit the menu system. The command prompt appears.

```
AI198AISwitch craft port
```

Configuration for Menu 7 is complete.

Menu 8: Configure the Alias Translation Table

Menu 8 is used to configure call routing alias translations and multiplexed connections.

Alias Translations

These alias translations can be configured:

- Simple alias translation
- SLC routing translation
- Multiplexed-only translation

Each alias type has its own properties. Understanding the alias types is essential for effectively configuring AI180 call routing. See Macro Facts on page C-2 for an explanation of alias translations.

Another feature of aliases is alternate routing. This allows the AI180 to reroute failed calls along different paths, adding robust fault tolerance. See Macro Facts on page C-2.

Multiplexed Connections

Multiplexed connections are also configured at this menu. This is not an actual alias used to route incoming calls. Instead, it is used by the CLC to generate transactions to the interface card.

When an interface card is booted, the table of aliases is searched for multiplexed connection type aliases with the same destination as the interface card baseport. If any are found, the call data string is sent to the interface card. The interface card later uses this string as the call user data in a multiplex establishment call.

See Chapter 7: Call Routing for details on these connections.

Menu 9: Display the List of Alias Translation Entries

Menu 9 lists the alias translations currently maintained within the system.

To display the list of alias translations:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
 >menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. From the Main Menu, enter **9** to select `09+Display the list of alias translation entries`. Menu 9 appears.

```
                                                                    Menu 9
01 The following alias translation entries have been defined

Alias                   Dest.           Vis. Trans.   Calling String
                                             Type
SETHERCALL              ETHER160     Y       1   198.30.207.35#1
X25CALL                 XDOT96       Y       1
X25CALL2                XDOT32       Y       1
XIRB1                   192.0.2+     Y       8
XIRB2                   192.0.2+     Y       8
BGX                     XDOT96       N       1
BGIP                    ETHER160     N       1   198.30.207.35#400
LOOP                                 N       8   X25.13.9999
198.30.207.33#1000      AI           Y       1
XIRBCALL                XDOT96       Y       1   12345
IEGBCALL                ETHER160     Y       1   172.16.30.207#5001
TEST                                 Y       1
TEST2                                Y       1
TEST3                                Y       1

<CR> Show more alias translation entries
21 Return to Main Menu
Enter item number and optional ",value" then push >
```

Strings which are too long for the display will be truncated and have a plus sign (+) as the last character.

This information appears:

Alias — The alias name defined in menu item 8.1.

Dest. — The destination as defined in menu item 8.3.

Vis. — Indicates whether this alias is visible in the destination menu. Valid values are:
Y - Yes
N - No

Trans. Type — The alias translation type as entered in menu item 8.2:
1 – Simple alias translation
6 – Multiplexed connection
7 – Multiplexed only connection
8 – SLC routing translation

4. Press ENTER to continue the display of alias translations.

5. Enter **21** to exit the menu system. The command prompt appears.

```
AI198AISwitch craft port
```

Configuration for Menu 9 is complete.

Menu 10: Configuring the BOOTP Table

Menu 10 is used to configure a table of 20 BOOTP entries.

Note: Do not configure the entry for any AI2524 or AI294 if the card configuration is stored in menu 4.18 of the same CLC. Otherwise, the card will fail to get its configuration from the CLC.

To configure the BOOTP table, do the following:

1. Log onto the AI198.
2. At the command prompt (>), enter **menu**. The Main Menu appears.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
10+Configure the BOOTP table









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
>
```

3. Type **10** and press ENTER. The first 10 BOOTP entries of Menu 10 appear.

```
>10
                                                                        Menu 10
    Client MAC         Client IP        TFTP Server IP   Router IP
02+
03+
04+
05+
06+
07+
08+
09+
10+
11+




17 Display first page
18 Next page
19 Delete entry
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
>
```

4. Select **18** for an additional 10 BOOTP entries on the next page.

5. To view or edit the data fields for any BOOTP entry, select a menu item between **02** and **11** and press ENTER. Menu 10.1 appears.

```
>2
                                                                      Menu 10.1
01 Client MAC Address (xx:xx:xx:xx:xx:xx)--------------------00:00:00:00:00:00
02 Client IP Address-----------------------------------------000.000.000.000
03 TFTP Server IP Address------------------------------------000.000.000.000
04 Router IP Address-----------------------------------------000.000.000.000
05 Subnet Mask-----------------------------------------------000.000.000.000
06 Server Hostname-------------------------------------------------------------
07 TFTP Filename---------------------------------------------------------------









20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
>
```

6. For menu item `01 MAC Address`, type the MAC address of the AI296 and press ENTER. The default is `00:00:00:00:00:00`, which must be replaced with a valid, unique MAC address.

   Note: If you do not enter a unique MAC address, a **Duplicated MAC Address** error message will display.

7. For menu item `02 Client IP Address`, type the Client IP address and press ENTER. The default is `000.000.000.000`, which must be replaced with a valid IP address.
8. For menu item `03 TFTP Server IP Address`, type the server IP address and press ENTER. The default is `000.000.000.000`, which must be replaced with a valid IP address.
9. For menu item `04 Router IP Address`, type the router IP address and press ENTER. The default is `000.000.000.000`, which must be replaced with a valid IP address.
10. For menu item `05 IP Subnet Mask`, type the subnet mask and press ENTER. The default is `255.255.255.254`.
11. For menu item `05 Server Host Name`, type the server host name and press ENTER. The maximum length is 60 characters.
12. For menu item `07 TFTP Filename`, type the TFTP Filename and press ENTER. The maximum length is 60 characters.
13. Save entries made to menu 10.1 or exit without saving entries.
14. To save entries, type **`20`** and press ENTER. This returns you to the Main Menu.
15. To exit menu without saving entries, type **`21`**. Changes you made will revert to the previously configured values.

Configuration for Menu 10 is complete.

Configuration by SNMP

This chapter describes how the AI198 supports configuration through SNMP software.

Guide to this Chapter

SNMP and AppliedView

SNMP

SNMP, a request-reply protocol between an SNMP manager and an SNMP agent (network element), is an industry standard protocol for managing network elements. A Management Information Base (MIB) defines the data maintained by the agent for the manager to query or set. SNMP requires a method of transporting IP traffic between the manager and each of the agents.

The SNMP agent on the AI198 allows management and monitoring of the AI180 using network manager software.

AppliedView

If you choose to use SNMP to configure and manage the AI180, AI recommends that you use the AppliedView manager software, which includes a GUI and has been optimized for use with the AI180 and related products.

For specific SNMP and AppliedView information, refer to the *AppliedView AI Product Element Management System Installation and Administration.*

Alarm Monitoring

SNMP and AppliedView also support alarm monitoring. Options on both the AI198 and AppliedView allow the alarm reporting mechanism to be configured for the needs of the network manager.

Configuring with SNMP and AppliedView

Configuring Smart Line Cards

Smart line card configuration varies among card types. Refer to the appropriate smart line card document and the *AppliedView AI Product Element Management System Installation and Administration* for specific configuration instructions.

Configuring the AI198

If you are configuring the AI198 by SNMP using AppliedView, refer to the *AppliedView AI Product Element Management System Installation and Administration*.

If you are configuring the AI198 by SNMP with software other than AppliedView, refer to that vendor's instruction manual.

SNMP Trap Table Support for Independent Smart Line Cards

The SNMP trap table resides on the AI198. It will be sent to independent smart line cards, such as the AI196-I, whenever the AI198 starts up or after the trap table has been reconfigured. This allows SNMP managers, such as AppliedView, to configure an AI trap table centrally and have that configuration be distributed as necessary.

The information will be sent by a timer function initialized to run approximately 15 seconds after a configuration change to the trap table. Upon startup, the trap table information is sent immediately.

Altering Default Community Names using SNMP

Two objects in the AI198 proprietary MIB are used for storing community names for security purposes:

- aiCLCReadCommunity
- aiCLCWriteCommunity.

The Write community string (aiCLCWriteCommunity) provides the user with read and write access to all proprietary MIB objects, while the Read community string (aiCLCReadCommunity) provides read-only access to MIB objects. These objects should not be given the same name.

In most instances, it is necessary to change these read and write values to provide the highest level of security provided by SNMP. In the AppliedView application, you can change these objects via the Configure AIswitch dialog under the topic SNMP Agent.

Refer to the *AppliedView AI Product Element Management System Installation and Administration* for more information about changing community names.

SNMP and the AI2524

Card Table

The SNMP support required for the AI2524 consists of managing the card by using the card table (aiCLCCardTable) in the AI198 proprietary MIB.

The AI2524 status is monitored using the (aiCLCCTAdminStatus) object. The AI2524 can be reset but not disabled. If you set the admin status to up, the card will reset. After you reset the card, it automatically changes its admin status to up. Setting the admin status to down for this card has no effect.

The MIB object (aiCLCCTCardType) has the value ai2524(7) to represent the AI2524. If you set this MIB object to the value ai2524(7), you configure the specified slot for an AI2524. It is not necessary to disable the card when changing the card type from an AI2524 to any other card.

Slot expansion for this card is 1. The baseport for this card represents the slot in which the card resides. The highport is equal to the baseport plus one slot worth of ports -1.

The read and write community strings that appear in the card table are read only for the AI2524. The community strings displayed are the first read and first read-write community string discovered in the AI2524 configuration. To change community strings, you must make the necessary changes in the AI2524 configuration.

The SNMP state is snmpDirect. This indicates that any SNMP management occurs directly on the AI2524. The IP address and subnet mask of the AI2524 reside in the card table. The router IP address is identical to the IP address.

The MIB object (aiCLCCardSysOID) resides at end of the card table. This MIB object contains the system OID for a card. This field can be used to differentiate between subtypes of cards (that is, AI193-TX and AI193-ES) as well as provide a quick view to any SNMP manager reading the card table.

Auto ID Table

The MIB table (aiCLCAutoIDTable) resides in the AI198 proprietary MIB. This table contains board identification information such as product name, serial number, date of manufacture, and MAC address. This table provides a card level inventory of all cards that contain an Auto ID device and can be accessed using the Auto ID bus. This table is entirely read-only.

Link Status Table

The AI2524 link status table (aiCLCAI2524 LinkTable) contains the 10BaseT noncabled side link status for the AI2524. This table contains an entry for each AI2524 in an AI180. Each entry contains the baseport for the AI2524 and the 10BaseT link status. This table is indexed by baseport.

SNMP and the AI294

The SNMP support required for the AI294 consists of managing the card by using the card table (aiCLCCardTable) in the AI198 proprietary MIB.

The AI294 status is monitored using the (aiCLCCTAdminStatus) object. The admin status for the AI294 reflects the state of the AI294 board status signal. The AI294 can be reset but not disabled. If you set the admin status to up, the card will reset. After you reset the card, it automatically changes its admin status to up.

The MIB object (aiCLCCTCardType) has the value ai294(8) to represent the AI294. If you set this MIB object to the value ai294(8), you configure the specified slot for an AI294. It is not necessary to disable the card when changing the card type from an AI294 to any other card.

Slot expansion for this card is 1. The baseport for this card represents the slot in which the card resides. The highport is equal to the baseport plus one slot worth of ports minus1.

The read and write community strings that appear in the card table are read-only for the AI294. The community strings displayed are the first read and first read-write community string discovered in the AI294 configuration. To change community strings, you must make the necessary changes in the AI294 configuration.

The SNMP state is snmpDirect. This indicates that any SNMP management occurs directly on the AI294. The IP address and subnet mask of the AI294 reside in the card table. All of the IP address information is read only for the AI294.

AI198 MIB

A MIB defines a collection of standard and proprietary objects. Each MIB definition uses a standard notation, called the Structure of Management Information, to specify objects.

To access the value of a MIB object, an SNMP manager sends a GetRequest to the agent specifying the desired instance of the object. The request message contains an object identifier. The agent's corresponding response message carries the same identifying information.

SNMP Traps

An SNMP trap is an asynchronous SNMP message usually sent automatically from an SNMP agent to an SNMP manager, indicating that a specific event or error has occurred. The AI198 has the potential to send many types of trap messages to an SNMP manager.

SNMP Trap Support for Asynchronous Ports

The AI198 reports changes in asynchronous port status via asynchronous link up and link down traps. These proprietary traps, issued on a per-port basis, are issued upon reboot of the AI198 and under these conditions:

Table 5-1 Trap Conditions

Asynchronous Link Up Trap	**Asynchronous Link Down Trap**
Port State changes from Disabled to Enabled.	Port State changes from Enabled to Disabled.
Port Status changes from anyStatusButConnected to Connected.	Port Status changes from Connected to anyOtherStatus.
DSR Signal changes from inactive to active.	DSR Signal changes from active to inactive.

The traps always include all three conditions as varbinds in the trap. A manager can expect at least one trap per asynchronous port within a minute of startup.

For backward compatibility with AppliedView, these traps are disabled. You can enable the traps by using the SNMP MIB object aiCLCAsyncTrap located in the System family of the AI198 proprietary MIB.

This method of reporting asynchronous port status uses less CPU time, and fewer resources in both the management station and the CLC, than continuous polling of the SNMP manager (the method used in previous releases).

Downloading Software and Configurations

This chapter describes how to download and save software updates and configurations to and from the AI198.

The download feature provides the ability to obtain software and configuration images from an external source. This allows you to:

- Update the internal software of download-capable cards
- Store and reload configuration information.

Updates, corrections, and enhancements can be delivered on a floppy disk instead of in firmware on an IC chip. In most cases, you can install software with a few keyboard commands instead of having a hardware specialist come to upgrade the software.

The download feature also lets you store and reload configuration information via floppy disk or network or transfer it between separate networks.

Since the CLC controls the download process, a download-capable CLC such as the AI198 is a primary requirement. Depending on your connectivity, you can load files from a floppy diskette on a personal computer or your local network. This can be accomplished using an asynchronous connection or the AI198 built-in FTP capability.

Guide to this Chapter

Check the Current Software Versions

Use these commands to check the current version number of the software which resides in your card.

show version

This command shows the software version being used on a specific smart line card. The specific output of this report depends on the type of smart line card being checked, although the pertinent version number, boot loader version, and software checksum information should be present.

Format

winslc *baseport* **show version**

Parameters

baseport	Baseport number of the card being checked.

status

This command displays information about the CLC software currently running. Typing this command produces this report displaying the boot EEPROM, checksum, and the software version information.

Example Report

```
AISwitch status
Welcome To AISwitch
13:49:03 031901 Last restart 13:48 03/19
0 Connects active, 0 Connects on Hold
0 Ports present
0 Ports in wait queue
0 EEProm faults
73089 Bytes EEProm free
3431 Buffers created
3420 Buffers free
0 Inter-CPU xactions
0 SLC window xactions
0 Scan max, Scan min 2147483647
0 Connections placed
0 Buffer alloc failures, 0 Buffer realignments, 0 TXTAIL misses
33A08864 Boot EEPROM checksum
33A08864 Current EEPROM checksum
Software version 98CLC180.001833 (02/22/01 08:48:45) /DEB/180/DUAL/WTX
Spurious Interrupt occured 0 times.  Most recent address was 0x00000000.
Executing from FLASH EEPROM
Backup CLC absent.
The current alarm level is 7
```

update

This command provides a list of the software versions in all the FLASH and BootROM EPROM banks of the active and backup CLCs.

A list for all images in the CLC then follows.

```
Listing of code stored in the CLCs.
===================================

Active CLC's primary bank: 98CLC180.001833
Name: 98clc180.img
Comments:
AI198 Version 180. This is PRE-RELEASE code.

Active CLC's secondary bank: 98CLC180.001833
Name: 98clc180.img
Comments:
AI198 Version 180. This is PRE-RELEASE code.

Active CLC's BootROM: 98BLD100.000038
Name: 198boot.all
Comments:
This is the standard AI198 boot loader.

Backup CLC not Present.
```

In this example, the current CLC software version is shown as 98CLC180.001833. The BootROM version is 98BLD100.000038. The example also shows a Smart Line Card software image stored in the secondary bank: 98CLC180.001833. There is no backup CLC present in this example.

Download the New Software

You must download new software into a storage bank on the active CLC regardless of whether the software is used on the CLC itself or a smart line card. Once downloaded, the stored image is checked for validity but is otherwise dormant until further actions are taken. The image remains in storage until overwritten by the next software download.

During this phase of the download process, all cards continue to process calls and perform other system maintenance as usual.

Note: When you upgrade cards so that you have an AI192/6-X Version 7.20 or higher and the AI198 Version 1.30 or higher software, you must use the "AI192/196I with full menu support" menu (Menu 4.3.12 in Versions 1.30 and 1.31, Menu 4.2.12 in 1.40 or higher) to configure the AI192/6-X. You will not be able to use the "AI192/196I X.25" menu (Menu 4.3.4 in Versions 1.30 and 1.31, Menu 4.2.4 in 1.40 and higher).

There are two methods available for downloading files:

- Asynchronous File Transfer Method
- FTP Method

Asynchronous File Transfer Method

Asynchronous file transfer can be accomplished from a host computer with a local or remote (via modem) connection.

Requirements

This method requires:

- A host computer with terminal emulation software for one of these protocols:

  Xmodem

  Xmodem/1 kilobyte

  Ymodem

  Ymodem Batch

  Zmodem

- An asynchronous path from the host computer to the CLC via:

  Dumb asynchronous port

  Background connection

  Craft port

  (Asynchronous transfer via Telnet is not supported.)

- Matching configurations on the terminal emulator and the AI connection port.
- A valid AI product software file, obtained from a floppy disk or over the network.

Procedure

To download software via asynchronous transfer:

1. Log onto the AI180.

   Refer to Accessing the AI180 on page 3-6 for more information on connecting and logging in.

2. Once you have reached the command prompt using your asynchronous connection, enter this command.

   dwnld/*protocol*

   protocol is one of the following codes depending on which method your terminal emulation program uses:

   X is used for Xmodem or Xmodem/1 kilobyte.

   Y is used for Ymodem or Ymodem Batch.

   Z is used for Zmodem. (When using Zmodem across an X.25 network, use XON/XOFF.)

   The **dwnld** command prepares the CLC to receive a file from your host computer. The **dwnld** command accepts data from almost any terminal emulation program that has protocol upload and download features. Generally, Zmodem provides the quickest download. However, if the delay in the network is long, it is best to select a protocol like Xmodem, which requires individual packet acknowledgment. Xmodem is recommended for use with X.25.

3. Initiate an upload protocol on your terminal emulation program. Some programs display the Zmodem upload menu automatically. Check your terminal emulator instruction manual for specific details.

4. Select the software image file to be downloaded and begin the transfer. The target file must be a valid AI product software image (binary format) identified with an .img filename extension.

   If the CLC does not receive data within 1 or 2 minutes of the **dwnld** command, the command will time out and you must restart at step 2.

   To abort a transfer in progress, access the CLC from another connection and interrupt the process with this command:

   dwnld/a

   Otherwise, once the file has been successfully transferred, it is checked for validity. If valid, the file will be available for activation on the CLC or for upload to a smart line card. This type of log message appears when the transfer is complete:

```
>dwnld/z
**B0100000027fed4
|
Download successful.
BOX2BAS4 AISwitch craft port
```

FTP Method

FTP is a widely recognized standard for file exchange. Software to utilize FTP is readily available for nearly any type of computer system. It is used to mediate the transfer of files from one computer to another across a LAN or WAN.

Using FTP and the right connectivity, your CLC storage bank is recognized as a valid point for network file transfer.

Requirements

This method requires:

- A host computer running FTP client software.
- CLC IP parameters configured on the AI198.
- An IP network path from the host computer to the CLC.
- A valid AI product software file obtained from a floppy disk or over the network. Valid software files have an .img extension.
- Familiarity with the specific FTP software you are using on your host computer. Some of the FTP commands and procedures outlined here may be different for your specific FTP client package.

Procedure

To download software via FTP:

1. Run FTP on your host computer.
2. Make an FTP connection from the host computer to the active CLC. Use the AI198 IP address as a destination site.

   Only one FTP session is allowed on the CLC at any one time. Other FTP attempts will be refused.
3. Via the FTP connection, the CLC will request a login. At the `User` prompt, type *`ai`*.

Note: If user accounts have been created on the AIswitch, you must use a supervisor or manager login name and password, or you must have **`ftplogin`** permission in your profile. The *`ai`* destination name will not work unless you add *`ai`* as a new user account.

4. If your login requires a password, the `Password` prompt appears.

   This is not the destination password but the shell-override password entered in menu item 2.14 during system configuration.

   Note: If user accounts have been created on the AIswitch, you must use a supervisor or manager login name and password, or you must have **`ftplogin`** permission in your profile. The shell-override password will not work.

5. Once you are logged in to the CLC, issue FTP commands to obtain information from the AI198 FTP server and to transfer files.

   Although many FTP programs use similar commands, the exact commands and their use may vary depending on your client software. The **`dir`**, **`ls`**, **`get`**, **`put`**, and **`help`** commands are particularly helpful. See your FTP client document for specific supported commands.

6. File transfer must occur in binary mode. Use your FTP software commands to set your transfer protocol most likely to the binary or image protocol.

7. Issue FTP commands to initiate the download process. Enter the following:

   `put` *`filename`*

   `filename` is a valid AI product software image (binary format) identified with an .img file name extension.

Results

Once the file has been successfully transferred, the system checks it for validity. If valid, the file will be stored and made available for activation on the CLC or for upload to a smart line card.

The transferred files can be listed using the **`dir`** or **`ls`** FTP commands. The newly downloaded file is stored in the active secondary flash bank and is named **`as.img`** regardless of the original file name on the host system.

Other files that exist on the CLC are:

- **`Ap.img`** – the active primary software image
- **`Active.ee`** – the current configuration image

Activate a CLC Software Image

Active CLC

Once a valid CLC software image has been downloaded into the active secondary storage bank, it is dormant until activated for use. At the command prompt, enter the following command to place the image into primary storage on the active CLC:

update as ap

If no valid CLC image is found in the active CLC secondary storage bank, this message is logged, and the command aborts:

```
>update as ap

Copy from ACTIVE CLC's secondary to ACTIVE CLC's primary.

Cannot copy, secondary flash doesn't contain CLC code.
NODE-XXX AISwitch craft port
```

If a valid CLC software image is located, the command copies it into primary memory on the active CLC. Here is a sample log:

```
>update as ap

Copy from ACTIVE CLC's secondary to ACTIVE CLC's primary.

Starting copy to FLASH.
00731000
```

The memory index at the bottom of the message will increment to display progress.

Backup CLC

In a system utilizing a redundant CLC, the software image should also be copied from the active CLC to the backup CLC. This requires two steps:

1. Enter the following:

   update as bs

   Progress of this command is shown in the same fashion as for the active CLC.

2. Enter the following:

   update bs bp

   Progress for this command is not reported.

Refer to Chapter 8: Commands from the AI Prompt for more options under the update command.

Resetting the AI180

To activate the newly loaded software image in the CLC, it is necessary to restart the AI180.

CAUTION: All call processing will stop and all connections will be lost during the reboot process.

1. Enter the following:

   `reset`

2. The CLC requests confirmation of the reset by displaying this prompt:

   ```
   Are you sure you want to proceed? (Y/N) >
   ```

3. Type **`y`** if you want to continue with the **`reset`** command, or **`n`** if you want to abort. If you type **`y`**, the following message appears to confirm that a reset is in progress:

   ```
   RESET has been issued.  No commands will be accepted.
   ```

4. The CLC will reboot and come back online using the new software.

If this process fails, the AI180 may not be remotely accessible. This could require a call to Technical Support.

Upload Software into a Target Smart Line Card

Once a smart line card software image has been successfully downloaded into a storage bank on the CLC, it can be transferred to the appropriate smart line cards via the TDM backplane window. This can be accomplished in two ways:

- The winslc update command uploads software to one specified smart line card.
- The update/s command on the CLC performs a system-wide upload to all appropriate smart line cards at once.

CAUTION: When successful, both of these commands cause the target smart line cards to clear their calls and go offline while the valid software is uploaded.

CAUTION: If an FTP file transfer to the CLC interrupts an update at a critical stage, the image in the smart line card could be invalid.

winslc update

This command initiates a software upload from the CLC to a single target smart line card. The **winslc update** command is not part of the AI198 but resides on any download-capable smart line card. Check your specific smart line card manual to be sure this command is supported.

This command checks that a valid software image is loaded into the CLC storage bank. The software must be explicitly compatible with the targeted smart line card. Software which works on one kind of smart line card may not work on another. If no software image is found in the CLC, or if the software is incompatible with the smart line card, this error message appears and the command fails:

```
NODE-XXX 01:03:34 112800 Sev=F Base=032 Msg:
Download unable to proceed... CLC does not contain proper image
```

If a valid image for the target smart line card is found, the affected smart line card will be cleared of calls and marked offline. A crash report will then be generated (this is normal), and the software transfer will begin.

Format

winslc *baseport* **update [quiet]**

Parameters

baseport	This argument is the baseport of the target smart line card.

[quiet] This disables logging of progress and error messages. If you use this command, the system will not display the results of the command.

Example Report

```
>winslc 32 update
NODE-XXX AISwitch craft port
>@NODE-XXX 03:00:06 120400 Sev=2 Base=032 Msg:
Valid image has been found... Download in progress
@NODE-XXX 03:00:06 120400 Sev=4 Base=032 Msg:
Network marked OFF-line
@NODE-XXX 03:00:07 120400 Sev=7 Base=032 Msg:
** SLC has crashed (Fault info follows)
CRASH PC=00000000, CRASH PSW=0000, CRASH ERROR=0005
A0-A7
00100000 00000000 00000000 000024B4 00002900 0000299A 000C0000 00080000
D0-D7
00010000 00010000 00010000 00010000 00010000 00010000 00010000 00010000
@NODE-XXX 21:07:57 122700 Sev=F Base=032 Msg:
SLC Reports ready for transactions
```

The length of time for the file transfer depends on the size of the file being uploaded and the rate of data transfer between your CLC and smart line card. If you wish to check on the progress of the upload, use the **lists** command. The final line of the report shows how much data remains before transfer is complete.

Example Report

```
NODE-XXX AISwitch craft port
>lists

Queued ports:
no ports
Ports entering routing information:
no ports
Ports with alternate alias:
no ports
Ports receiving software download:
Port    Offset  Remaining
32      367360  118244
```

Once the smart line card receives and checks the software image for validity, the previous image is replaced by the new image, the card automatically reboots, and the card comes back online. The software is checked for validity after each boot.

```
NODE-XXX AISwitch craft port
>@NODE-XXX 03:00:47 120400 Sev=2 Base=032 Msg:
Previous SLC image being erased from flash.
@NODE-XXX 03:01:06 120400 Sev=2 Base=032 Msg:
New SLC image being programmed into flash.
@NODE-XXX 03:01:35 120400 Sev=1 Base=Active CLC Msg:
SLC booted on base port 032
@NODE-XXX 03:01:37 120400 Sev=F Base=032 Msg:
SLC Reports ready for transactions
```

If subsequent uses of the **lists** command show no progress with the upload, or if the process must be aborted, use the **stpslc** and **disabl/c** commands to stop the card and the **enabl/c** command to restart it. Refer to Chapter 8: Commands from the AI Prompt for details.

CAUTION: If the upload process is interrupted at a critical stage, the image in the smart line card could be invalid.

Under these conditions, the smart line card automatically attempts another upload when it reboots. If the smart line card is unable to obtain a valid software image from the active CLC, it will enter a wait condition. To resolve this, make sure that a compatible smart line card software image is stored on the CLC and then reset the troubled smart line card.

If the smart line card is not able to upload a valid software image and come online, see the command update on page 8-121 for advanced correction techniques.

update/s

This command updates all the appropriate smart line cards at the same time. You can execute this command from the command prompt on the CLC.

This performs a system-wide **winslc update quiet** command. The CLC initiates an upload to all connected smart line cards which are compatible with the software image stored in the active CLCs secondary bank.

The **update/s** command reports progress or errors only for smart line cards that are compatible with the software image being updated. Use the **lists** command to monitor progress and to confirm that the appropriate target smart line cards are receiving an upload.

CAUTION: The AI196-I hardware can run both AI196 X.25 and AI196 XIRB software. If an AI180 chassis contains AI196-I hardware running both types of software, do not use this command to update the smart line card software. Instead, use winslc update on page 6-11 to update individual smart line cards.

Downloading and Uploading Configurations

This section describes how to create backups of your AI180 configuration, restore them when necessary, or load them onto a different AI180. There are three methods for creating and restoring backup files:

- Symbolic Format Using dmpcfg
- Compressed ASCII Hexadecimal Format Using DMPEE
- Binary Configuration Image Via FTP

IP information entered through Network Parameters on page 4-21 is not affected when restoring backup configurations. Each CLC maintains unique values for these network items. Excluding these items from the configuration download prevents them from being overwritten:

- IP address
- IP subnet mask
- IP default router

Symbolic Format Using dmpcfg

In the symbolic format approach, the system configuration is listed to the connected port in text format and later restored.

CAUTION: This method does not save all SNMP information. If you are using SNMP to manage the AI180, refer to Binary Configuration Image Via FTP on page 6-16 for generating a binary image using the FTP method. The user account database and AI196-I configuration information are also not available via the **`dmpcfg`** command.

Creating the Backup

Enter the **`dmpcfg`** command to list the system configuration.

This generates a list of the **`config`** commands that must be entered to reconfigure the present system.

If your terminal emulation software allows, the screen output can be captured and saved to a file on disk or on your network depending on your connectivity. The file can be viewed as a standard text file and can be edited and saved.

The user account database is not available via a **`dmpcfg`** command.

Restoring the Backup

To restore the configuration, use your terminal emulation program to upload the file that was previously generated with the **dmpcfg** command. When the text from the file is received at the AI command prompt, the **config** commands are processed as if they were entered by hand.

To avoid overrunning the CLC and to be sure that there is enough time to process the commands, use a line-oriented echo pacing setting in your terminal emulator software.

To activate the restored configuration, you must reset the AI180. Enter the **reset** command.

The system prompts you to type **y** for verification. If reset is confirmed, the system reboots using the restored configuration.

Compressed ASCII Hexadecimal Format Using DMPEE

This is similar to the symbolic method. A configuration listing is captured by your terminal emulation program and later restored by uploading it back to the AI command prompt. The main difference is that **restee** commands are generated instead of **config** commands. **restee** commands use compressed hexadecimal codes. Although this typically generates a more compact listing, the captured file should not be edited.

Creating the Backup

Enter the following to list the system configuration:

```
dmpee
```

If your terminal emulation software allows, the screen output can be captured and saved to a file on disk or on your network, depending on your connectivity.

Restoring the Backup

To restore the configuration, use your terminal emulation program to upload the file that was previously generated with the **dmpee** command. When the text from the file is received at the AI command prompt, the **restee** commands are processed automatically. However, to avoid overrunning the CLC and to be sure that the there is enough time to process the commands, use a line-oriented echo pacing setting in your terminal emulator software.

Once the configuration has been successfully restored, perform a reset to activate it. Enter the following:

```
reset
```

The system prompts you to type **y** for verification. If reset is confirmed, the system reboots using the restored configuration.

Binary Configuration Image Via FTP

This method saves all configuration information, including SNMP data, the user account database, and AI196-I configuration information.

Binary images are far more compact than ASCII files. They require less storage space and take less time to save or restore. However, binary files are not text-based, and cannot be viewed or altered.

Using FTP and the right connectivity, your CLC storage bank is recognized as a valid point for network file transfer.

Requirements

This method requires:

- A host computer running FTP client software.
- An IP network path from the host computer to the CLC.
- Familiarity with the specific FTP software you are using on your host computer. See your FTP software documentation and the list of supported FTP commands in Chapter 1: AI198 Overview.

Creating the Backup

To backup your system configuration:

1. Run FTP on your host computer.
2. Establish an FTP connection from the host computer to the active CLC. Use the AI198 IP address as a destination site.

   Note: Only one FTP session is allowed on the CLC at a time. Other FTP attempts will be refused.

3. Via the FTP connection, the CLC requests a login. At the `user` prompt, type ***ai***.
4. If your login requires a password, the `Password` prompt appears.

   This is not the destination password but the shell override password as entered in menu item 2.14 during system configuration.

5. Once you are logged in to the CLC, issue FTP commands to obtain information from the AI198 FTP server and to transfer files.

   Although many FTP programs use similar commands, the exact commands and their uses vary depending on your client software. The **`dir`**, **`ls`**, **`get`**, **`put`**, and **`help`** commands are particularly helpful. See your FTP client manual for specific supported commands.

6. File transfer must occur in binary mode. Use your FTP software commands to set your transfer protocol most likely to the binary or image protocol.

7. Enter the following to initiate the backup process:

   get *filename*

   filename is a valid AI configuration image (binary format).

   The file name Active.ee stores configurations. You can rename the file once you have saved it.

Restoring the Backup

To restore a backup:

1. Run FTP on your host computer.
2. Establish an FTP connection from the host computer to the active CLC. Use the AI198 IP address as a destination site.

   Note: Only one FTP session is allowed on the CLC at a time. Other FTP attempts will be refused.

3. Via the FTP connection, the CLC requests a login. At the `User` prompt, type *ai*.
4. If your login requires a password, the `Password` prompt appears. This is not the destination password but the shell override password as entered in menu item 2.14 during system configuration.
5. Once you are logged in to the CLC, issue FTP commands to obtain information from the AI198 FTP server and to transfer files.

   Although many FTP programs use similar commands, the exact commands and their uses vary depending on your client software. The **dir**, **ls**, **get**, **put**, and **help** commands are particularly helpful. See your FTP client manual for specific supported commands.

6. Enter the following to initiate the restoration process:

   put *filename*

   filename is a valid AI configuration image (binary format) with the .ee filename extension. The file may have been renamed or may retain the original Active.ee filename.

   Once the file has been successfully loaded into RAM, the system checks for validity. If valid, the file is transferred to EEPROMS and renamed to Active.ee regardless of the original filename. It is then ready for use.

   The presence of the transferred files can be seen using the FTP directory listing commands (most likely **dir** or **ls**). Other files that exist on the CLC are:

   as.img – the active secondary software image

   ap.img – the active primary software image

7. Enter the following to reset the AI180 to activate the restored configuration:

   `reset`

8. At the system prompt, type **`y`** for verification. If reset is confirmed, the system reboots using the restored configuration.

Call Routing

This chapter explains the various ways to route calls in an AIswitch.

Guide to this Chapter

Menu Descriptions

Routing Calls

There are two means to route calls in the AIswitch: the Time Division Subchannel bus (TDS) and the Inter-Repeater Interface Controller bus (IRB). Some cards in the AIswitch connect only to the TDS bus, and some connect only to the IRB. The AI193 connects to both. (See Figure 7-1.)

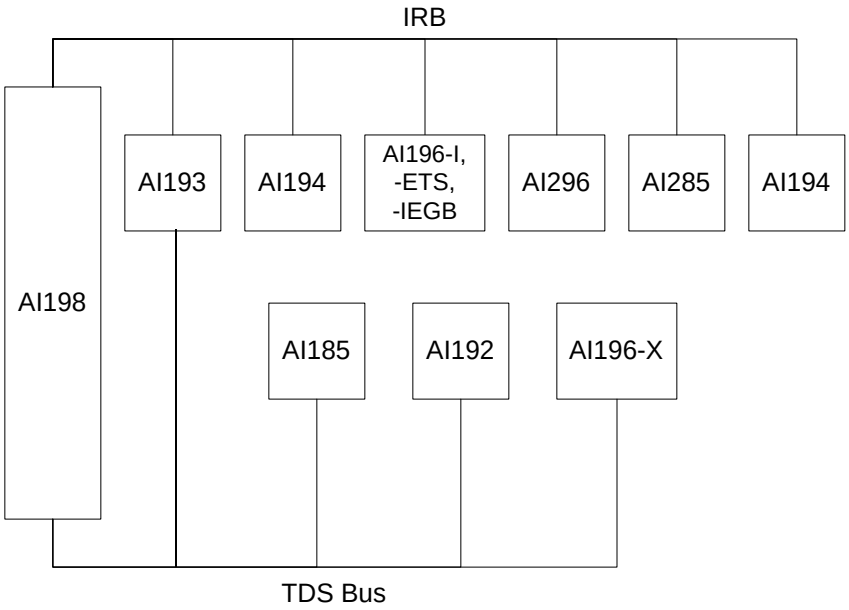

Figure 7-1 TDS Bus and IRB

Route Calls with Aliases

You route calls by specifying aliases for call routes. An alias is a name assigned to a specific call route, which is a logical backplane connection between two TDSs. When a call comes into the AIswitch, the switch looks for an alias with matching incoming-call information. If the switch finds a match, it sends the call to the destination specified in the alias. If a call comes into the AIswitch and does not find an alias with matching information, the switch rejects the call.

The AIswitch uses four types of aliases (Table 7-1). Three use the TDS bus and one uses the IRB.

Table 7-1 Types of AIswitch Aliases

Alias Type	Description	Bus Used
Simple alias translation	A call route that uses the TDS bus.	TDS bus
Multiplexed connection (MUX)	A call route between two cards in the AIswitch that acts as a bridge between them. Many different call routes can use a single MUX.	TDS bus
Multiplexed only translation	A call route that always uses a multiplexed connection.	TDS bus
SLC routing translation	A call route that uses the IRB.	IRB

Address Strings

This table (Table 7-2) shows the relationships between several of the strings in the CLC aliases.

Table 7-2 Relationships Between CLC Aliases

	Called Address	Caller's Address	Call Data	Alternate Route	Link Number
Input	A_in	B_in	C_in		
Alias	A_alias	B_alias	C_alias	ALT_alias	LINK_alias
Output	A_out	B_out	C_out	ALT_out	LINK_out

In general, when placing a call, the available input strings are passed to the CLC. (The input row shows which strings may be sent to the CLC from either a smart line card or a user port.) The CLC then checks for aliases and processes them into output strings. These output strings are used for placing the call.

Not all input strings are supplied by every card. The specific card and version being used determines which strings are available to be passed and what data is in those menu items.

As a result of processing the available input strings, the CLC must generate one of these, or the call fails:

- **a**_*out*
- **b**_*out*
- **c**_*out*

At least one of these is required for an incoming call. For outgoing calls, at least one of these is required unless the multiplex establish bit is set, or there is an alternate routing string.

Input strings originating at a user port are entered at the destination menu as:

c_*in*,**a**_*in*,**b**_*in*

At least one of the input strings is required to allow alias matching. Be certain to include commas as place holders if leading input strings are omitted. For example, this syntax excludes both **c**_*in* and **a**_*in*:

,,**b**_*in*

If the supplied input strings do not generate at least one of the **a**_*out*, **b**_*out*, or **c**_*out* strings, the system prompts you for further input at the DNA prompt (for X.25 calls) or the IP prompt (for TCP/IP calls). The input follows this format:

a_*out*,**c**_*out*@**link**_*out*,**b**_*out*

At least one of the **a**_*out*, **b**_*out*, or **c**_*out* strings is required.

The alias row shows the strings in the body of the alias that can contain macros.The output row shows the result of the evaluation of the alias row.

Name Matching

The CLC matches call setup strings typed by the user against destination and alias names in a specific order. Understanding this order is crucial when setting up alias macros with alternate routing. To better illustrate the name matching process, consider an AI198 with the following three destination names defined, all going to asynchronous ports:

- ASY48
- ASY51
- ASY112

In addition to these destination names, these three alias macros have been defined:

Table 7-3 Alias Macro Examples

Macro Name	Destination	Called Address	Alt_Alias
=L(C,3)='ABC'	ASY48	79	ALT_ALIAS5
=L(A,2)='79'	ASY51		
ALT_ALIAS?	ASY112		

The first macro tests to see if the first 3 leftmost characters of the call data (**c**_*in*) equals 'ABC.' If a user types 'ABC' as a destination name, this macro will be invoked and route the call to ASY48.

The second macro tests to see if the 2 leftmost characters of the called address (**a**_*in*) equals 79. If this macro is invoked, it will route the call to ASY51.

The last macro is intended to be used as an alternate routing macro by the first macro.

Alias Name Matching Process

This section describes the steps performed by the CLC when trying to route a call.

Step 1: Determine Search String

After receiving the input strings, the CLC determines which one to use for comparison to the destination and alias names.The CLC will look for the first non-blank input field by the order in which the aliases appear in the CLC. The result is then used as the search string for matching.

Step 2: Match Search String to all Destination Names

Next, each destination name is compared to the search string. If it matches, and the destination is not a smart line card, the call is placed. If the destination is a smart line card, and the caller is a user port, the user is prompted to enter the output strings. If the caller and destination are both smart line cards, the call fails. There is no mechanism to automatically generate output strings.

Step 3: Match Alias Names

If no destination name matches the search string, the alias names are searched. The comparisons for aliases allows MS-DOS style wildcards (* and ?) in the alias name for more flexibility. Here are a few examples.

Table 7-4 Alias Comparisons with MS-DOS Wildcards

Alias Name	Search String	Result
12.34.56.*	12.34.56.78	Match
XDOT?4	XDOT234	No Match
1234?6	123456	Match

In addition, the alias name can be a macro. Macros allow the alias to be matched against specific input. The macro is evaluated, and the result string is treated as an alias name. The final evaluation of a macro may also be a numeric value. If the macro result is a zero, the alias doesn't match. If the macro result is not zero, then it does match.

If a match is made, the macro evaluator processes each available alias string and produces the respective output strings. The call is then placed using the appropriate output strings. If no match is made with either the destinations or the aliases, the call fails. The reason given is Destination Unknown or Invalid Class.

Searching Alias Descriptions

You can search for an alias that has a specific string in Menu 8 by using the following command format:

s *number searched_key*

Table 7-5 describes the variables to use to search alias descriptions.

Table 7-5 Alias Search Variables

Variable	Description
s	Searches for an alias.
number	Is the field number you want to search. You can perform the search on the following field numbers in Menu 8: ● 1 Alias name ● 3 Destination ● 4 Called address ● 6 Link number ● 7 Caller's address ● 8 Call data ● 9 App. string ● 10 Called protocol ● 11 Caller's protocol ● 12 Alternate routing alias
searched_key	Is the string you search. Examples: ● **S3 XDOT32** - Search for an alias that has XDOT32 in the destination field. ● **s8 TEST*** - Search for an alias that has its CUD field begin with TEST.

If you begin a search from an empty alias (which is an alias menu without any input), the AI198 starts its search from the beginning of the alias list. If you begin a search from an existing alias, it starts the search from the next alias. The AI198 searches to the end of the alias list and displays the first alias that matched the searched key. The search can be continued until the AI198 finds no matched alias and displays an empty alias with a message END OF ALIAS LIST to signal the end of the list. From the empty alias, the search can be continued and started from the beginning of the list. The search is complete when the AI198 redisplays the first matched alias.

Alternate Routing

If an incoming call fails for any reason, but did match an alias that has an alternate routing string (ALT_alias), the CLC attempts to place the call again. This procedure works by retaining the original input strings **a**_*in* and **b**_*in* and replacing string **c**_*in* with string **alt**_*out*. These strings are then used as though a new call had come in.

In the case of alternate routing, each destination name is compared to **alt**_*out*, **a**_*in*, and **b**_*in* before the next destination name is checked. After the destinations are checked, the search continues with each alias. Refer to the examples later in this section to illustrate the difference between matching orders.

These alternate routes can be linked together to form chains up to 16 aliases long. Any chain exceeding 16 aliases in length will fail after the 16th attempt.

Example 1: Call Data Only, Successful Call

In this example, suppose the user types the string ABC. Since this was all they typed, the CLC will set **c**_*in* = ABC and match this against all destination names, in this order:

- ASY48 = ABC (no)
- ASY51 = ABC (no)
- ASY112 = ABC (no)

Since none of these matching tests succeeded, the alias names are checked next. The CLC now matches the search string (ABC) against all alias names, evaluating them if they are macros. The following tests are performed, in this order:

- ABC = ABC (yes - testing stops here)
- 79 = ABC
- ALT_ALIAS? = ABC

The testing stops at the first match, the first macro in this case (but notice the other tests that would have been performed). Since the match was successful, this macro destination (ASY48) is used, and the call is routed to ASY48. For now, assume that the call placed successfully. See Example 3: Call Data Only, Failed Call on page 7-11 for an illustration of how alternate routing would be used if this call failed.

Example 2: Call Data and Called Address, Successful Call

In this example, suppose the user types the string ABC,79 to specify a called address. The CLC will set **c**_*in* = ABC and **a**_*in* = 79. Since **c**_*in* is not blank, it is used as the search string just as before. This search string will be matched against all destination names, in this order:

- ASY48 = ABC (no)
- ASY51 = ABC (no)
- ASY112 = ABC (no)

Since none of these matching tests succeeded, the alias names are checked next. The CLC now matches the search string (ABC) against all alias names, evaluating them if they are macros. The following tests are performed, in this order:

- ABC = ABC (yes - testing stops here)
- 79 = ABC
- ALT_ALIAS? = ABC

The testing stops at the first match, the first macro in this case (but notice the other tests that would have been performed). Since the match was successful, this macro destination (ASY48) is used, and the call is routed to ASY48. For now, assume that the call placed successfully. See Example 4: Call Data and Called Address, Failed Call on page 7-12 for an illustration of how alternate routing would be used if this call failed.

Example 3: Call Data Only, Failed Call

This example illustrates how alternate routing is used when the call request shown in Example 1 fails to connect. To begin, the user types the string ABC. Since this was all they typed, the CLC will set **c**_*in* = ABC and match this against all destination names, in this order:

- ASY48 = ABC (no)
- ASY51 = ABC (no)
- ASY112 = ABC (no)

Since none of these matching tests succeeded, the alias names are checked next. The CLC now matches the search string (ABC) against all alias names, evaluating them if they are macros. The following tests are performed, in this order:

- ABC = ABC (yes - testing stops here)
- 79 = ABC
- ALT_ALIAS? = ABC

The testing stops at the first match, the first macro in this case (but notice the other tests that would have been performed). Since the match was successful, this macro destination (ASY48) is used, and it attempts to place the call to ASY48.

What if the call fails to connect? In this case, the first macro has alternate routing defined (ALT_ALIAS5), so the CLC sets the string **alt**_*out* to ALT_ALIAS5. Now the CLC matches each destination name against **alt**_*out*, **a**_*in*, and **b**_*in*, one destination name at a time, to find a match. The following tests are performed (remember, **a**_*in* and **b**_*in* are null in this example):

- ASY48 = ALT_ALIAS5 (no)
- ASY51 = ALT_ALIAS5 (no)
- ASY112 = ALT_ALIAS5 (no)

Finding no match, it continues matching each alias macro name against **alt**_*out*, *a_in*, and **b**_*in*, one alias name at a time:

- ABC = ALT_ALIAS5 (no)
- 79 = ALT_ALIAS5 (no)
- ALT_ALIAS? = ALT_ALIAS5 (yes - testing stops here)

Since the alternate routing macro is actually named ALT_ALIAS?, the ? matches the single character '5' and the macro is invoked. This alternate routing macro has ASY112 specified as its destination, so the call is routed to ASY112.

Example 4: Call Data and Called Address, Failed Call

So far, all of our call attempts and macros have worked exactly as expected:

- Destination ABC routes to ASY48
- If this connection fails, it routes to ASY112
- Destination ABC,79 routes to ASY48 as long as ASY48 is not busy.

Now, let's look at how the different name matching order during alternate routing can produce unexpected results. We would expect that if a connection to ABC,79 failed that it would be routed to ASY112, since that is the alternate routing destination defined in macro ABC. Let's step through this scenario and see what happens.

The user types the string ABC,79 to specify a called address. The CLC will set **c**_*in* = ABC and **a**_*in* = 79. Since **c**_*in* is not blank, it is used as the search string just as before. This search string will be matched against all destination names, in this order:

- ASY48 = ABC (no)
- ASY51 = ABC (no)
- ASY112 = ABC (no)

Since none of these matching tests succeeded, the alias names are checked next. The CLC now matches the search string (ABC) against all alias names, evaluating them if they are macros. The following tests are performed, in this order:

- ABC = ABC (yes - testing stops here)
- 79 = ABC
- ALT_ALIAS? = ABC

The testing stops at the first match, the first macro in this case (but notice the other tests that would have been performed). Since the match was successful, this macro destination (ASY48) is used, and it attempts to place the call to ASY48.

Now suppose ASY48 is busy, so the call fails. In this case, the first macro has an alternate routing alias defined (ALT_ALIAS5), so the CLC sets the string **alt**_*out* to ALT_ALIAS5. Now the CLC matches each destination name against **alt**_*out*, **a**_*in*, and **b**_*in*, one destination name at a time, to find a match. The following tests are performed (remember, **b**_*in* is null in this example):

- ASY48 = ALT_ALIAS5 (no)
- ASY48 = 79 (no)
- ASY51 = ALT_ALIAS5 (no)
- ASY51 = 79 (no)
- ASY112 = ALT_ALIAS5 (no)
- ASY112 = 79 (no)

Finding no match, it continues matching each alias macro name against **alt**_*out*, **a**_*in*, and **b**_*in*, one alias name at a time:

- ABC = ALT_ALIAS5 (no)
- ABC = 79 (no)
- 79 = ALT_ALIAS5 (no)
- 79 = 79 (yes - testing stops here)
- ALT_ALIAS? = ALT_ALIAS5
- ALT_ALIAS? = 79

The testing stops at the first match, the first macro in this case (but notice the other tests that would have been performed). Since the first match is macro 79, the call is routed to that macro destination, which is ASY51 in our example.

Notice that this is not the intended destination. Failed calls were meant to go to ASY112 using the ALT_ALIAS? alias. Be aware that the order in which the aliases were configured, and the different name matching algorithms, influence how calls are routed.

About Call Capacity on the TDS Bus

The backplane of the AIswitch has 256 TDSs. Each call within the AIswitch uses two TDSs to connect, so it can handle 128 calls at one time.

Multiplexed Connections Increase Call Capacity

A multiplexed connection (MUX) is a bridge between two cards. It is continuously up. Special multiplexed-only aliases are aliases that only use a MUX to route a call. Many different aliases can use one MUX.

A MUX can pass many calls at once without affecting the number of calls the backplane can handle. The card with the lowest call capacity in a MUX determines how many calls can pass over a MUX at one time. See Figure 7-2.

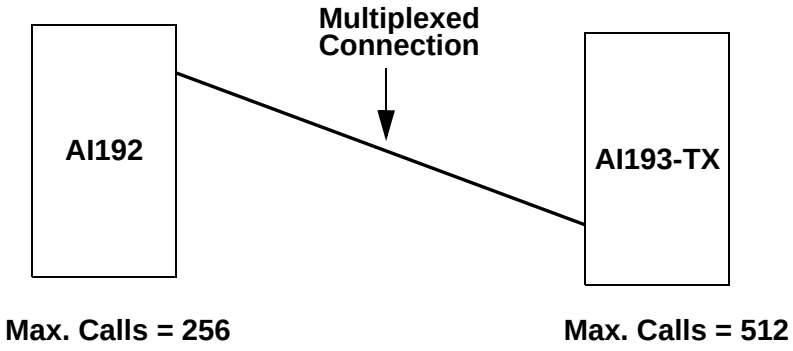

Figure 7-2 Example of MUX Call Capacity

- This MUX can handle 256 calls.
- The backplane can handle 128 calls.
- The MUX uses two TDSs, so the backplane can handle 127 additional calls. (One call uses two TDSs.)
- Therefore, an AIswitch with only this MUX configured can handle 383 calls at once.

Increase MUX Throughput with More TDSs

MUXs can use several pairs of TDSs. This increases the throughput of the connection; it speeds the data flow. This takes up more TDSs on the backplane, so you should use a few pairs of TDSs in a MUX. The number of TDSs you can use depends on your AIswitch and network configuration.

Before You Configure Call Routes

You must perform the following tasks before you can configure call routes:

- Install the AIswitch
- Configure the AIswitch (set slot density, log port, and alarm levels; add cards to the card database, etc.).

Routing Calls on the TDS Bus

Use the TDS bus if you are routing calls through cards that connect to the TDS bus. They are:

- AI183
- AI185
- AI192
- AI193
- AI196-X

There are two ways to route calls over the TDS bus:

- Simple alias translation
- Multiplexed-only connection (uses a MUX).

Simple Alias Translation

A call that is routed in the AIswitch with a simple alias translation (also called a simple alias) uses two available TDSs. The alias will either connect two unused TDSs for the call or it will send the call over a MUX, if it has free space and connects the right cards.

Creating a Simple Alias

In the Main Menu:

1. Enter **8**. Menu 8 appears.

```
                                                                    Menu 8
01 Alias name -*****************************************************************
02+Simple alias translation
03 Destination -
04 Called address -
05 This alias is visible in the destination menu-----------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -
11 Caller's protocol -
12 Alternate routing alias -

14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

2. Enter **1** and the name of the alias.

   Example: `1 ALIAS1`

3. Enter **2**. Menu 8.2 appears.

```
>2
                                                                  Menu 8.2

01 Simple alias translation
02 Multiplexed connection
03 Multiplexed only translation
04 SLC routing translation
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Enter **1** to select `Simple alias translation`. Menu 8 reappears.

5. Enter **3** and the destination name for the card where you want the call to go.

   Example: `3 196XS4`

6. Enter **8** and the call routing information.

   Example: `8 ????`

7. Enter any other items on this menu as necessary for your configuration.
8. Enter **20** to save changes.

Verifying an Alias

1. Enter **21** to return to the Main Menu.
2. To check your work, enter **9** to view the alias names in Menu 9.

Multiplexed Connections (MUXs)

The back plane has 256 TDSs, which means that the backplane can handle 128 calls at once. Depending on the slot density of the AIswitch, there are a certain number of TDSs, or ports, assigned to each slot. Generally, the slot density is 16 TDSs per card. This means that each card can have a maximum of 16 connections to other cards in the AIswitch at once.

Since simple alias translations allow only 128 calls at one time, the AIswitch allows you to set up multiplexed-only aliases using a multiplexed connection (MUX). A MUX is an alias that specifies a continuous connection between two cards. It is a more efficient way to use the TDS bus.

A MUX allows at least twice as many calls over the backplane. The number of calls that can travel over the backplane depends on the cards that are connected in a MUX.

It can pass 256 calls at one time without affecting the number of calls that the backplane can handle. Therefore, an AIswitch with one multiplexed connection can handle 510 calls at once. When the AIswitch boots, any multiplexed connections come up as the cards boot up.

Multiplexed-only aliases make specified incoming calls using a multiplexed connection in the AIswitch. Incoming calls with this type of alias use a connection already established by a MUX.

You can have several multiplexed-only aliases that use the same multiplexed connection that have different destinations. After a call uses the multiplexed connection to get to a card, the call will go to the link specified in the alias.

Calls are routed over the TDM or the IRB with aliases. Three aliases use the TDM: they are a simple alias, a multiplexed connection (MUX), an alias that only uses a MUX, and an alias that uses the IRB. Alias macros are addressed in an appendix.

Before you create a multiplexed connection:

- Gather the destination names for the two cards you want to connect.
- Choose a name for the multiplexed connection.
- Decide how many TDSs to use for the multiplexed connection.

  By spreading data from a single connection across several TDSs, you speed up the data throughput. Usually, 1 to 3 is effective.

Having this information ready will make it easier and faster to set up a MUX.

Creating a Multiplexed Connection (MUX)

In the Main Menu:

1. Enter **8**. Menu 8 appears.

```
                                                                    Menu 8
01 Alias name -*****************************************************************
02+Simple alias translation
03 Destination -
04 Called address -
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -
11 Caller's protocol -
12 Alternate routing alias -

14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

2. Enter **1** and the multiplexed connection name.

   Example: `1 MUX1`

3. Enter **2**. Menu 8.2 appears.

```
>2
                                                                  Menu 8.2

01 Simple alias translation
02 Multiplexed connection
03 Multiplexed only translation
04 SLC routing translation
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Enter **2** to select `Multiplexed connection`. Menu 8 reappears.

5. Enter **3** and the destination name for the card where you want the call to go .

   This will typically be the card that is connected to the NEs--typically the last card to boot. If you set up more than one MUX, generally use the next-to-last card to boot for subsequent MUXs.

   Example: `3 196IS4`

6. Type **8** and the destination name for where the call comes into the AIswitch.

   This will typically be the card that is connected to the network or trunk.

   Example: `8 193TXS3`

   Note: If you are creating a multiplexed connection between two trunk cards, the terminating card should be the one with the most traffic.

7. Type **9** *number_of_TDSs* and press ENTER, where *number_of_TDSs* is how many TDSs to use for the multiplexed connection to be. The default is one.

   Example: `9 2`

8. Enter **20** to save changes.

Enabling the Multiplexed Connection

1. From Menu 8, enter **21** to exit Menu 8. The Main Menu appears.
2. Enter **21** to exit the Main Menu. The prompt appears.
3. Boot the AIswitch by pressing the boot button, or enter **reset**.

Verifying the Multiplexed Connection

1. If necessary, type **ai** to enter the ai function.
2. Enter **active**.

   Example: This shows one MUX connection between two cards that uses two TDS bus connection (four total).

```
active
158-097 159-096
002 Connection(s) active
```

3. Enter **states**. You will see `mCONNECTED` beside each TDS (or TDS group) for a card that is part of a MUX.

   Example: This shows the same MUX connection as above. TDSs 96-97 are on one card and TDSs 158-159 are on another card.

```
states
0-6     SELECTING DEST          7-95    NOT BEING SCANNED
96-97   mCONNECTED              98-157  NOT BEING SCANNED
158-159 mCONNECTED              160-255 NOT BEING SCANNED
```

Aliases That Only Use MUXs

This type of alias will only connect over a specified MUX. If the MUX is down, a call routed as multiplexed only will fail and be rejected.

Creating a Multiplexed Only Alias

In the Main Menu:

1. Enter **8**. Menu 8 appears.

```
                                                                    Menu 8
01 Alias name -*****************************************************************
02+Simple alias translation
03 Destination -
04 Called address -
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -
11 Caller's protocol -
12 Alternate routing alias -

14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

2. Enter **1** and the alias name.

   Example: `1 ALIAS2`

3. Enter **2**. Menu 8.2 appears.

```
>2
                                                                  Menu 8.2

01 Simple alias translation
02 Multiplexed connection
03 Multiplexed only translation
04 SLC routing translation
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Enter **3** to select `Multiplexed only translation`. Menu 8 appears.
5. Enter **3** and the destination name for the card where you want the call to go.

   Example: `3 196IS4`

6. Enter **8** and the call routing information.

   Example: `8 ??????`

7. Enter **20** to save changes.

Verifying an Alias

1. Enter **21** to return to the Main Menu.
2. To check your work, enter **9** to view the alias names in Menu 9.

Calls Routed on the IRB

If you want to route calls through any of the following cards, you must route calls over the IRB:

- AI196-I
- AI196-IEGB
- AI196-ETS
- AI285
- AI296

Calls that are routed over the IRB do not use TDSs to connect. They must use the SLC routing translation alias. This type of alias is similar to a simple alias translation; however, this type routes calls over the IRB instead of the TDM bus.

To route calls over the IRB, you must configure an alias according to the source protocol and the destination protocol. For each protocol combination, you must enter data for menu items 1, 2, and 4. If you are routing calls from one SLC to another, you also enter data for menu item 3. Enter optional data in menu items 7, 8, 10, and 11.

Follow the instructions to create an alias name, using the tables in the section Source/Destination Protocol Tables on page 7-27. They show you how to configure an alias for a given source protocol and a given destination protocol. The tables are organized according to the source protocol as follows:

- Asynchronous without breaks
- Asynchronous with breaks
- X.25 SVC without X.29 breaks
- X.25 SVC with X.29 breaks
- X.25 PVC without X.29 breaks
- X.25 PVC with X.29 breaks
- TCP/IP without TELNET breaks
- TCP/IP with TELNET breaks

Before You Begin

- Log onto the AIswitch
- Enter the menu system.

Creating an Alias that uses the IRB

In the Main Menu:

1. Enter **8**. Menu 8 appears.

```
>21
                                                                    Menu 8
01 Alias name -*****************************************************************
02+Simple alias translation
03 Destination -
04 Called address -
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -
11 Caller's protocol -
12 Alternate routing alias -

14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

2. Enter **1** and the alias name for the incoming (source) call. (See the tables in the section Source/Destination Protocol Tables on page 7-27.)

   Example: `1 198.29.5.6#389`

3. Enter **2**. Menu 8.2 appears.

```
>2
                                                                  Menu 8.2
01 Simple alias translation
02 Multiplexed connection
03 Multiplexed only translation
04 SLC routing translation
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

4. Enter **4** to select `SLC routing translation`.
5. If you are routing calls between two SLCs, enter the IP address of the remote SLC at menu item 3.
6. Enter **4** and the called (destination) address. (See the tables in the section Source/Destination Protocol Tables on page 7-27.)

   Example: `4 x25.5.5085552992`

7. If you do want this alias to appear on the welcome screen, enter **5**. It is generally recommended that you do not have aliases appear on the welcome screen.
8. If necessary, enter **8** and the call data. (See the tables in the section Source/Destination Protocol Tables on page 7-27.)

   Example: `8 asy.3.1`
9. If necessary, enter **10** and the called protocol option.

   Example: `10 PAD`
10. If necessary, enter **11** the caller protocol option.

    Example: `11 TN`
11. Enter **20** to save this alias information.

Verifying an Alias

1. Enter **21** to return to the Main Menu.
2. To check your work, enter **9** to view the alias names in Menu 9.

Source/Destination Protocol Tables

The following tables are a reference to help you create aliases that use the IRB. They are organized according to the source protocol. The tables match source protocols with destination protocols and show you what information you need to enter for the alias. Table 7-6 describes the formats that are used in the source/destination protocol tables.

For more information on protocol processing, see the section Protocol Processing Module Descriptions on page 7-41.

Table 7-6 Data Formats on Protocol Processing

Required Data Format or Entry	**Format Entry Description**
baseport_number	Enter the number of the baseport number of the card. For example: 16, 32
link_number	Enter the number of the link. For example: 5
logical_channel_number	Enter the logical channel number. For example, 1 to 512 for PVCs. If you see ASY.link_number.1, type the 1 as shown. The 1 represents the required logical_channel_number entry of 1 for the particular situation in which it is shown.
call_data	Enter up to 16 numeric or text characters. IP calls have no call data.
called_address	Enter up to 14 digits to represent the address being called.
caller's_address	Enter up to 14 digits to represent the address of the caller.
IP_address	Enter the IP address in dotted decimal format. The # symbol must be entered as a field separator between the IP_address field and the TCP_port_number field.
TCP_port_number	Enter the TCP_port_number as a value between 1 and 65535.

Table 7-7 Asynchronous Source Without Breaks

Source	Destination	Menu Item	Information
Async	Async	01	*baseport*.**asy**.*link_number*.**1** Example: **16.asy.3.1**
		02	SLC routing translation
		04	PVC
		08	**asy**.*link_number*.**1** Example: **asy.3.1**
Async	X.25 SVC	01	*baseport*.**asy**.*link_number*.**1** Example: **16.asy.3.1**
		02	SLC routing translation
		04	**x25**.*link_number*.*called_address* Example: **x25.5.5085552992** Or, type **x25**.*link_number*. and either: menu item 07: *caller_address* menu item 08: *call_user_data*

Table 7-8 Asynchronous Source With Breaks

Source	Destination	Menu Item	Information
Async, Async TL1, Async packetized on a CR (or .02 s idle time)	X.25 SVC with X.29 break	01	*baseport*.**asy**.*link_number*.**1** Example: **16.asy.3.1**
		02	SLC routing translation
		04	**x.25**.*link_number*.*called_address* Example: **x25.5.5085552992** Or, type **x25**.*link_number*. and either: menu item 07: *caller_address* menu item 08: *call_user_data*
		10	PAD
		11	Async: **=""** Async TL1: **TL1** Async packetized: **PKT -P13 -I2**
Async, Async TL1, Async packetized on a CR (or .20 s idle time)	X.25 PVC with X.29 break	01	*baseport*.**asy**.*link_number*.**1** Example: **16.asy.3.1**
		02	SLC routing translation
		04	PVC
		08	**x25**.*link_number.LCN_number* Example: **x25.5.6**
		10	PAD
		11	Async: **=""** Async TL1: **TL1** Async packetized: **PKT -P13 -I2**

Table 7-8 Asynchronous Source With Breaks (Continued)

Source	Destination	Menu Item	Information
Async	TCP with telnet break	01	*baseport*.**asy**.*link_number*.**1** Example: **16.asy.3.1**
		02	SLC routing translation
		04	Destination IP address: *IP_address#TCP_port_number* Example: **198.29.5.6#389**
		10	TN
		11	**=""**

Table 7-9 X.25 SVC Source Without Breaks

Source	Destination	Menu Item	Information
X.25 SVC	X.25 SVC	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	**x25**.*link_number*.*called_address* Example: **x25.5.5085552992** Or, type **x25**.*link_number*. and either: menu item 07: *caller_address* menu item 08: *call_user_data*
X.25 SVC	X.25 PVC	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	PVC
		08	**x25**.*link_number.LCN_number* Example: **x25.5.6**

Table 7-9 X.25 SVC Source Without Breaks (Continued)

Source	Destination	Menu Item	Information
X.25 SVC	TCP	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	Destination IP address: *IP_address#TCP_port_number* Example: **198.29.5.6#389**
X.25 SVC	AI193-TX TCP with N protocol option	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	Destination AI193-TX *IP_address#TCP_port_number* Example: **199.30.7.5#241**
		10	AEP
		11	**=""**
X.25 SVC	Async	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	PVC
		08	**asy**.*link_number*.**1** Example: **asy.5.1**

Table 7-10 X.25 SVC Source With Breaks

Source	Destination	Menu Item	Information
X.25 SVC, X.25 SVC and reply to X.29 break	TCP with telnet break	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	Destination IP address *IP_address#TCP_port_number* Example: **198.29.5.6#389**
		10	TN
		11	PAD
X.25 SVC	AI193-TX TCP with N protocol option	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	Destination IP address: *IP_address#TCP_port_number* Example: **199.30.7.5#241**
		10	AEP
		11	**=""**
X.25 SVC, X.25 SVC with TL1 packetizing and X.29 break	Async with async break, Async TL1 with async break, Async packetized on CR (or .02 s idle time)	01	Call user data or called address or caller's address
		02	SLC routing translation
		04	PVC
		08	**asy**.*link_number*.**1** Example: **asy.5.1**
		10	Async: (leave blank) Async TL1: **TL1** Async packetized: **PKT -P13 -I2**
		11	SVC: PAD SVC with TL1: PAD TL1

Table 7-11 X.25 PVC Source Without Breaks

Source	Destination	Menu Item	Information
X.25 PVC	X.25 SVC	01	*baseport*.**x25**.*link_number*.*LCN_number* Example: **16.x25.3.2**
		02	SLC routing translation
		04	**x25**.*link_number*.*called_address* Example: **x25.5.5085552992** Or, type **x25**.*link_number*. and either: menu item 07: *caller_address* menu item 08: *call_user_data*
X.25 PVC	X.25 PVC	01	*baseport*.**x25**.*link_number*.*LCN_number* Example: **16.x25.3.2**
		02	SLC routing translation
		04	PVC
		08	**x25**.*link_number*.*LCN_number* Example: **x25.5.6**
X.25 PVC	TCP	01	*baseport*.**x25**.*link_number*.*LCN_number* Example: **16.x25.3.2**
		02	SLC routing translation
		04	Destination IP address *IP_address#TCP_port_number* Example: **198.29.5.6#389**

Table 7-11 X.25 PVC Source Without Breaks (Continued)

Source	Destination	Menu Item	Information
X.25 PVC	Async	01	*baseport*.**x25**.*link_number*.*LCN_number* Example: **16.x25.3.2**
		02	SLC routing translation
		04	PVC
		08	**asy**.*link_number*.**1** Example: **asy.5.1**

Table 7-12 X.25 PVC Source With Breaks

Source	Destination	Menu Item	Information
X.25 PVC, X.25 PVC and reply to X.29 break	TCP with telnet break	01	*baseport.***x25***.link_number.LCN_number* Example: **16.x25.3.2**
		02	SLC routing translation
		04	Destination IP address *IP_address#TCP_port_number* Example: **198.29.5.6#389**
		10	TN
		11	PAD

Table 7-12 X.25 PVC Source With Breaks (Continued)

Source	Destination	Menu Item	Information
X.25 PVC, X.25 PVC with TL1 packetizing and X.29 break	Async with async break, Async TL1 with async break, Async packetized on a CR (or .02 s idle time)	01	*baseport.***x25***.link_number.LCN_number* Example: **16.x25.3.2**
		02	SLC routing translation
		04	PVC
		08	**asy**.*link_number*.**1** Example: **asy.5.1**
		10	Async: (leave blank) Async TL1: **TL1** Async packetized: **PKT -P13 -I2**
		11	X.25 PVC: PAD X.25 PVC TL1: PAD TL1

Table 7-13 TCP/IP Source Without Telnet Breaks

Source	Destination	Menu Item	Information
TCP	X.25 SVC	01	*IP_address#TCP_port_number* Example: **198.29.5.6#389**
		02	SLC routing translation
		04	**x25**.*link_number.called_address* Example: **x25.5.5085552992** Or, type **x25**.*link_number.* and either: menu item 07: *caller_address* menu item 08: *call_user_data*
TCP	X.25 PVC	01	*IP_address#TCP_port_number* Example: **198.29.5.6#389**
		02	SLC routing translation
		04	PVC
		08	**x25**.*link_number.LCN_number* Example: **x25.3.9**
TCP	TCP	01	*IP_address#TCP_port_number* Example: **198.29.5.6#389**
		02	SLC routing translation
		04	Destination IP address *IP_address#TCP_port_number* Example: **198.29.5.6#389**
TCP	Async	01	*IP_address#TCP_port_number* Example: **198.29.5.6#389**
		02	SLC routing translation
		04	PVC
		08	**asy**.*link_number*.**1** Example: **asy.3.1**

Table 7-14 TCP/IP Source With Telnet Breaks

Source	Destination	Menu Item	Information
TCP	X.25 SVC with X.29 break	01	*IP_address#TCP_port_number* Example: **198.29.5.6#389**
		02	SLC routing translation
		04	**x25***.link_number.called_address* Example: **x25.5.5085552992** Or, type **x25***.link_number.* and either: menu item 07: *caller_address* menu item 08: *call_user_data*
		10	PAD
		11	TN
TCP	X.25 PVC with X.29 break	01	*IP_address#TCP_port_number* Example: **198.29.5.6#389**
		02	SLC routing translation
		04	PVC
		08	**x25***.link_number.LCN_number* Example: **x25.3.9**
		10	PAD
		11	TN
TCP	Async with async break	01	*IP_address#TCP_port_number* Example: **198.29.5.6#389**
		02	SLC routing translation
		04	PVC
		08	**asy***.link_number.***1** Example: **asy.3.1**
		11	TN

Example of Call Processing Data Flow

The following illustration (Figure 7-3) and explanation show a typical situation in which a call is routed over the IRB. Data flow is upstream or downstream, depending on the direction flow from which the data originates.

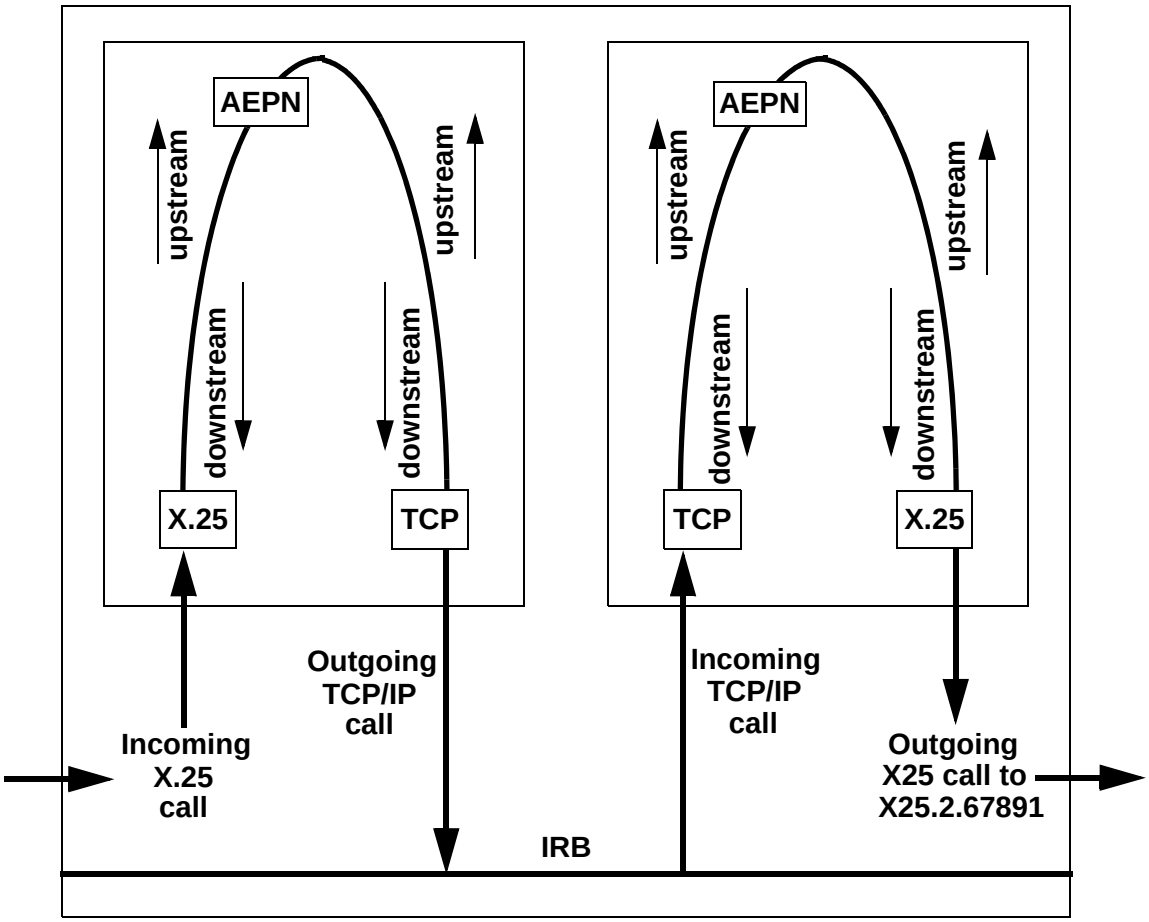

Figure 7-3 Illustration of Call Data Flow

Explanation of Call Data Flow Illustration

In Figure 7-3, an X.25 protocol call is coming into AI296 card A and needs to be sent out AI296 card B passing over the IRB. Refer to the illustration to follow the flow of the call.

These steps occur if the data flow is from left to right:

1. The data comes into AI296 card A as an X.25 packet.

2. The data travels upstream and is converted into a TCP call.

   Menu 8 item 10 is AEPN.

   Menu 8 item 11 is **=""**.

3. The data starts downstream through the AEPN protocol option to preserve the packetization.
4. The data is then sent out the AI296 card A over TCP on the IRB.
5. The TCP packet is received by AI296 card B.
6. The data travels upstream through the AEPN protocol option to preserve the packetization.

   Menu 8 item 10 has no entry.

   Menu 8 item 11 is AEPN.

7. The data packet is converted, travels downstream, and is transmitted out the AI296 as X.25 protocol with the original packetizing characteristics preserved.

   The following is an example for SLC A:

```
                                                                        Menu 8
01 Alias name ------------------------------------------------------------12345
02+SLC routing translation
03 Destination -
04 Called address ----------------------------------------172.16.30.200#5000
05 This alias is visible in the destination menu---------------------------YES
06 Link number is (1..4) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -------------------------------------------------------AEPN
11 Caller's protocol -----------------------------------------------------=""
12 Alternate routing alias -
.
.
Enter item number and optional ",value" then push <CR> key
```

   The following is an example for SLC B:

```
                                                                        Menu 8
01 Alias name ------------------------------------------------172.16.30.200#5000
02+SLC routing translation
03 Destination -
04 Called address ---------------------------------------------------X25.2.67891
05 This alias is visible in the destination menu---------------------------YES
06 Link number is (1..4) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -
11 Caller's protocol -----------------------------------------------------AEPN
12 Alternate routing alias -
.
.
Enter item number and optional ",value" then push <CR> key
```

Protocol Processing Module Descriptions

Protocol processing modules let you choose how information passes from one protocol to another. Some modules are only useful for a particular protocol. The PKT module, for example, buffers all received data until a specified character is received in the data. Another example, the TN module looks for telnet commands embedded in the data.

This section is a reference about protocol processing modules. To use these modules see the section Source/Destination Protocol Tables on page 7-27.

The AI198 supports the following protocol processing modules:

- Applied Innovation Encapsulation Protocol (AEP)
- Applied Innovation Encapsulation Protocol with Network Option (AEPN)
- Packet Assembler Disassembler (PAD)
- Packetizing module (PKT)
- Record Boundary Preservation (RBP)
- Translation Language One (TL1)
- Telnet module (TN)

AEP, AEPN, PAD, PKT, and TN can be combined to allow break propagation between the following protocols:

- X.25 (with X.29 break) to asynchronous break
- X.25 (with X.29 break) to telnet break
- Asynchronous break to X.25 (with X.29 break)
- Asynchronous break to telnet break
- Telnet break to X.25 (with X.29 break)
- Telnet break to asynchronous break
- X.29 break propagation across TCP connections between two SLCs
- Asynchronous break propagation across TCP connections between two SLC cards
- Response to an indication of X.29 break

Use arguments to specify how a module should work. For example, the PKT module accepts parameters which specify characters should be filtered out of the data and on which characters packetize.

For optional protocol arguments, enter numbers separated by a comma either in octal (base 8), hexadecimal (base 16), or decimal (base 10). Octal numbers have a leading zero (ex. 010). Hexadecimal numbers have a leading 0x (ex. 0x10). Type characters as their ASCII value. Do not use decimal points, tabs, or spaces in these menu items.

Table 7-15 Protocol Argument Number Formats

Entry	Type	Description
0x0d	Hexadecimal	Carriage return
59	Decimal	Semi-colon
0141	Octal	Letter "a"
55	ASCII decimal	Number 7

When a *d* argument option is included with the argument, at least one value is required. The *d* argument is the ASCII value for a character, and the range of values is 0 to 255.

AEP

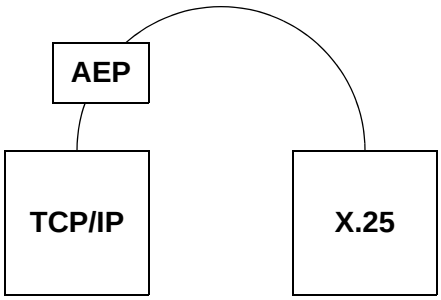

Figure 7-4 Illustration of AEP

Applied Innovation Encapsulation Protocol (AEP) works with messages traveling between X.25 and TCP/IP protocols. AEP adds information to the data, preserving X.25 information and packetization as the data travels over a TCP/IP network. It does not convert the actual X.25 information. This protocol keeps packet boundaries intact, which is useful for X.25 applications that are highly sensitive to packet integrity. This type of protocol can be put on a TCP data stream.

AEPN

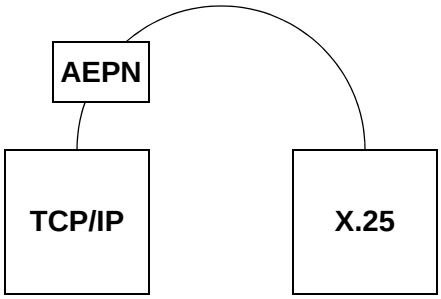

Figure 7-5 Illustration of AEPN

Applied Innovation Encapsulated Protocol with the Network option (AEPN) is for messages traveling between X.25 and TCP/IP protocols. In addition to the services provided by the AEP protocol, the AEPN also passes X.26 Q-bit information over a TCP/IP connection. This allows the remote end to include this information when converting data back to X.25.

This protocol also handles special information such as break signals. This protocol keeps packet boundaries intact, which is especially useful for some X.25 applications that are highly sensitive to packet integrity. This type of protocol can be put on a TCP data stream.

PAD

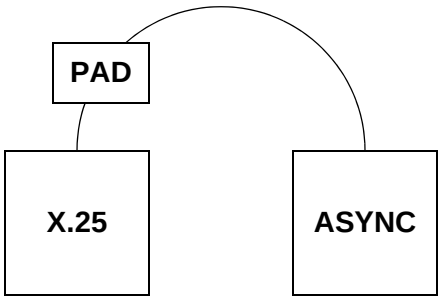

Figure 7-6 Illustration of PAD

Packet Assembler Disassembler (PAD) works with messages traveling between X.25 and asynchronous protocols. The X.25 protocol does not use break signals, but the asynchronous protocol does. PAD converts X.25 Q-bits into asynchronous breaks, and vice versa.

This protocol processing module can be put on an X.25 data stream.

Table 7-16 PAD Defaults and Optional Parameters

Default	Optional Parameter
Passes break upstream	`-U` Does not pass break upstream
Passes break downstream	`-D` Does not pass break downstream
Does not reply to break	`-R` Does reply to X.25 break

Example

`PAD -U` Provides PAD break handling, but prevents break from being propagated upstream.

PKT

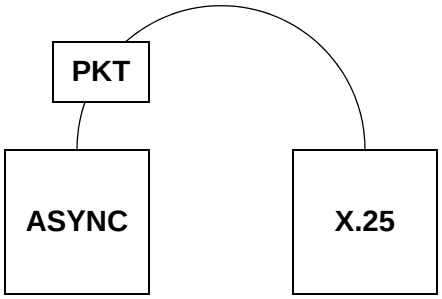

Figure 7-7 Illustration of PKT

The packetizing (PKT) module holds data as it arrives until the AI296 receives specified characters (such as new lines). Once the packetizing character is received, all of the data that has been held is passed on as a single packet. This module also allows data to be packetized on a timer, which you can set. It also allows you to specify which characters, if any, to be filtered out of the data stream. PKT works on all protocols.

The following table describes the PKT defaults and the optional parameters.

Table 7-17 PKT Defaults and Optional Parameters

Default	Optional Parameters	
Sets no packetizing characters	**-T***d*	This sets the packetizing timer to *d* hundredths of a second. It packetizes *d* hundredths of a second after the last time it was packetized. By setting *d* to zero, you turn off this option.
Sets no idle packetizing timer	**-I***d*	This sets the idle packetizing timer to *d* hundredths of a second. It packetizes after *d* hundredths of a second after not receiving any new characters.
Sets packetizing timer to .06 seconds	**-P***d, d, d*	This sets the packetizing characters to the numbers entered in each *d* option. Specify up to 16 characters.
Sets no filter characters	**-F***d, d, d*	This sets the filter characters to the numbers entered in each *d* option. Specify up to 16 characters. It is possible to packetize on a filtered character.
Passes break upstream	**-U**	This prevents passing a break upstream.
Passes break downstream	**-D**	This prevents passing a break downstream.
Discards unpacketized data when passing break upstream	**-S**	This packetizes on a specific sequence of characters. Enter up to 16 characters. The packet module accepts only one **-S** parameter.

PKT Examples

PKT -T6	Sets the packetizing timer to .06 seconds.
PKT -P0xD,0x3B	Sets the packetizing characters to carriage return and semi-colon.
PKT -F10,127	Filters out the characters for line feed and delete.
PKT -U	Prevents break from being propagated upstream.
PKT -I10 -P0x0D -D	Provides packetizing on carriage return or .10 seconds of idle time, and prevents break from being propagated downstream.
PKT -S13,10	Sets the sequence to carriage return followed by a line feed.

RBP

Record Boundary Preservation (RBP) is a Cisco protocol that works with messages traveling between X.25 and TCP/IP protocols. RBP adds information to the data, preserving X.25 information and packetization as the data travels over a TPC/IP network.

RBP does not convert the actual X.25 information. This protocol keeps packet boundaries intact, which is useful for X.25 applications that are highly sensitive to packet integrity.

This type of protocol can be put on a TCP data stream.

The optional parameter is shown below.

RBP -M*d*	Sets the maximum record size to number of bytes. RBP will split an incoming X.25 data packet across multiple records so that no single record exceeds this value. X.25 packets with the M-bit set will be combined as long as the resulting record does not exceed this value. If this value is not set (default), each X.25 data packet will be converted into exactly one record. The minimum value allowed for this parameter is 256 and the maximum is 1500.

TL1

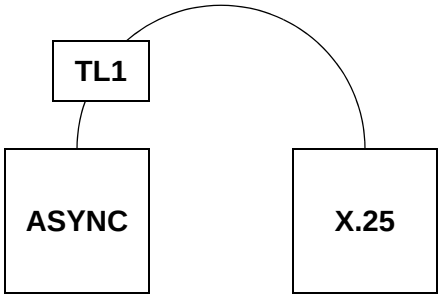

Figure 7-8 Illustration of TL1

The Translation Language One (TL1) module typically works with messages traveling between X.25 and asynchronous protocols. However, it also works with all protocols.

Some OSSs require that each TL1 command/response be fully contained in one X.25 packet. By packetizing on the TL1 termination characters (";<>"), the TL1 module ensures that each TL1 command/response is transmitted in one X.25 packet.

Table 7-18 TL1 Defaults and Optional Parameters

Default	**Optional Parameter**	
Sets not packetizing timer	**-T***d*	This sets the packetizing timer to *d* hundredths of a second. It packetizes *d* hundredths of a second after the last time it was packetized. Setting *d* to zero turns off this option.
Sets not idle packetizing timer	**-I***d*	This sets the idle packetizing timer to *d* hundredths of a second. It packetizes after *d* hundredths of a second after not receiving any new characters.
Sets TL1 packetizing characters	**-P***d, d, d*	This sets the packetizing characters to the numbers entered in each *d* option. Specify up to 16 characters.
Sets no filter characters	**-F***d, d, d*	This sets the filter characters to the numbers entered in each *d* option.
Passes break upstream	**-U**	This prevents passing a break upstream.
Passes break downstream	**-D**	This prevents passing a break downstream.

TL1 Examples

`TL1 -T6`	Sets the packetizing timer to .06 seconds.
`TL1 -F10,127`	Filters out the characters for line feed and delete.
`TL1 -U`	Prevents break from passing upstream.
`TL1 -120 -D`	Provides TL1 packetizing on TL1 delimiters or 20 seconds of idle time. Prevents break from passing downstream.

TN

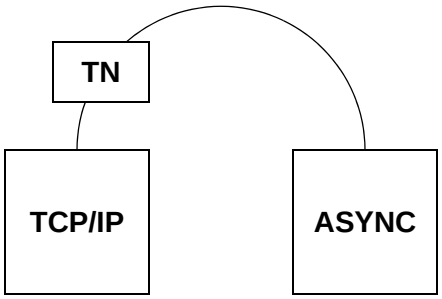

Figure 7-9 Illustration of TN

The telnet (TN) module filters **`telnet`** commands out of the data stream and processes them appropriately. It also adds commands, as necessary, to the data as it travels downstream. When a **`telnet`** break is received, it is converted to an X.25 or asynchronous break as required. When an X.25 or asynchronous break is received from upstream, it is converted to a **`telnet`** break and passed downstream.

Table 7-19 TN Defaults and Optional Parameters

Default	**Optional Parameter**	
Passes break upstream	**`-U`**	This prevents passing a break upstream.
Passes break downstream	**`-D`**	This prevents passing a break downstream.
Initiates telnet negotiation for DO SGA and WILL SGA	**`-E`***`d, d, d`*	This initiates telnet negotiation for WILL Echo, WILL Suppress Go Ahead (SGA), and DO SGA. This is useful when a telnet connection is made to a remote device which provides an echo. If you specify *`d, d, d,`* then you modify the telnet negotiation string, which can be up to 32 characters.

TN Examples

TN -U	This provides telnet handling, but prevents break from being propagated upstream.
TN -E	This provides telnet handling and initiates telnet negotiation for Will Echo, Will SGA, and Do SGA.
TN -E255,253,1	This provides telnet handling and causes the telnet session to send IAC (255) DO(253) ECHO (1) when the connection is initiated. Initiates DO Echo, WILL SGA, and DO SGA.

Examples of IRB Routing

Using a Single Alias for Routing Calls Between Two SLCs

You can route X.25 call information over a TCP connection from one SLC to another SLC with a single alias. Enter the IP address of the outgoing SLC in the Destination menu item 3 to use the single alias feature. You do not need a TCP port number.

PVC to PVC Connection Example

In Figure 7-10, the X.25 data on the incoming AI296 is on baseport 16, link 2, and LCN 3. The alias is set to 16.X25.2.3.

When the call comes into the incoming AI296, the call is routed to the outgoing AI296. The call then continues out the outgoing AI296 on baseport 32, link 1, and LCN 4.

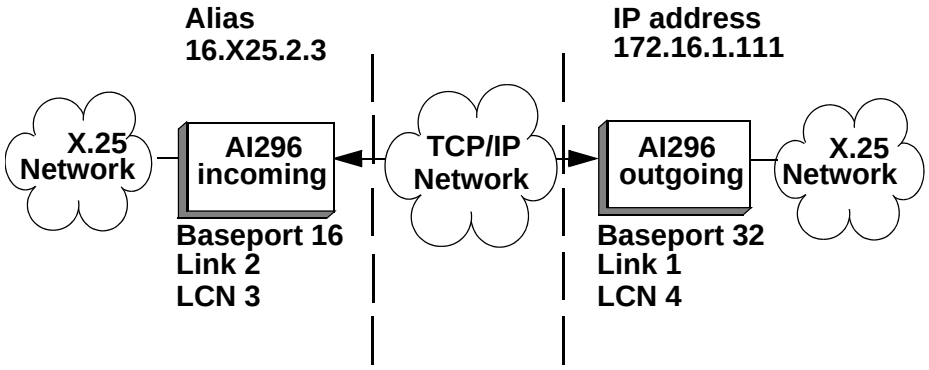

Figure 7-10 PVC to PVC Connection Diagram

The primary menu items on the AI198 Menu 8 used for the single alias are set as follows for the PVC to PVC example.

```
                                                                    Menu 8
01 Alias name -*****************************************************16.X25.2.3
02+SLC routing translation
03 Destination ----------------------------------------------------172.16.1.111
04 Called address ------------------------------------------------------------ PVC
05 This alias is visible in the destination menu-------------------------- YES
06 Link number is (1..4) -
07 Caller's address -
08 Call data ------------------------------------------------------------X25.1.4
09 App. string -
10 Called protocol -
11 Caller's protocol ---------------------------------------------------------- TL1
12 Alternate routing alias -
```

01 Alias name

This menu item contains the name of the single alias, 16.X25.2.3 (baseport_number.protocol_type.link_number.LCN_number).

This setting indicates that the PVC on link 2, LCN 3 on the SLC in baseport 16 is processed by this alias.

03 Destination

This menu item, because it is not empty, indicates that the alias is a single alias translation. The contents, 172.16.1.111, give the IP address of the outgoing SLC.

04 Called address

This menu item specifies that the connection from the outgoing SLC will be over the PVC specified in menu item `08 Call data`. The PVC must exist on the outgoing SLC.

08 Call data

This menu item specifies the PVC on the outgoing SLC. The data, X25.1.4, indicates the outgoing connection is on link 1, LCN 4.

11 Caller's protocol

This menu item contains the protocol modules and the protocol parameters for processing data onto the incoming X.25 call. In this example, the incoming data uses TL1 protocol.

SVC to SVC Connection Example

In Figure 7-11, the X.25 data on the incoming AI296 is on baseport 16, link 2, LCN 3, with a called address of 6145551234.

The call continues on the outgoing AI296 on baseport 32, link 4, LCN 8.

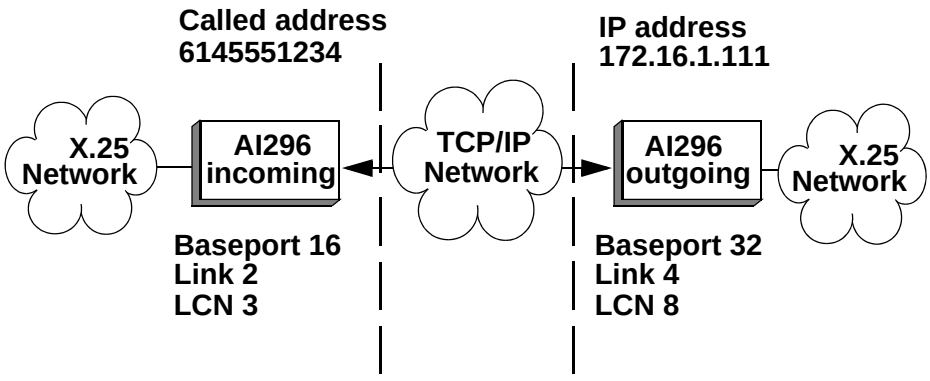

Figure 7-11 SVC to SVC Connection Diagram

The primary menu items on the Menu 8 used for the single alias are set as follows for the SVC to SVC example.

```
                                                                    Menu 8
01 Alias name -*****************************************************6145551234
02+SLC routing translation
03 Destination ----------------------------------------------------172.16.1.111
04 Called address ------------------------------------------- X25.4.6145553897
05 This alias is visible in the destination menu-------------------------- YES
06 Link number is (1..4) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol ------------------------------------------------------- TL1
11 Caller's protocol -
12 Alternate routing alias -
```

01 Alias name

This menu item contains the call user data, called address, or caller's address.

03 Destination

This menu item, because it is not empty, indicates that the alias is a single alias translation. The contents of this menu item, 172.16.1.111, give the IP address of the outgoing SLC.

04 Called address

This menu item specifies that the outgoing connection from the SLC will be an X.25 SVC on link 4 for the address 6145553897.

10 Called protocol

This menu item contains the protocol modules and the protocol parameters for processing data onto the outgoing X.25 call. In this example, the outgoing data uses TL1 protocol.

SVC to PVC Connection Example

In Figure 7-12, the X.25 data on the incoming AI296 is on baseport 16, link 2, LCN 3, with a called address of 6145551234.

The call continues on the outgoing AI296 on baseport 32, link 1, LCN 4.

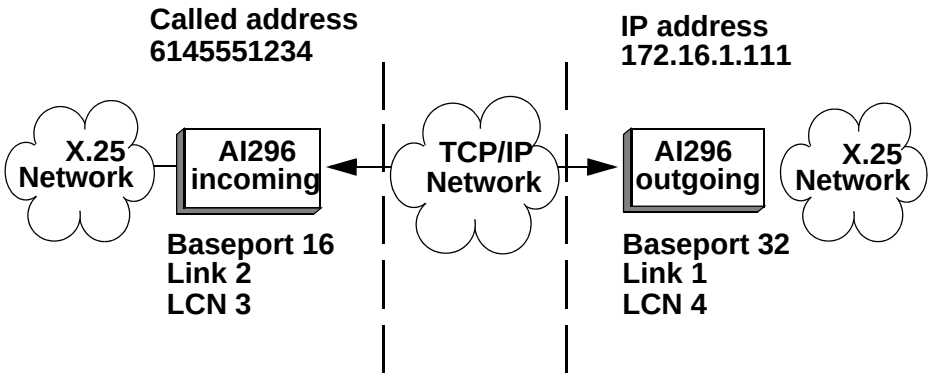

Figure 7-12 SVC to PVC Connection Diagram

The menu items on the Menu 8 used for the single alias are set as follows for the SVC to PVC example.

```
                                                                  Menu 8
01 Alias name -*********************************************************6145551234
02+SLC routing translation
03 Destination ----------------------------------------------------172.16.1.111
04 Called address ------------------------------------------------------------ PVC
05 This alias is visible in the destination menu--------------------------- YES
06 Link number is (1..4) -
07 Caller's address -
08 Call data ------------------------------------------------------------X25.1.4
09 App. string -
10 Called protocol ------------------------------------------------------------ TL1
11 Caller's protocol -
12 Alternate routing alias -
```

01 Alias name

This menu item contains the call user data, called address, or caller's address.

03 Destination

This menu item, because it is not empty, indicates that the alias is a single alias translation. The contents, 172.16.1.111, give the IP address of the outgoing SLC.

04 Called address

This menu item specifies that the connection from the outgoing SLC will be over the PVC specified in the `08 Call data` menu item. The PVC must exist on the outgoing SLC.

08 Call data

This menu item specifies the PVC on the outgoing SLC. The data, X25.1.4, indicates that the outgoing connection is on link 1, LCN 4.

10 Called protocol

This menu item contains the protocol modules and the protocol parameters for processing data onto the outgoing X.25 call. In this example, the outgoing data uses TL1 protocol.

PVC to SVC Connection Example

In Figure 7-13, the incoming X.25 data on the incoming SLC is on baseport 16, link 2, LCN 3, with the alias of 16.X25.2.3.

When the call comes into the incoming AI296, the call is routed to the outgoing AI296.

The call then continues out the outgoing AI296 on baseport 32, link 4, LCN 8.

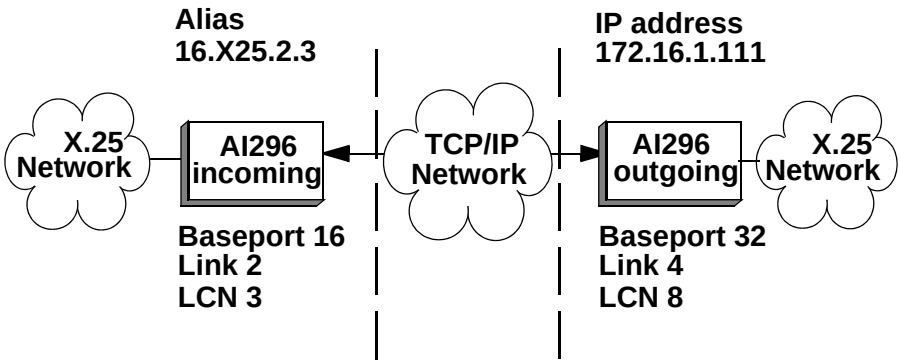

Figure 7-13 PVC to SVC Connection Diagram

The menu items on Menu 8 used for the single alias are set as follows for the PVC to SVC example.

```
                                                                    Menu 8
01 Alias name -*****************************************************16.X25.2.3
02+SLC routing translation
03 Destination ------------------------------------------------------172.16.1.111
04 Called address ---------------------------------------------X25.4.6145553897
05 This alias is visible in the destination menu-------------------------- YES
06 Link number is (1..4) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -
11 Caller's protocol ------------------------------------------------------ TL1
12 Alternate routing alias -
```

01 Alias name

This menu item contains the name of the single alias, 16.X25.2.3. This setting indicates that the PVC on link 2, LCN 3 on the SLC in baseport 16 is processed by this alias.

03 Destination

This menu item, because it is not empty, indicates that the alias is a single alias translation. The contents, 172.16.1.111, give the IP address of the outgoing SLC.

04 Called address

This menu item specifies that the connection from the outgoing SLC is an X.25 SVC on link 4 for the address 6145553897.

11 Caller's protocol

This menu item contains the protocol modules and the protocol parameters for processing data onto the incoming X.25 call. In this example, the incoming data uses TL1 protocol.

Example of MLT Routing

You can route MLT call information through a TCP/IP network using aliases. The example in Figure 7-14 shows how aliases can be set up to route an MLT call. The example shows the configuration of one alias on a AI296 card connected to the host and the configuration of another alias on an AI296 card connected to an NE.

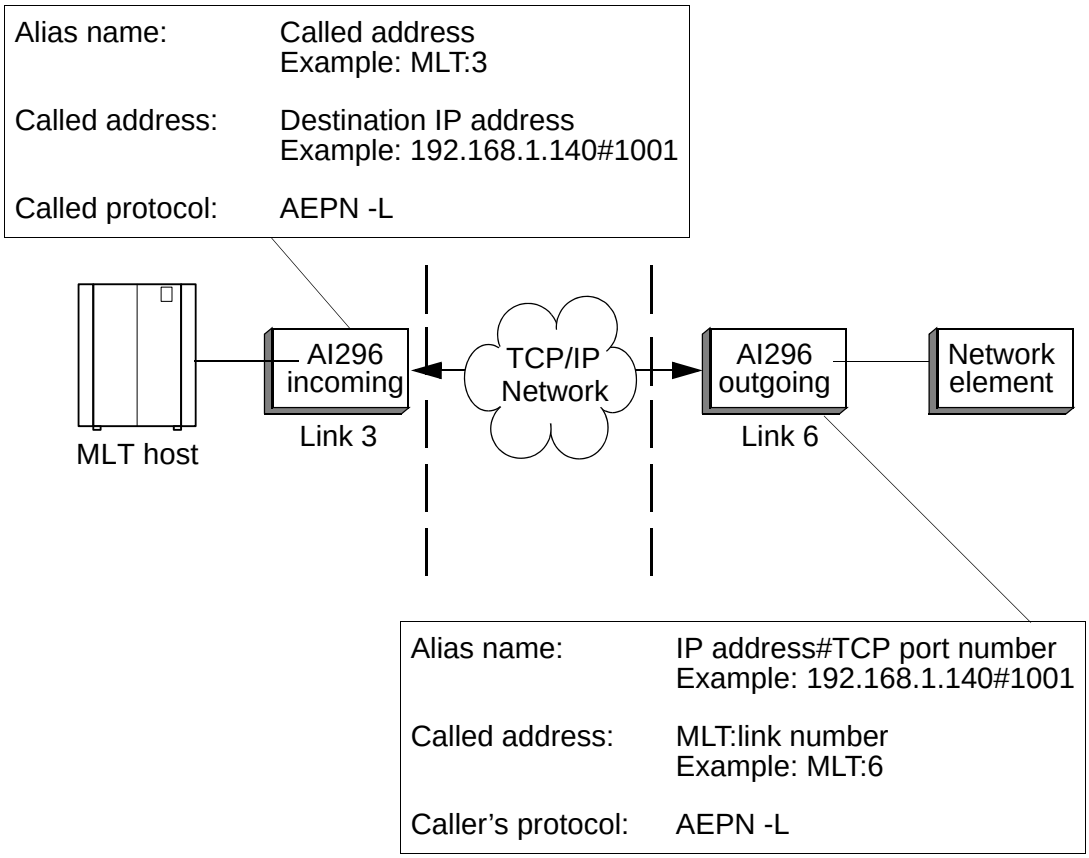

Figure 7-14 MLT Call Routing Example

Aliases used for MLT call routing are set up in Menu 8.

The following indicates how the menu items would be set up for the MLT host alias shown in Figure 7-14 on page 7-56.

```
                                                                    Menu 8
01 Alias name ------------------------------------------------------MLT.3
02+Simple alias translation
03 Destination -
04 Called address ----------------------------------------192.168.1.140#1001
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol ------------------------------------------------------AEPN -L
11 Caller's protocol -
12 Alternate routing alias -

14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
>
```

The following indicates how the menu items would be set up for the MLT network element alias shown in Figure 7-14 on page 7-56.

```
                                                                    Menu 8
01 Alias name ------------------------------------------192.168.1.140#1001
02+Simple alias translation
03 Destination -
04 Called address ------------------------------------------------------MLT:6
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol ------------------------------------------------------AEPN -L
11 Caller's protocol -
12 Alternate routing alias -

14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
>
```

Menu Descriptions

Use Menu 8 and 8.2 in the AI198 menu system to configure aliases that the SLC will use to route calls.

Menu 8

Use Menu 8 to configure call routing alias translations as well as multiplexed connections.

```
                                                                    Menu 8
01 Alias name -*****************************************************************
02+Simple alias translation
03 Destination -
04 Called address -
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -
09 App. string -
10 Called protocol -
11 Caller's protocol -
12 Alternate routing alias -

14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

You can enter the slot to IP address macro **=IP***(baseport)* instead of using the entire IP address in all Menu 8 items except 02 and 05. **IP** is the keyword and *baseport* is the baseport of the card. This macro returns the IP address of the card at the baseport. Using this macro, the user does not need to know the IP address of the card or modify the alias if the IP address is changed.

Note: The **=IP***(baseport)* macro is available for i-base card types (such as the AI196i) and should only be used in a SLC translation alias type.

Below are the general descriptions for each item as it affects the AI198. For information on how to configure aliases for a specific Smart Line Card, refer to the appropriate user's manual.

01 Alias name

For this menu item, enter a unique name that identifies the alias. You may enter an alias name of up to 200 characters. The switch translates this alias name into a call of the type defined in the remaining items in this menu.

The alias name may include leading, trailing, or embedded wildcard matching characters. You may enter an asterisk (*) which replaces zero or more characters, a question mark (?) which replaces one character, or you may enter an alias macro starting with an equal sign (=).

02+Alias translation type...

Select this item to display Menu 8.2, which enables you to define the type of translation that will occur when the incoming call data matches the value entered in item 1.

03 Destination

This item is used to provide the destination name configured in Menu 2, needed to complete the desired connection. To function properly as a destination name, this item must have been configured using Menu 4 as a destination for a range of ports or evaluated as a legal TDS number. For type 3, this item provides the name of the multiplexed connection originator.

You may enter the actual destination name, or enter it as an Alias Macro starting with an equal sign (=).

04 Called address

Enter the called address for this alias. You may type the actual address (up to 200 characters, not entering leading zeros) or you may type an alias macro starting with an equal sign (=).

05 This alias is visible in the destination menu

This item toggles whether or not this name is visible in the destination menu.

06 Link number is...

This item identifies the link to which the call will be directed. Enter the link number as an Alias Macro starting with an equal sign (=).

07 Caller's address

This menu item identifies the address of the entity originating the call. It may contain up to 200 characters. The caller's address may be entered directly, or you may enter an alias macro string starting with an equal sign (=).

08 Call data

The call data field may contain up to 200 characters. The specific data to be entered will be dependent on the SLC being used. Call data may be directly entered as an Alias Macro starting with an equal sign (=).

09 App. string

The specific data to be entered will be dependent on the SLC being used, which may require additional information to properly process the call. This extended string may contain up to 200 characters and may be directly entered or entered as an Alias Macro starting with an equal sign (=).

10 Called protocol

This field is optional and may be used to specify the called protocol (up to 200 characters) for a call placed using this alias. Protocol options are SLC specific. Not all options are usable with all cards. For valid entries, refer to the protocol option sections in the appropriate Smart Line Card user's manual.

11 Caller's protocol

This field is optional and may be used to specify the caller's protocol for a call placed using this alias. Protocol options are SLC specific. Not all options are usable with all cards. For valid entries, refer to the protocol option sections in the appropriate Smart Line Card user's manual.

If no entry is made for this option, the protocol code entered in menu 8.10 will be copied during call processing. To prevent this, enter an equal sign (=) for this protocol.

12 Alternate routing alias

This item specifies an alternate alias which the system may use to place a call should it be unable to place the call using the first alias. It may be entered directly with up to 200 characters or it may be entered as an Alias Macro starting with an equal sign (=).

14+Test macros

This item contains a submenu for testing alias macros. See Menu 8.14 for information on how to test alias macros.

15 Show entire alias

Select this item to display the entire alias.

16 Show the first entry in the alias translation table

Select this item to display the first alias entered in the alias translation table.

17 Show the previous entry in the alias translation table

Select this item to display the previous entry in the alias translation table.

18 Show the next entry in the alias translation table

Select this item to display the next entry in the alias translation table.

19+Delete the above alias translation entry

Select this item to display a submenu to delete the printed alias translation.

```
                                                                    Menu 8.19
   Alias name ------------------------------------------------------------614
   Simple alias translation
   Destination -----------------------------------------------------------
   Called address --------------------------------------------------------
   This alias is visible in the destination menu--------------------------NO
   Link number is (1..16) ------------------------------------------------
   Caller's address ------------------------------------------------------
   Call data -------------------------------------------------------------
   App. string -----------------------------------------------------------
   Called protocol -------------------------------------------------------
   Caller's protocol -----------------------------------------------------
   Alternate routing alias -----------------------------------------------
.
Are you sure you wish to delete this alias (Y/N)?
```

20 Save the changes made (20b: to the beginning, 20e: to the end)

Select this item to move aliases to the beginning or to the end of the alias translation table. 20b moves the alias to the beginning. 20e moves the alias to the end. 20 saves the existing alias in the current position and a new alias to the end. This also saves the changes you made in Menus 8.2 and 8.14.

21 Exit this menu with no changes

If you do not want to save your work, or if you have already saved your changes using item 20, select this menu item to return to the Main Menu.

Menu 8.2

This screen displays the menu items available from Menu 8.2

```
                                                                    Menu 8.2
01 Simple alias translation
02 Multiplexed connection
03 Multiplexed only translation
04 SLC routing translation
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

01 Simple alias translation

Simple alias translations are the standard mechanism for call routing. They allow incoming calls to be identified, their parameters modified and outgoing calls to be placed.

This item is also used to cause a call to terminate at a particular TDS if item 8.3 evaluates an integer. As an example, this translation can be used for X.25 to X.25 connections, and X.25 to Ethernet connections.

02 Multiplexed connection

This item is used to configure the system for a direct connection between two SLCs which may then be used for numerous multiplexed logical connections. The number n is inserted in the application specific string (item 8.9) to tell the SLC firmware how many TDSs to use for multiplexing paths. This alias type is unique in that it is not used to route incoming calls. Instead, it is used by the CLC to generate transactions to the SLC.

03 Multiplexed only translation

This item is used to specify a simple alias translation that must be routed over a MUX (multiplexed) connection. The call will only connect if there is a multiplexed connection between associated SLCs. For more information on multiplexed connections, see Multiplexed Connections (MUXs) on page 7-19.

04 SLC routing translation

Use SLC routing translations to route calls through cards supporting non-time division sub channel (TDS) connections. As an example, this translation type must be used for the AI196I and the AI296.

Menu 8.14

Selecting this item will display menu 8.14 which enables you to enter Alias Macro strings and test the results for the Called address, Caller's address, Call data, Application-specific string, and the Alternate routing alias. This menu will display the macros entered in menu 8. Macros entered in this menu may be saved to update menu 8 or exit the menu without changing the macros.

Enter alias name, then select item 14. This screen displays the menu items available from Menu 8.14.

```
Macro strings:
02 Called address -
03 Caller's address -
04 Call data -
05 App. string -
06 Alternate routing alias -

Input strings:
09 Called address -
10 Caller's address -
11 Call data -

Result strings:
    Called address -
    Caller's address -
    Call data -
    App. string -
    Alternate routing alias -

20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Macro strings:

An alias macro string may be entered for each of these five items. For more information on alias macros, refer to Appendix C: Reading Alias Macros. The macro strings entered here will then be used by the system to process the data entered for the Input strings. The Result strings are then displayed below. Macro examples have been entered to illustrate the input and test results.

02 Called address

The macro for the Called address may be entered here. It has a character limit of 200, and may start with an equal sign (=).

03 Caller's address

The macro for the Caller's address may be entered here. It has a character limit of 200, and may start with an equal sign (=).

04 Call data

The macro for the Call data may be entered here. It has a character limit of 200, and may start with an equal sign (=).

05 App. strings

The macro for the App. strings may be entered here. It has a character limit of 200, and may start with an equal sign (=).

06 Alternate routing alias

The macro for the Alternate routing alias may be entered here. It has a character limit of 200, and may start with an equal sign (=).

Input strings

Specific input strings for the Called address, Caller's address and Call data may be entered in the three fields. The system will then use the Alias Macros entered above to process these strings and display the results. This allows you to test the macros and to be sure each of each string is properly processed for this alias.

09 Called address

Enter input called address for this alias. This is used only as data for testing. It has a character limit of 200.

10 Caller's address

Enter input caller's address for this alias. This is used only as data for testing. It has a character limit of 200.

11 Call data

Enter input call data string for this alias. This is used only as data for testing. It has a character limit of 200.

Result strings

Using the data entered for each macro string to process the data entered for each input string, the system then displays the results of the processing for this alias. If the results are not valid, an error message will be displayed in the field and you should change the macro strings to achieve the desired results.

```
Result strings:
    Called address -
    Caller's address -
    Call data -
    App. string -
    Alternate routing alias -
```

20 Save changes made

Select this menu item to save any changes made in Menu 8.14.

21 Exit this menu with no changes

Select this menu item to exit Menu 8.14. Any changes made will not be saved.

Commands from the AI Prompt

This chapter discusses the commands available from the AI prompt command line.

Guide to this Chapter

Conventions

The preface lists the conventions used to describe system manager commands syntax. This chapter uses these additional conventions

baseport	Replace this term with the valid baseport number of the card being affected.
port	Replace this term with a valid port number.
lport-hport	Enter a range of port numbers where: *lport* is the valid lower port number. *hport* is the higher port number.

Command Prompt

To use a command, log on to the system. (Methods of connecting to the AI180 are described in Accessing the AI180 on page 3-6 of Chapter 3: Introduction to System Configuration.) Enter commands at the > prompt.

A few commands do not require you to log in. Where so noted, these commands can also be used at the destination menu by prefacing the command with a period (.). The period differentiates the command from a destination selection. For example, enter the **clr** command on the destination menu like this:

```
.clr
```

Editing Command Lines Using Keys

The following keys (listed in Table 8-1) are used to edit command lines:

Table 8-1 Keys to Edit Command Lines

Key	Function
Up and Down arrow keys	Recalls previous commands that were issued on the AI198. The AI198 saves 20 different commands in its history per connection.
Left and Right arrow keys	Moves through the command you want to edit.
CTRL+k key	Removes all characters after the cursor.
CTRL+u key	Removes all characters before the cursor.
HOME key	Moves the cursor to the beginning of the line.
END key	Moves the cursor to the end of the line.
PAGE DOWN key	Moves the cursor to the last or current command.
PAGE UP key	Moves the cursor to the first command.
BACKSPACE key	Removes the character to the left of the cursor.
DEL key	Removes the current character.

Alphabetic Command Summary

Table 8-2 summarizes the commands for the AI198.

Table 8-2 AI198 winslc Commands

Command	Parameter(s)	Description
//	remark	Indicates that a remark follows.
account	**/a** *username pswd permprofname*	Allows you to add a new user, assign a password, and assign a permission profile to the user account database.
	/l	Lists the user accounts and their permission status.
	/d	Deletes a user account.
accountp	**/a** *new profile name existing profile name*	Allows you to add a permission profile.
	/e *existing profile name +/- command*	Allows you to edit or modify a permission profile.
	/d *existing profile name*	Deletes a permission profile.
	/l *profile name*	Lists the commands and users in a specific permission profile.
	/l	Lists the commands and users in all permission profiles.
	/n	List the names of all permission profiles.
active		Shows active TDS connections.
alrclr		Clears alarm levels.
alrset	*level*	Sets alarm levels.
alrsho		Shows the current alarm level.
blast	**[/i]** *message*	Sends a message out to all active or all asynchronous ports.
bnc		Sets the IP connector on the front panel.

Table 8-2 AI198 winslc Commands (Continued)

Command	Parameter(s)	Description
break	*port*	Terminates a connection.
	/b *ID*	Terminates a background connection.
	/s *ID*	Terminates a shell connection.
bye		Allows you to log out of AI180.
cfgmsg	*[n]*	Allows you to view system messages.
	n, **[{***message* **| default}]**	Replaces a system message with blank text, a different text message, or the default.
clcip		Allows you to view the IP parameters for the AI180.
clist		Lists functioning cards.
clr		Clears the alarm levels (login unnecessary).
clrals		Clears all SLC routing aliases from appearing on the SLC Destination Menu. This also will change any previous settings in Menu 8.5 from YES to NO.
clrtrap		Stops the CLC from sending the "faulted clc" trap.
clsoff	*destination*	Disables a class of service (destination) in EEPROM.
clson	*destination*	Enables a class of service (destination) in EEPROM.
commstr		Displays the AI198 read and write community names.
config	**menu, item=***value*...	Allows you to modify configuration without using the menu system.
cpycnf		Copies a configuration from active CLC to backup CLC.

Table 8-2 AI198 winslc Commands (Continued)

Command	Parameter(s)	Description
cpycrd	**cpycrd** *from_bp to_bp*	Copies a configuration from one baseport on a card to another baseport.
crdump	**crdump**	Displays the saved crash information.
	crdump/b	Shows the last crash of the backup CLC.
	crdump/c	Clears the active CLC crash dump information.
debug	**[***value***]**	Displays or sets DEBUG value.
	[{/a | /r} *value***]**	Allows you to add or remove control bits for debugging.
dep	*aaaa vv*	Allows you to write a 16-bit value to memory.
dhold		Shows all ports on hold (logging in unnecessary).
disabl	**[/c]** *port(s)*	Disables a smart line card, asynchronous port, or range of ports. This has no effect on the AI2524 or AI294.
dmpcfg		Outputs a stream of **config** commands which can be used to reconfigure the AI180.
dmpee		Outputs a stream of **restee** commands which can be used to reconfigure the AI180.
dmpslc	*baseport,aaaa*	Shows a piece of a smart line card internal memory.
dump		Causes the CLC to crash and generate a memory dump.

Table 8-2 AI198 winslc Commands (Continued)

Command	Parameter(s)	Description
dwnld	*/{x|y|z}*	Downloads software via an asynchronous or background connection.
	/a	Aborts a transfer in progress.
eb	**[/p]** *aaaa*	Examines a byte (display contents) of a memory address.
	/m	Examines the memory of the multiplexer.
eed	*aaaa vv*	Allows you to modify a byte of EEPROM memory.
	/s *symbol vv*	Allows you to modify a byte of EEPROM memory at a symbolic location.
eesize		Determines, reports, and sets configuration memory size.
enabl	**[/c]***port*	Enables a smart line card, an asynchronous port, or a range of ports. Resets the AI2524 and AI294.
	lport - hport	
ex	*aaaa*	Reads a 32-bit value from memory.
fast	*baseport,DNA,message*	Performs AI version of X.25 fast select.
flush		Clears high queue counters.
help		Shows a list of executable commands available according to the assigned permission profile.
inv		Obtains a list of boards in the switch and displays the Auto ID Database Report - Auto ID information.
inv/c		Obtains a list of AI2524 cards in the switch and displays the Auto ID Database Report - Cookie information.

Table 8-2 AI198 winslc Commands (Continued)

Command	Parameter(s)	Description
ioact		Shows the number of internal input/output buffers.
leds	**[***value***]**	Shows/changes the display function of the CLC LEDs.
lists	**[{/c | /k** *number***}]**	Shows/changes the state of internal strings (for Technical Support use only).
lo		Allows you to log out of AI180.
lock		Stops establishing new connections.
loglvl		Shows the current threshold severity level for messages.
	[*craft***], [***sholog***], [***caaml***]**	Allows you to set or change the values for the craft, SHOLOG, or CAAML port.
	/r	Resets the craft, SHOLOG, and CAAML levels to match the level set for the log port.
logoff		Allows you to log off the system.
logout		Allows you to log out of the AI180.
loop	*port*	Allows you to set an asynchronous port to loopback mode.
lstdsb		Lists disabled ports.
mcon	**[/i]** *xport yport*	Allows you to manually connect two specified ports.
menu		Accesses system configuration menus.
menuro		Accesses the menu as read-only.
netclr		Clears the X.25 network error counters.
netsta		Shows the X.25 network error counters.

Table 8-2 AI198 winslc Commands (Continued)

Command	Parameter(s)	Description
password	*oldpswd newpswd*	Allows you to change a password.
	oldpswd newpswd username	Allows supervisor access to change any user password.
pick	*port*	Allows you to pick up a call on hold.
plist		Shows all active ports.
prtdsc	*baseport*	Allows you to view a description for the AI194 ports.
pstat	*tdsn*	Shows port information.
repeat	*n delay command parameters*	Repeats a specified command from a dumb port only.
reset		Allows you to reboot the AI180.
restee	*address data* **...**	Allows you to write to configuration memory.
	/r *address count data*	
selcnf	**{/b | /c}**	Allows you to reboot the CLC.
send	*port*, *message*	Sends data to an asynchronous port.
shell		Shows the status of all Telnet sessions.
shobgc		Shows background connections.
shocls	**[/l] [***destination***]**	Shows status information for a destination.
sholog		Shows print log buffer.
shoprt	**[/l]** *port*	Shows the configuration of a port or range of ports.
	[/l] *lport-hport*	
slist		Shows port ranges of smart line cards.
stacls	**[/l] [***destination***]**	Shows status information for a destination.

Table 8-2 AI198 winslc Commands (Continued)

Command	Parameter(s)	Description
staeia	*port*	Shows information about port EIA signals.
staprt	**[/l]** *port(s)*	Shows the configuration of a port.
staslc	*baseport*	Shows the status report for a smart line card.
stat		Shows the status of the AI180.
states		Shows port states.
status		Shows CLC status information.
stpslc	*baseport*	Tells the smart line card to tear calls down and halt. This has no effect on the AI2524 and AI294.
swcpu		Switches to the backup CLC. Resets AI180.
telnet	**[***IP address* **[***port#***]]**	Initiates a Telnet session.
test	*port*	Tests an asynchronous port.
tftpstat		Determines how many configuration transfers have occurred between the AI180 and AI2524.
time		Shows the current time and date.
	*hh:mm***[***:ss***]** **[***mo/dd/ccyy***]**	Allows you to change the time or date.
tmract		Shows CLC software timer status.
tstini		Tests the integrity of the CLC reconfiguration strings.
unlock		Allows new connections to be made.
update		Shows current software version.
	{*sbank dbank***|/c** *bank***|/s|f** *baseport***}**	Updates current software versions.
watcpu		Shows which CPU is active.

Table 8-2 AI198 winslc Commands (Continued)

Command	Parameter(s)	Description
who		Shows who is logged into the AI180, when they logged in, what port they logged into, and the IP address of the shell session.
	/a	Lists the 50 most recent logins of the AIswitch including when they logged in, what port they logged into, and the IP address of the shell session.
winslc	*baseport command parameters*	Sends window transaction commands to smart line cards.
wndrct	*baseport n n ...* **[/s]**	Synthesizes CLC-to-smart line card and smart line card-to-CLC messages.

Note: The following sections describe the commands in more detail.

//

Indicates that a remark follows. The double slash at the beginning of a command line causes the system to ignore the remainder of the line. Use this command:

- To add readability in command files for use during configuration downloads
- In front of descriptive text that documents the purpose of other commands
- In front of legitimate commands to keep them from being executed.

Format

```
// remark
```

Parameter

remark	Indicates descriptive text.

account

These commands manage user accounts in the AI180. When you type **account**, a screen similar to this appears:

```
>ACCOUNT
ACCOUNT/A usrname pswd perm - to add account
ACCOUNT/D usrname           - to delete account
ACCOUNT/L                   - to list accounts
```

account/a

This command adds a new user account. If the **account** command displays the usage information, it indicates that the command was unsuccessful.

Format

account/a *username pswd perm*

Parameters

username	Indicates the username to add. The character limit is 120.
pswd	Indicates the password of the user. The character limit is 120.
perm	Indicates the name of the permission profile to use. Use the **accountp** command to add a new permission profile. The character limit is 120.

account/l

This command lists the configured user accounts and their permission statuses. When you type this command, a screen similar to this appears:

```
>ACCOUNT/L
User Account Database
RENEE with SUPERVISOR permission
LYNN with STATUS permission

NODE-XXX AISwitch craft port
>
```

account/d

This command deletes a user account. When you type this command, a screen similar to this appears:

```
>ACCOUNT/D LYNN
Account deleted.
NODE-XXX AISwitch craft port
```

Format

account/d *username*

Parameter

username Indicates the username of the account to delete.

accountp

This command adds, deletes, edits, and lists configured permission profiles.

```
>accountp

ACCOUNTP/A [new name] [existing name]
ACCOUNTP/D name
ACCOUNTP/E name [+-]command <[+-]command>
ACCOUNTP/L
ACCOUNTP/L name
ACCOUNTP/N
NODE-XXX AISwitch craft port
```

accountp/a

This command adds a new permission profile to the AI180. When you type this command, a screen similar to this appears:

```
>accountp/a profile1 status

Permission profile added
NODE-XXX AISwitch Shell Connection  8
```

Format

accountp/a *new profile name existing profile name*

Parameters

new profile name	Indicates the name of the profile being created. The profile character limit is 120.
existing profile name	Indicates the existing profile name.

A new permission profile is always based upon a default permission profile or an existing permission profile.

The following is a list of the existing default permission profiles:

- status
- mgmt
- supervisor
- ftp

The status, mgmt, and supervisor default permission profiles correspond to the permission levels that existed in the AI198 software versions 1.01 to 1.04. The ftp permission profile allows only a minimum set of login and logout commands.

The **accountp** command accepts one of these names or the name of a previously configured profile name for the *existing profile name* argument. The *new profile name* argument may not be status, mgmt, supervisor, ftp, or the name of an existing command profile. Successfully executing this command creates a new permission profile which may then be modified by using the **accountp/e** command.

Users are added with one of four permission profiles which govern the commands they are allowed to execute. Refer to Account Profiles and User Account Security on page 3-11 of Chapter 3: Introduction to System Configuration for a list of commands for each profile.

accountp/e

This command edits or modifies a permission profile. When you edit a permission profile, a command is added or deleted from the profile. Use the *+* operator to add a command to the profile. Use the - operator to delete a command from the profile.

When a command is contained within a profile, it may be executed by a user assigned to the command profile. Multiple edits may be executed on the same command line by repeating this command. When you type this command, a screen similar to this appears:

```
>accountp/e profile -dump +who

PROFILE permission profile modified
NODE-XXX AISwitch craft port
```

Format

accountp/e *existing profile name +/- command*

Parameters

existing profile name	Indicates the name of an existing profile.
+/- command	Adds or deletes a command to or from a profile.

accountp/d

This command deletes a permission profile. If any users are assigned to the permission profile you want to delete, a list of those users will be printed. If any of these users login to the AI180, their permission profile will default to the status profile.

Note: You cannot delete the default profiles.

When you type this command, a screen similar to this appears:

```
>accountp/e profile -dump +who

PROFILE permission profile modified
NODE-XXX AISwitch craft port
```

Format

accountp/d *existing profile name*

Parameter

existing profile name	Indicates the name of the profile to delete.

accountp/l profile name

This command lists the commands and users in a specified permission profile. You may specify a particular permission profile to list only those commands and users associated with that particular profile. When you type this command, a screen similar to this appears:

```
>accountp/l profile1

Permission Profile: PROFILE1
User List:
Commands:
ACTIVE     ALRSHO     BLAST      BYE        CLIST
DHOLD      DMPCFG     DMPEE      EB         EX
HELP       INV        IOACT      LISTS      LO
LOGOFF     LOGOUT     LSTDSB     MENURO     NETSTA
PASSWORD   PLIST      REPEAT     SHELL      SHOBGC
SHOCLS     SHOLOG     SHOPRT     SLIST      STACLS
STAEIA     STAPRT     STASLC     STATES     STATUS
TFTPSTAT   TMRACT     TSTINI     WATCPU
NODE-XXX AISwitch Shell Connection  1
```

Format

accountp/l *profile name*

Parameters

profile name	Indicates the name of a profile to list.

accountp/l

This command lists the commands and users in all configured permission profiles.

accountp/n

This command lists the names of all permission profiles.

When you type this command, a screen similar to this appears:

```
>accountp/n
Permission Profile Names:
STATUS       MGMT         SUPERVISOR     WONG           TEST1
T            TT           PROFILE1
NODE-XXX AISwitch Shell Connection  8
```

active

This command displays a list of all active connections in the AI180. Each item in the list shows two connected port numbers separated by a dash (-).

If no connections are active, this message is printed:

```
000 CONNECTION(S) ACTIVE
```

alrclr

This command sets the alarm condition to 0.

alrset

This command sets an alarm level to the value specified.

Format

alrset *level*

Parameter

level	Indicates an integer between 0 and 9.

alrsho

This command views the current alarm level. The alarm level is set by the last **alrset** or **alrclr** command or by an event.

blast

This command sends a specified message to all the ports on the system that are not actively online. The message will not be sent to:

- Ports that are actively online (unless **/i** is used)
- Any port whose baud rate is not currently set
- Any destination port.

Format

blast[/i] *message*

Parameters

/i	Sends a message to ports which are actively connected.
message	Indicates the message you want to send to all ports on the system.

bnc

This command enables or disables the IP connector on the front panel of the CLC.

Format

```
bnc on
bnc off
```

Parameters

`on`	Enables the IP connector.
`off`	Disables the IP connector.

break

This command terminates a connection. There are three forms of the command: break port#, break/b id, and break/s id.

break port#

This command finds and breaks any connection to the specified port number. This command operates without regard to the current activity on the port so use it with caution. It should never be used to terminate interface-to-smart line card connections.

Format

break *port#*

Parameter

port#	Specifies the port number that you wish to disconnect.

break/b id

This command disconnects background connections.

Format

break/b *ID*

Parameter

ID	Indicates the background connection ID number.

break/s id

This command terminates a shell connection.

Format

break/s *ID*

Parameters

ID	Indicates the shell ID number.

bye

This command causes the AI180 to log off of the system manager destination. The next user of your terminal will be asked to select a destination.

Note: For security reasons, this command should be used whenever the terminal is unattended.

These commands perform the same function: lo, logoff, and logout.

cfgmsg

This command changes or views configurable system messages.This command allows customization of common end user messages.

If no arguments are entered, the current list of messages appears. This shows the default alterable messages displayed by the **cfgmsg** command:

```
>cfgmsg
000 Welcome To AISwitch<13><10>
001 <13><10>Enter destination name<13><10>>
002 <13><10><7><7>*CONNECTING NOW*<13><10>
003 <13><10>*CONNECTION TERMINATED*<13><10>
004 <13><10>Enter <<CR> to connect >
005 <13><10>Valid destinations are as follows:<13><10><10>
006 ?Sorry, this destination is out of service<13><10>
007 ?Sorry, no ports in this destination are available<13><10>
008 Do you wish to wait (Y/N) ?
009 <13><10>* Disconnect with <<CR> or H<<CR> to hold Call >
010 Enter AISwitch password<13><10>>
011 ?Unknown destination<13><10>
012 ?Sorry, this destination has no ports currently<13><10>
013 ?Sorry, the baud rate does not match<13><10>
014 <13>?Sorry, incorrect password<13><10>
015 ?Sorry, that destination is restricted<13><10>
016 ?Requested destination does not answer, Try again<13><10>>
017 Enter network DNA and remote AISwitch route <13><10>>
```

cfgmsg n

This shows a specific message.

Format

cfgmsg *n*

Parameter

n	Specifies the message number to appear.

cfgmsg n,message

This changes a message. For rules on using ASCII codes in messages, see Appendix A: ASCII Codes.

Format

cfgmsg *n*,*message*

Parameters

n	Specifies the number of the message to change.
message	Specifies the new message string. The maximum character limit is 59.

cfgmsg n,

This command deletes the specified message number. This command blanks out message *n*, in effect, deleting it.

Format

cfgmsg *n*,

Parameter

n	Specifies the number of the message to delete.

cfgmsg n,[default]

This command restores the specified message to its default.

Format

cfgmsg *n*, **[default]**

Parameters

n	Specifies the number of the message to restore.
default	Restores the default message.

clcip

This command views the IP parameters for the AI198.

To change the IP parameters, see Network Parameters on page 4-21.

clist

This displays a list of cards configured for the AIswitch complete with the starting port number, the number of ports, and the card type.

Table 8-3 Card Types

Card	Type
AI183/AI185	DUMB
AI192/AI196-X	X25
AI192/AI196-X with full menu support	X25M
AI193/AI194	ETHER
AI2524	AI2524
AI294	AI294
AI196-I with full menu support	AI196I
AI296 with full menu support	AI296
Independent smart line card	ISLC
AI232	AI232
AI Modem	AI070
AIFLEX	AIFLX
AIfocus	FOCUS
AIwan E1	WANE1
AIwan T1	WANT1

Example Report

```
>clist
Start   Size    Type
0       16      X25
16      16      X25
48      16      ETHER
64      16      ETHER
80      16      ETHER
96      16      AI294
```

clr

This clears all minor and major alarms that occur in the switch for any reason. This command disables the alarms.

clrals

This command sets the existing SLC routing aliases so that they do not appear on the SLC Destination Menu. This command is a default command in the command set used for accounts with supervisor and management privileges.

Format

```
clrals
```

Note: There is no system response when you issue this command. However, after issuing this command, the next time you log on to an SLC, you will not see any SLC routing aliases on the SLC Destination Menu.

clrtrap

This command stops the CLC from sending the "faulted clc" trap which is configured in Menu 1.18.

Format

```
clrtrap
```

clsoff

This command turns off a destination that is currently enabled.

Format

clsoff *destination*

Parameter

destination	Specifies the name of any destination that you have configured in your system.

clson

This command turns on a destination that has been turned off with the **clsoff** command.

Format

clson *destination*

Parameter

destination	Specifies the name of any destination that you have configured in your system.

commstr

This command views the AI198 read and write community names. Community names are used to get and set variables through SNMP.

Example Report

```
>commstr
Default Read Community String: public
Configured Write Community String: admin
```

config

This command modifies AI180 configuration without using the menu system. For a detailed explanation of this command and a listing of keywords, see Appendix B: The config Command.

Format

config *menu item value* **...**

Parameters

menu	Specifies a configuration menu.
item	Specifies the keyword of a menu item to configure.
value	Specifies the value to select for that menu item.

Note: Disconnect the switch from the network if a large number of CONFIG commands are executed.

Note: Do not upload multiple CONFIG commands while the SLC is enabled.

cpycnf

This command copies the system configuration (including CLC IP address, router address, and subnet mask) from the active CLC to the backup CLC. (To verify which CLC is currently running, use the watcpu command.)

cpycnf takes several minutes to complete and prints a message upon successful transfer of the configuration. The status of the copy process appears on the port that initiated the command. The AI180 continues to process calls during this process.

cpycrd

This command copies a card configuration from a card at one baseport (called the *from* baseport) to a card at another baseport (the *to* baseport). This command also copies the boot block if the card is a smart line card. The AI180 continues to process calls while the **cpycrd** command is executing.

You must first use the **stpslc** and **disabl/c** commands to disable the card in the *to* baseport before executing the **cpycrd** command. Otherwise the CLC displays an error and aborts the command. Also, this command cannot copy from, and will not copy to, an expansion slot. You cannot execute the **cpycrd** command if any menu is currently opened.

Format

cpycrd *from_bp to_bp*

Parameters

from_bp	Indicates the baseport of the card whose configuration will be copied to the card at *to_bp*.
to_bp	Indicates the baseport of the card whose configuration will be replaced with a copy from the card at *from_bp*.

Note: Once a configuration has been successfully copied, you must reconfigure any unique parameters for the card at *to_bp* (such as the IP address, primary and secondary router IPs, subnet mask, destination name(s), and expansion slots). Then use **enabl/c** to enable the card at *to_bp*.

crdump

This command Views or clears saved crash information. When a CLC crashes, the CLC will save its crash information. The crash information can be viewed or deleted using this command.

Format

crdump	Displays the saved crash information.
crdump/b	Shows the last crash of the backup CLC.
crdump/c	Clears the active CLC crash dump information.

debug

This command sets, adds, or removes control bits which cause specific debugging data to be logged or not logged.

CAUTION: This command is used to isolate system faults and should be used only by qualified Technical Support. Use of this command can cause regenerative CAAML connections.

If no arguments are entered, the current DEBUG values appear. Several optional arguments allow you to filter the output of the DEBUG command. See Filtering Debug Output for more information.

debug value

This command sets the DEBUG value.

Format

debug *value*

Parameter

value Sets DEBUG value. See the hexadecimal bit values shown in Table 8-4 on page 8-42. The previous value is overwritten.

debug/a value

This command adds flags.

Format

debug/a *value*

Parameter

value Sets flags to the specified hexadecimal value. All previously activated bits will remain set.

debug/r value

This command removes flags.

Format

debug/r *value*

Parameter

value Removes flags from the specified hexadecimal value.

The hexadecimal bit values shown in Table 8-4, listed along with their results, are available for the *value* argument.

Table 8-4 Hexadecimal Bit Values for DEBUG Value Argument

Value	Result
1	Be verbose about window transactions.
2	Log incoming window transactions.
4	Log outgoing window transactions.
8	Parse unified transactions when logging.
10	Log entire messages.
20	Don't show message body for any transaction.
40	Don't show the SNMP_PDU transaction.
80	Log alias translation calculations.
100	Print the string "<EOL>\r\n" at the end of every SLC-generated log transaction.
200	Generate a long crash dump.
400	Make SLC read-only. Sent in MST_RDY.
800	Enable dprintf output.
1000	Display IPC transactions.
2000	Display state change information.
4000	Don't show the LOG transaction from the SLC.
8000	Don't show the BOOT transaction from the CLC.

Normally, the DEBUG command produces a great deal of output, which often makes it difficult to find information about a specific link or port. To make it easier to see specific information, the DEBUG command supports two optional arguments after the value argument to filter the output:

debug *value ports filtered_links*

Parameters

value	Sets DEBUG value. See the hexadecimal bit values shown in Table 8-4 on page 8-42. The previous value is overwritten.
ports	Specifies a single port, a group of ports, or a contiguous range of ports. Only ports specified in this argument will be included in DEBUG output; all other port diagnostic messages will be suppressed.
filtered_links	Specifies a single link, a group of links, or a contiguous range of links. Only links specified in this argument will be excluded in DEBUG output; all other link diagnostic messages will be included.

Port Filtering Examples

There are three options for specifying the port or ports to include in DEBUG output. See Table 8-5 for examples.

- Single port: type the port number after the value argument.
- Multiple ports: type each number separated by a space. The port numbers do not have to be contiguous.
- Port range: for a contiguous range of ports, enter the lowest port number, a hyphen, and then the highest port number.

Table 8-5 Filtering Ports

Port(s)	Example	Description
single	DEBUG 8F 32	DEBUG messages are displayed for port 32 only.
multiple	DEBUG 8F 32 80 128	DEBUG messages are displayed for ports 32, 80, and 128 only.
range	DEBUG 8F 32-80	DEBUG messages are displayed for all ports from 32 to 80, inclusive.

Link Filtering Examples

Although the three options for specifying the link or links are similar to those for ports, the effect is exactly the opposite: DEBUG messages are not included for links specified in the filtering option. See Table 8-6 on page 8-44 for examples.

All link number specifications must begin with L, and must be entered after the port specification. Your choices are:

- Single link: type the link number (with L) after the port argument.
- Multiple links: type each number (with L) separated by a space. The link numbers do not have to be contiguous.
- Link range: for a contiguous range of links, enter the lowest link number (with L), a hyphen, and then the highest link number (without L). The highest link number is 32.

Table 8-6 Filtering Links

Link(s)	**Example**	**Description**
single	DEBUG 8F 32 L2	DEBUG messages are displayed for all links on port 32 except for link 2.
multiple	DEBUG 8F 32 L1 L3	DEBUG messages are displayed for all links on port 32 except for links 1 and 3.
range	DEBUG 8F 32 L4-10	DEBUG messages are displayed for all links on port 32 except for links 4 through 10, inclusive. Note that the high link number does not require L, only the low link number.

dep

This command writes a 16-bit value to memory. You can also use this command to modify memory locations.

Note: This command is used to isolate system faults and should be used only by Technical Support.

Format

dep *aaaa vv*

Parameters

aaaa	Indicates the four-character hexadecimal memory address.
vv	Indicates the two-character hexadecimal value to place.

dhold

This command displays a list of all ports which are on hold for the system as a whole. A list appears with the held port destination name and port owner.

A user login is not required to execute this command. Enter it at the destination menu by prefacing the command with a period (.).

Format

```
.dhold
```

disabl

This command disables a smart line card, asynchronous port, or a range of ports. This command automatically executes the **stpslc** command when it is used on smart line cards. See the **stpslc** command for more information.

CAUTION: System integrity cannot be maintained if you remove a card containing a port which the system firmware considers to be online.

When a port on an asynchronous card is disabled, the AI180 turns the port off and removes the port number from the online table. All subsequent connections to the specified port will be denied.

This command will prompt for verification when entered. Type **Y** to continue with the command, or **N** to abort.

Format

disabl[/c]{* | *port* | *lport*-*hport*}

Parameters

/c	Signifies that all ports on the card specified by the port number should be disabled.
*****	Indicates an optional wildcard that allows you to disable only certain cards. It will only disable a card that has menu item 4.5 enabled. If a port, if then only a port that has menu item 4.2.2.15 enabled.
port	Indicates the number of the port to disable. If the baseport of a smart line card is disabled, then the entire card and subsequent connections to the card will not be accepted.
lport	Indicates the low port value of the range of ports to disable.
hport	Indicates the high port value of the range of ports to disable.

dmpcfg

This command dumps a copy of the AI180 system configuration to the port issuing the command. The output stream represents a list of **config** commands which could be used to reconfigure the AI180.

Note: Do not use the **dmpcfg** command to create a configuration backup if you are using SNMP. Not all SNMP configurable fields will be saved. The **dmpcfg** command also does not save the user account database or AI196-I configurations.

Checksums

When executing the **dmpcfg** command, the CLC generates a checksum value for each configuration line in the report.

The checksum is an important error checking device used during system configuration. It assures that the system configuration data captured has not been corrupted at any point between the backup and the restore operations.

The checksum is determined by adding the ASCII value of each character in the command string, starting with the **+** and ending before the **$**. The checksum value is appended to the end of the command line as a four-character hexadecimal number following the **$**.

Here are examples of DMPCFG lines that include a hexadecimal checksum:

```
+CONFIG CARD,BPORT=16,DST=XDOT32,DESC=<0>,RESET=ON$0D25
+CONFIG CARD,BPORT=32,DST=,DESC=<0>,RESET=ON$0B7F
+CONFIG CARD,BPORT=48,DST=ETH32,DESC=<0>,RESET=ON$0CCC
```

When restoring these configuration lines, the recorded checksum must match a newly calculated checksum. If the checksums match, the command will be executed. If they do not, the command will not be executed, and an error message will be logged.

Menu Sequence

In the DMPCFG report which follows, note that each section refers to a specific configuration menu. This allows you to review and note the configuration settings.

Also note that DMPCFG report does not list the menus in numerical order. This is because a restoration of the system configuration must proceed in a specific order. This is not the same order in which the system menus are found.

The correct menu configuration sequence is 1, 2, 7, 4, 5, 8.

The default example does not contain entries for all menu items.

dmpee

This command dumps a copy of the AI180 configuration to the port issuing the command. Typing this command generates text containing configuration restoration commands.

Note: This command is used to isolate system faults and should be used only by Technical Support.

dmpee is used as a backup utility. For more information, see Chapter 6: Downloading Software and Configurations.

dmpslc

This command shows a piece of the smart line card internal memory.

CAUTION: This command is used to isolate system faults and should be used only by Technical Support. Improper use can crash the smart line card.

Format

dmpslc *baseport*,*aaaa*

Parameters

baseport	Indicates the baseport number of the target smart line card.
aaaa	Indicates the four-character hexadecimal memory address where the dump should be started. The dump will appear only on the log port.

dump

This command causes the CLC to crash and generate a memory dump.

CAUTION: This command is used to isolate system faults and should be used only by the direction of Technical Support. All call processing will stop, and all connections will be lost as a result of this command.

The memory dump is sent to the craft port. The port which receives the dump should be configured to use XOFF/XON protocol to slow reception of the dump. If the log terminal is configured and activated, the dump appears there as well. The following message appears to verify that a dump has been requested.

```
Are you sure you want to proceed? (Y/N) >
```

Enter **y** to continue, or **n** to abort the command.

At the completion of the dump, all activity on the AI180 stops, and the system fault light illuminates.

To generate a more detailed memory dump, use the **debug** command before performing the dump.

Press CTRL+c to abort the dump.

dwnld

This command downloads CLC or smart line card software images via an asynchronous or background connection. See Chapter 6: Downloading Software and Configurations for a description of this process.

Format

dwnld/*protocol*

Parameters

protocol Indicates a one-letter value depending on which method your terminal emulation program uses.

The protocol values and their terminal emulation methods are:

- **a** Aborts a transfer in progress
- **x** Xmodem or Xmodem/1 kilobyte
- **y** Ymodem or Ymodem Batch
- **z** Zmodem

eb

This command examines a byte of memory.

Note: This command is used to isolate system faults and should be used only by the direction of Technical Support.

eb[/p] aaaa

This command displays the contents of a memory address. A screen similar to this appears:

```
>eb/p 0
00000000 13 00 00 00 00 00 00 11 00 00 00 00 00 00 17 0E
00000010 00 21 17 18 00 21 17 22 00 21 17 2C 00 21 17 36
00000020 00 21 17 40 00 21 17 4A 00 21 16 C6 00 21 16 C6
00000030 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
00000040 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
00000050 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
00000060 00 20 2B AE 00 21 E0 8E 00 23 87 46 00 21 16 C6
00000070 00 21 16 C6 00 23 87 46 00 20 2B A4 00 21 16 C6
00000080 00 21 17 52 00 21 16 C6 00 21 16 C6 00 21 16 C6
00000090 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
000000A0 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 2B 2C 44
000000B0 00 2B 2C 48 00 2B 2C 4C 00 21 16 C6 00 21 16 C6
000000C0 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
000000D0 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
000000E0 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
000000F0 00 21 16 C6 00 21 16 C6 00 21 16 C6 00 21 16 C6
```

Format

eb [/p] *aaaa*

Parameters

/p	Displays one page of memory starting at address *aaaa*.
aaaa	Specifies a hexadecimal address in the system. The contents of this memory byte will be displayed in hexadecimal.

eb/m

This command examines the memory of the multiplexer. A screen similar to this appears:

```
>eb/m
000>CLC 001>CLC 002>CLC 003>CLC 016>CLC 017>CLC 018>CLC 019>CLC 020>CLC 021>CLC
022>CLC 023>CLC 024>CLC 025>CLC 026>CLC 027>CLC 028>CLC 029>CLC 030>CLC 031>CLC
032>CLC 033>CLC 034>CLC 035>CLC 036>CLC 037>CLC 038>CLC 039>CLC 040>CLC 041>CLC
042>CLC 043>CLC 044>CLC 045>CLC 046>CLC 047>CLC 064>CLC 065>CLC 066>CLC 067>CLC
```

eed

This command modifies a byte of EEPROM memory. This command has two forms which place a data value in either a hexadecimal or symbolic memory location.

Note: This command is used to isolate system faults and should be used only by Technical Support.

eed aaaa vv

This command places a data value in the EEPROM memory.

Format

eed *aaaa vv*

Parameters

aaaa	Indicates a hexadecimal EEPROM memory location.
vv	Indicates a hexadecimal byte of data to be written into the location.

eed/s msglvl vv

This command places a data value in EEPROM memory.

Format

eed/s *msglvl vv*

Parameters

/s	Indicates that the symbolic location (rather than the exact hexadecimal EEPROM memory location) is used.
msglvl	Specifies that the message-level byte is the write target.
vv	Indicates a hexadecimal byte of data to be written into the location.

The MSGLVL is a byte of memory that specifies what events and conditions are logged when logging is enabled. Valid hexadecimal bye settings are described in following table (Table 8-7).

Table 8-7 Valid Hexadecimal Bye Settings

Hex Byte	Description
0	Log all menu level commands.
1	Log tty I/O activity.
3	Log use of ENABL command.
4	Log all timeouts.
5	Log all incoming window transactions from any SLC.
6	Log all outgoing window transactions to any SLC.
7	Inhibit time stamp on log messages.

eesize

This command determines, reports, and sets configuration memory size.

`eesize` determines the amount of EEPROM available, sets the central AI180 to use this amount, and reports the EEPROM size in bytes.

enabl

This command enables a smart line card, asynchronous port, or range of ports.

This command turns on a port or range of ports which have been turned off with the disabl command.

If a specified port fails diagnostic tests when an attempt is made to place it online, an error message appears, and the port is not enabled. If a range is specified, each port is passed or failed independently.

You can use the **enabl** command to reset the AI2524 or AI294. When you type **enabl**, the system displays a list of the cards that will be reset, and displays the following prompt:

```
Are you sure you want to proceed? (Y/N)
```

When you type **Y**, the system displays:

```
The card appears to have booted
```

Note: When you use the **enable** command to reset an AI2524, the fault light on the AI2524 appears for at least 60 seconds before the card reboots.

Format

enabl[/c]{* | *port* | *lport*-*hport*}

Parameters

/c	Signifies that all ports on the card specified by the port number should be enabled. Note that this only works for asynchronous cards.
*****	Indicates an optional wildcard that allows you to enable only certain cards. The **enabl *** command will only reset a card if that card has menu item 4.5 enabled, or a port if that port has menu item 4.2.2.15 enabled.
port	Indicates the number of the port to be enabled. If it is the baseport of a smart line card, the entire card is enabled and subsequent connections to the smart line card will be accepted.
lport	Indicates the low port of the range of ports to enable.
hport	Indicates the high port of the range of ports to enable.

ex

This command reads a 32-bit value from memory. The contents of this memory word are displayed in hexadecimal.

Note: This command is used to isolate system faults and should be used only by the direction of Technical Support.

Format

ex *aaaa*

Parameter

aaaa	Indicates the word location specified as a four-character hexadecimal address.

fast

This command performs the AI version of X.25 fast select. The **fast** command sends a fast select message via an X.25 network module. This could cause data to be output on another AI180.

Format

fast *baseport*,*DNA*,*message*

Parameters

baseport	Indicates the baseport of the X.25 smart line card uses as a gateway.
DNA	Indicates the network address of the message destination.
message	Indicates the message to transmit. The message may have up to 128 characters.

flush

This command resets the high queue counters kept for all destinations. These counters track the highest number of ports that have concurrently waited for a specific destination. They are useful for optimizing the number of ports allocated to each destination. This command can be used to reset these counters to allow the length of the wait for a destination to be measured.

help

This command Lists only those commands that the user may execute according to the assigned command permission profile. When you type this command, a screen similar to this appears:

```
>help
Valid commands are:
ACCOUNT         ACCOUNTP        ACTIVE          ALRCLR          ALRSET
ALRSHO          BLAST           BNC             BREAK           BYE
CFGMSG          CLCIP           CLIST           CLR             CLRALS
CLRTRAP         CLSOFF          CLSON           COMMSTR         CONFIG
CPYCNF          CPYCRD          CRDUMP          DEBUG           DEP
DHOLD           DISABL          DMPCFG          DMPEE           DMPSLC
DUMP            DWNLD           EB              EED             EESIZE
ENABL           EX              FAST            FLUSH           *FTPLOGIN
HELP            INV             IOACT           LEDS            LISTS
LO              LOCK            LOGLVL          LOGOFF          LOGOUT
LOOP            LSTDSB          MCON            MENU            MENURO
NETCLR          NETSTA          PASSWORD        PICK            PLIST
PRTDSC          PSTAT           REPEAT          RESET           RESTEE
SELCNF          SEND            SHELL           SHOBGC          SHOCLS
SHOLOG          SHOPRT          *SLCLOGIN       SLIST
STACLS          STAEIA          STAPRT          STASLC          STAT
STATES          STATUS          STPSLC          SWCPU           TELNET
TEST            TFTPSTAT        TIME            TMRACT          *TNLOGIN
TSTINI          UNLOCK          UPDATE          WATCPU          WHO
WINSLC          WNDRCT
NODE-XXX AISwitch craft port
```

Note: Note that the asterisk (*) located before some of these commands denotes that they are functions and not commands. These functions can be either enabled or disabled for a particular account. For example, you may want to set up an account that does not allow logins via Telnet or FTP. In this case, you would remove the Telnet and FTP commands for the particular account profile being configured. Any user assigned to use the particular account profile would not have the ability to log in via Telnet or FTP.

inv

This command obtains a list of cards in the switch. The cards must support an Auto ID device to appear on the list.

When you use this command, the Auto ID Database Report Auto ID Info appears. A report similar to this appears:

Example Report

```
:Auto ID Database Report - Auto ID Info
Uninitialized Auto ID devices found
Product         Serial#      MfgDate   MACAdrs            Description
--------------  -----------  --------  -----------------  ----------------
198C.04A        19802027     12/10/96  00:40:72:00:41:6f  Active 198
AI212.2         21200016     08/22/97  00:40:72:ff:ff:ff  Baseport 0
AI294.4         29400053     11/24/97  00:40:72:00:63:c2  Baseport 0
RDC180HP.B      18000449     01/13/97  00:40:72:ff:ff:ff

NODE-XXX AISwitch Shell Connection  5
>
```

The Description field contents vary based on the cards identified. Table 8-8 is an example cross-reference between card type and Description field meaning:

Table 8-8 Card Type and Field Meaning

Product	Description Field Meaning
198C.04A	Identifies the active or backup CLC.
AI212.2	Identifies the smart line card associated with the AI294 at baseport 0.
AI294.4	Identifies the card type at the specified baseport.
RDC180HP.B	Identifies the active power supply.

Table 8-9 defines and describes the interfaces you will see on the Auto ID Database Report. The interfaces here are all associated with the AI294.

Table 8-9 Interface Descriptions Associated with the AI294

Interface	Description
AI211	10Base2 interface
AI212	10BaseT interface
AI213	Fiber optic interface

inv/c

This command obtains a list of AI2524 specific card information. When you use this command, the Auto ID Database Report Cookie Info appears. A report similar to this appears:

Example Report

```
Auto ID Database Report - Cookie Info
AI2524 at Baseport 32
Interface Type: 0x1b
Vendor: 0x01
MAC Address: 00:40:72:00:49:1a
Processor: 0x06
HW Rework: 0x00000000
Serial: 52400177
Magic: 0x0000
Capabilities: 0x0000
Version: 0x00
```

ioact

This command provides a list of all TDSNs that are using AI180 buffers. These ports are the ones that are actively communicating with the CLC at the menu level. The command tells how many input/output buffers are allocated to receive (RXBC) and transmit (TXBC) for each active TDSN.

Use this command to determine if there are any devices randomly chattering to the CLC. If the command is used on an idle system, investigate any TDSNs with input/output buffers allocated. The system will always show input/output activity for the TDSN requesting the **`ioact`** command.

leds

This command shows/changes the display function of the CLC LEDs. The **LOAD** LEDs on the faceplate of the CLC are capable of displaying 16 different types of diagnostic information. This command allows you to select which virtual display is being shown.

Note: This command and the display are intended for use only by Technical Support.

Using the **leds** command with no argument shows the current setting and provides a remote display of the LEDs. In this screen example, the periods (.) represent an unlit LED and O represents a lit LED.

```
>leds
Current LED display group: 0

   t
   o
   p6543210
00 .....OOO performance
01 ........
02 ........
03 ........
04 ........
05 ........
06 ........
07 ........
08 ........
09 ........
10 ........
11 ........
12 ........
13 ........
14 ........
15 ...O.O.O Current TDS
```

Format

leds [*value***]**

Parameters

Currently, only two displays are available through the value argument. These are the values and descriptions of those virtual displays.

00	Indicates used to graph the relative loading of the AI180. This is the default upon system start.
15	Indicates used to show current window/TDS being scanned by the CLC.

lists

This command shows/changes the state of internal strings.

Note: This command is used to test the system and should be used only by the direction of Technical Support.

Format

`lists {/c | /k` *`port#`***`}`**

Parameters

`/c`	Clears the lists of ports queued, ports entering routing information, and ports with an alternate alias.
`/k` *`port#`*	Removes a single port from one or more of the above lists.

lo

This command causes the AI180 to log off of the system manager destination. The next user of your terminal will be asked to select a destination.

Note: For security reasons, use this command whenever the terminal is unattended.

These commands perform the same function: bye, lo, logoff, and logout.

lock

This command allows the system manager to lock the TDM bus so that no new users may be connected. This command does not affect any currently connected users.

To release the lock, use the unlock command.

loglvl

This command shows or changes the log message threshold for three of the four log destinations. If the severity level of an output message is equal to or higher than the level set by this command, the message appears on the destination.

loglvl

This command displays the current values:

```
>loglvl
Current log threshold levels:
craft    = follows log port
SHOLOG   = follows log port
CAAML    = follows log port
log port = 1
```

loglvl craft[,sholog[,caaml]]

This command sets or changes the values for the craft, SHOLOG, or CAAML port. Enter the desired values in the arguments in the order shown. Separate the arguments with commas.

To change the SHOLOG or CAAML value only, use commas as placeholders. For example, to change the CAAML log value to 6, type this command:

```
loglvl ,,6
```

Format

loglvl *craft*[,*sholog*[,*caaml*]]

Parameters

craft	Allows you to change the values set for the craft port.
sholog	Allows you to change the values set for the sholog port.
caaml	Allows you to change the values set for the caaml port.

loglvl/r

This command resets the craft, SHOLOG, and CAAML levels to match the level set for the log port.

logoff

This command causes the AI180 to log off of the system manager destination. The next user of your terminal will be asked to select a destination.

Note: For security reasons, use this command whenever the terminal is unattended.

These commands perform the same function: bye, lo, logoff, and logout.

logout

This command causes the AI180 to log off of the system manager destination. The next user of your terminal will be asked to select a destination. For security reasons, this command should be used whenever the terminal is unattended.

These commands perform the same function: bye, lo, logoff, and logout.

loop

This command tests the terminal-to-port-card wiring. The specified port number is placed into a remote loopback condition. This loops the transmit data to the receive data inside the smart line card. A properly connected port will echo any characters sent to it.

Looping a port and typing on a terminal connected to that port will create an echo of the characters typed. Half-duplex terminals will display each typed character twice.

The port will be disabled by this command and will not be usable until it is placed back online.

See other commands: lstdsb, enabl, disabl, and test.

Format

loop *port*

Parameter

port	Indicates the asynchronous port you want to set to loopback mode.

lstdsb

This command lists disabled ports.

This helps to determine the current online/offline state of ports.

```
>lstdsb
000 001 002 003 004 005 006 007 008 009 010 011 012 013 014 015
016 017 018 019 020 021 022 023 024 025 026 027 028 029 030 031
032 033 034 035 036 037 038 039 040 041 042 043 044 045 046 047
048 049 050 051 052 053 054 055 056 057 058 059 060 061 062 063
080 081 082 083 084 085 086 087 088 089 090 091 092 093 094 095

NODE-XXX AISwitch Shell Connection  15
```

mcon

This command tests ports and for makes temporary connections in the AI180. Those ports must be:

- Online
- Not currently connected
- Set to the same baud rate.

The AI180 maintains the connection until one of these occurs:

- The connection is broken for normal disconnection reasons as set for either port in the permanent system configuration.
- The system is turned off and then on again.
- The BOOT button is pressed.
- A **`break`** command is given.

Connecting ports of different baud rates with the optional **`/i`** switch is called downspeeding. To allow terminals of different rates to communicate without loss of data, the host side of the system (or any side which can send continually) must be of a slower rate than the (keyboard-based) terminal. This downspeeding feature does not buffer any characters.

If one of the ports you are connecting is currently connected to the user login, the call is placed, and the AI login is disconnected. When you terminate the call, you will receive this message and will be disconnected:

```
*CONNECTION TERMINATED*
```

If neither of the ports you are connecting is your current port, no call termination message is printed for either port.

Format

`mcon[/i]` *`xport yport`*

Parameters

`/i`	Indicates an optional switch that allows you to connect ports of different baud rates.
`xport`	Indicates the originating (calling) port.
`yport`	Indicates the destination (called) port.

menu

This command allows you to access the system configuration menus. Enter the **menu** command after establishing a user login. The Main Menu appears.

```
>menu
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries









21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key
```

For more information, see Chapter 3: Introduction to System Configuration and Chapter 4: System Configuration by Menu.

menuro

This command accesses the menu as read-only. When you type this command, this menu appears:

```
>menuro
                                                                    Main Menu
01+Configure options affecting the system as a whole
02+Create, delete, or modify a destination name
03+Display all destination names
04+Configure cards
05+Set or remove connection restrictions based on port numbers
06+Display all connection restrictions
07+Configure slot density
08+Configure the alias translation table
09+Display the list of alias translation entries
.
.
.
21 Exit the configuration menu system
Enter item number and optional ",value" then push <CR> key>
```

Note: You cannot save changes when the menu is invoked using this command.

netclr

This command clears the X.25 network error counters.

Counters are kept by the CLC for X.25 and Ethernet network status information. The counters can be reset to zero with this command.

netsta

This command displays the X.25 and Ethernet network status information kept by the CLC. It shows various counters relating to network activity and call failure reasons.

```
>netsta
0000 Total Link outages
0000 Number busy
0000 Out of order
0000 Remote procedure error
0000 Reverse charging acceptance not subscribed
0000 Incompatible destination
0000 Fast select acceptance not subscribed
0000 Ship absent
0000 Invalid facility request
0000 Access barred
0000 Local procedure error
0000 Network congestion
0000 Not obtainable
0000 RPOA Out of order
0000 Unable to place IP call
0000 PORT # BAD
0000 INVALID CLASS
0000 RESTRICTED
0000 DISABLED
0000 WAS SSLC
0000 NO PORTS
0000 BUSY
0000 ALIAS ERR
0000 COLLISION
0000 REMOTE LOCKED
0000 NO ROUTING INFORMATION
0000 *UNKNOWN TYPE*
NODE-XXX AISwitch craft port
```

password

This command modifies the user account password for any user account.

Table 8-10 describes the number and type of characters allowed for passwords.

Table 8-10 Password Requirements

Number and Type of Characters	Characters
Maximum number of characters for passwords	120
Minimum number of characters for passwords	1
Accepted characters for passwords	Any printable character
Case sensitivity	Not case-sensitive

password oldpswd newpswd

This command changes a password.

Format

password *oldpswd newpswd*

Parameters

oldpswd Indicates the password for the user currently logged-in.

newpswd Indicates the new password.

password oldpswd newpswd username

This command is used by a supervisor to change any user password.

Format

password *oldpswd newpswd username*

Parameters

oldpswd Indicates the password for the currently logged-in user.

newpswd Indicates the new password.

username Indicates the name of user whose password is to be changed.

pick

This command picks up a call on hold.

You can pick up any call on hold even if the port does not own the call. With this command, you can terminate holding calls that were abandoned. (Use the dhold command to display a list of calls on hold.)

A user login is not required to execute this command. It may also be performed at the destinations menu by prefacing the command with a period (.):

.pick *port*

Format

pick *port*

Parameter

port	Specifies which holding port you wish to pick up.

plist

This command displays a list of all terminal port numbers that the system recognizes as active.

When the system is reset or turned on, the system tests all of the terminal smart line cards that are plugged in. If a port on a smart line card passes these diagnostic tests, then the port number appears in the list of online ports. If a port fails this test, or if the port fails testing requested by an operator subsequent to turning on the power, it is removed from this list.

If a port is not in this list, no operations can be performed on it, including making connections.

To place a port back in the online list after a board swap with the power on, enter the enabl command. To remove a terminal from the online list due to failures, use the disabl command.

prtdsc

This command views and records port descriptions for the AI194 ports.

Format

prtdsc *baseport*

Parameter

baseport	Indicates the baseport of the AI193/194 Ethernet card.

pstat

This command provides a quick way to retrieve the status of a specific port installed in the system. This command produces one of two reports, depending on whether the target port belongs to a smart line card or to a card without an onboard CPU.

For smart line cards, a report similar to the following appears.

```
Port state =NOT BEING SCANNED
Expires
 (secs)
Usage
588.14
Port #2 State=15  (Keyboard input timer)
Rx Quota = 000
PORT ONLINE

DSR HAS BEEN ON

DEV IS X.25

JetCLC AISwitch craft port
>@JetCLC 17:16:26 120195 Sev=F Base=000 Offset=001 Msg:

This TDS not associated with a VC

JetCLC AISwitch craft port
```

Format

pstat *port*

Parameter

port	Indicates the port number of interest.

The first line identifies the current port state. Table 8-11 describes the possible port states and their descriptions:

Table 8-11 Possible Port States and Descriptions

Port States	Description
CONNECT PENDING	Port is in process of being connected.
CONNECTED	Port is connected.
DISCONNECT PENDING	Port is in process of being disconnected.
ENTERING DNA	Port is entering a DNA for an X.25 call.
ENTERING PASSWORD	Port is entering a password.
ENTERING TCP ADDR	Port is entering an IP address for a TCP/IP call.
LOGGED INTO AI	Port is logged into AI.
NETWORK CONN PEND	Network connection is pending for the port.
NOT BEING SCANNED	The identified port is not being scanned for keyboard commands. (With the exception of the ASLC, no smart line cards can talk directly to the keyboard command/destination processor, therefore, they are not scanned.)
PORT IS ON HOLD	Port is on hold.
PVC CONNECT PEND	A PVC connection is pending.
RESPOND HOLD Y/N	Port is answering the "Wish to Hold?" question.
RESPONDING TO QUE	Port is answering the "Wish to Queue?" question.
SELECTING DEST	Port is KSR and is selecting a class of service.
WAITING IN QUEUE	Port is in queue; "C" character will cancel.

If no timeout features are set for the examined port, none will appear. Otherwise, timeout counts are in 1/64th second (15.625 milliseconds) ticks. A description of timers can be found in the tmract section.

RxQuota is used to identify chattering ports. When no valid destination is selected after receiving more than RxQuota characters, the port is disabled.

RxQuota is meaningful only for processorless smart line cards. For smart line cards, it will always be zero.

The next section in the report appears in a block and can vary in the number of lines printed. This block represents the port-side status. Table 8-12 describes the possible port-side statuses and their descriptions:

Table 8-12 Possible Port-Side State and Descriptions

Port-Side Status	Description
ACTIVITY SEEN/IGN	Activity has been seen or ignored on the port.
BAUD RATE IS SET	Baud rate for the port was properly set.
BREAK IS PENDING	A break is pending on the port.
BUFFER IS READY	Port buffer is ready.
LONG BREAK PENDIN	A long break is pending on the port.
PORT IS IN XOFF	Port is in XOFF state.
PORT IS ORIGINATR	Port is the connection originator.
PORT ONLINE	Port is online and ready for activity.

After a blank line, a second block of text describes the state of the external interface line to this port. Table 8-13 describes the possible external interface states.

Table 8-13 Possible External Interface State and Descriptions

Line-Side Information	Description
BASE OF SMART CARD	The smart line card baseport.
DSR HAS BEEN ON	The DSR modem signal has been active.
EXIT PROMPTER MUM	Non-verbose exit from the input prompter.
INACTIVE TASK	Port is executing a command (such as **dmpcfg**).
NETWORK ONLINE	The network link is marked online.
PORT IS REPEATING	Port is in command repeat mode.
PROTOCOL TRANSFER	Port is performing an asynchronous file transfer.
SAW RING AT DIAL	A ring was detected by the SAM card.
SOFTWARE DOWNLOAD	Port is downloading a software image from the CLC to a smart line card.
TANDEM CALL IPROG	A tandem call is in progress.

Table 8-13 Possible External Interface State and Descriptions (Continued)

Line-Side Information	Description
WINDOW HAS COUNT	Window transaction messages from the AI180 to the smart line card are queued.

After another blank line, the third block of text describes the type of smart line card the port is on. Table 8-14 describes the smart line card types.

Table 8-14 Smart Line Card Types and Descriptions

Smart Line Card Types	Descriptions
DEV IS SMART ASLC	Device is a four-port ASLC.
DEV IS SNMP SLC	Device is a smart line card which is directly configurable using SNMP.
DEV IS TCPIP PORT	Device is a TCP/IP network smart line card.
DEV IS X.25	Device is an X.25 network smart line card.

In addition to the report given by the CLC, a message from the smart line card appears on the log port. Information identical to that of the smart line card diagnostic screen appears but for only the single port being scanned. Refer to your individual smart line card manual for information on the diagnostic port display.

For cards without onboard CPUs, the report displays the current state of the port as recorded in the CLC state table:

Example Report

```
Port state =NOT BEING SCANNED
Rx Quota = 000
PORT ONLINE
BAUD RATE IS SET

DSR HAS BEEN ON

DEV IS DUMB 4PRT

TRANSMIT-ENABLE
DATA TERM RDY ON
RECEIVER-ENABLE
REQ TO SEND ON

TRANSMITTER EMPTY
CARRIER DETECT ON

Mode Reg 1- Mode Reg 2= 4D-BE
The baud rate is set to 9600
JetCLC AISwitch craft port
```

The information in the first and second blocks depicts the same information as that available for the smart line cards. This includes the current port state, the timeout features, the RxQuota, and then both the port-side and external interface statuses.

The third block of text describes the type of smart line card used. This information can be returned for dumb cards.

DEV IS DUMB This device is a processorless card.

Since the CLC holds more information about processorless smart line cards than smart line cards, the **`pstat`** command provides three additional blocks of information for dumb cards.

The fourth block describes the 2661 UART device control register. (See Philips 2661 data sheet for additional information.) Table 8-15 describes the control registers that might appear in this block.

Table 8-15 Possible Control Registers and Descriptions

Control Register	Description
DATA TERM RDY ON	DTR modem signal is on (output).
FORCE BREAK ON	A break is being forced by the UART.
MODE BIT 6 IS ON	UART mode control bit 6 is on.
MODE BIT 7 IS ON	UART mode control bit 7 is on.
RECEIVER-ENABLE	UART receiver is enabled.

Table 8-15 Possible Control Registers and Descriptions (Continued)

Control Register	Description
REQ TO SEND ON	RTS modem signal is on (output).
TRANSMIT-ENABLE	UART transmitter is enabled.
UART IN RESET	UART is being reset.

The fifth block describes the 2661 UART status control register. (See Philips 2661 data sheet for additional information.) Table 8-16 describes the status registers that might appear in this block.

Table 8-16 Possible Status Registers and Descriptions

Status Register	Status Register Description
CARRIER DETECT ON	CD modem control signal is on (input).
CHANGE IN DATASET	A modem control signal has changed states.
DATA SET READY ON	DSR modem control signal is on (input).
FRAMING ERROR ON	UART detected a framing error.
OVERRUN ERROR ON	UART detected an overrun error.
PARITY ERROR SEEN	UART detected a parity error.
RECEIVER HAD DATA	UART receiver buffer has data available.
TRANSMITTER EMPTY	UART transmitter data buffer is empty.

The sixth block of text consists of two lines. The first line provides the hexadecimal value of the two UART mode registers. The second line shows the baud rate setting of the UART line interface.

repeat

This command repeats a specified command. This command can only be issued from a dumb port. The **repeat** command allows you to specify the execution of a command as many times and as often as desired.

To terminate the command during repetition, press CTRL+c.

Format

repeat *n delay command parameters*

Parameters

n	Indicates the number of times the command is to be repeated.
delay	Indicates the time in seconds between the execution of each command.
command parameters	Indicates the command to be executed, including required parameters. The command should appear exactly as if it were being entered normally.

reset

This commands reboots the AI180. This forces a restart of the CLC and all the cards in the AI180. This is the same as pressing the **BOOT** button.

CAUTION: All call processing will stop and all connections will be lost during the reboot process.

Format

`reset`

This command restarts the CLC and all cards in the AI180. This is the same as pressing the **BOOT** button. The following message appears to verify that a reset is requested:

```
Are you sure you want to proceed? (Y/N) >
```

Enter **`y`** to continue, or **`n`** to abort the command.

This command differs slightly from other commands which reset the AI180. In a system with redundant CLCs, each of the methods selects a CLC for booting based on different rules. These are the commands and their effect on CLC selection:

`selcnf/b`	Resets the system and resumes using the same CLC.
`swcpu`	Resets the system and switches to the other CLC.
`reset`	Resets the system and uses the first CLC (slot A).

Notes: Use the **`enabl *`** command to restart all SLCs. See enabl for more information.

When you use the **`enable`** command to reset an AI2524, the fault light on the AI2524 appears for at least 60 seconds before the card reboots.

restee

This command writes to configuration memory.

Note: The **restee** commands are issued automatically by the AI180 when restoring a configuration made by **dmpee**. The **restee** command should not be issued directly by the user.

This command is used in the **dmpee** command. The **restee** commands and the data being stored are displayed on the your terminal.

restee address data [data...]

Format

restee *address data* **[***data***...]**

Parameters

data	Indicates the content written in EEPROM.
address	Indicates the starting location where that data is written.

restee/r address count data

Format

restee/r *address count data*

Parameters

address	Specifies the starting location where the data is written.
count	Specifies the number of times *data* is replicated into EEPROM starting at *address*.
data	Indicates the content written in EEPROM.

selcnf

This command reboots the CLC. Optionally, resets configuration to defaults.

selcnf/b

This command forces the system to reboot. After you enter this command, the following message appears on your screen:

```
Are you sure you want to proceed? (y/n)
```

Enter **y** to continue with the reboot, or **n** to abort the command.

CAUTION: All call processing will stop, and all connections will be lost during the reboot process.

This command differs slightly from other commands that reset the AI180. See the reset and swcpu commands.

Format

selcnf/b

Parameter

/b	Forces a total system restart.

selcnf/c

This command clears the system configuration. After you enter this command, the following message appears on your screen:

```
Are you sure you want to proceed? (y/n)
```

Type **y** to clear the system configuration, or **n** to abort the command.

CAUTION: This reinitializes the system configuration. Any previous configuration will be lost. The AI180 configuration will have to be reentered from scratch or from backup.

The system configuration can also be cleared by pressing CTRL+r on the craft port during the central AI180 initialization sequence. This must be completed before phase 1 is complete. (See CLC Initialization on page 2-4 for more information.)

Any commands you entered in Menu 1.9.2 will be executed after this reinitialization. If you wish to prevent the execution of these commands, press ESC at the craft port during the central AI180 initialization sequence. This must also be completed before phase 1 is complete.

It is highly recommended that the user first obtain copies of the system configuration in electronic and hardcopy form. See Chapter 6: Downloading Software and Configurations.

Format

```
selcnf/c
```

Parameter

/c	Resets the AI180, clears the existing configuration, and returns the configuration database to the factory defaults.

send

This command sends data to an asynchronous port. You cannot send a message to a terminal that is connected.

A user login is not required to execute this command. Enter it at the destination menu by prefacing the command with a period (.).

.send *port, message*

Format

.send *port,message*

Parameters

port	Indicates the destination port.
message	Indicates a one-line message to a terminal on the port.

shell

This command provides a list of the Telnet connections on the CLC. This example screen appears:

```
>shell
BOX1BAS4 AISwitch Shell Connection  0
     Shell                      Time (s) Disconn.
       Num State  Log User    Connected Time (s) IP Address
         0 conn   Off AI             48    14399 198.30.0.0
         1 conn   Off AI             47    14029 198.30.0.1
```

shobgc

This command provides a monitor display of the CLC background connections. This example screen appears:

```
>shobgc
BID     Base    Flags    TX pkts State

1       48      00       0       LOGGED INTO AI
2       48      00       0       LOGGED INTO AI
```

Table 8-17 describes the headings for the screen shown above.

Table 8-17 Heading Definitions for SHOBGC Command

Heading	Definition
BID	The background Connection ID number.
Base	The baseport of the smart line card.
Flags	Used by Technical Support.
TX pkts	The number of transmit packets queued to the connection.
State	The state of the connection.

shocls

This command lists aliases and all configured ports for the specified destination. If the *destination* argument is omitted, the data for all destinations on the system appears. Next to the port number, a symbol indicates the port status:

*	Port is busy.
H	Port is on hold.
D	Port is disabled.
N	Port does not exist.
X	Port is offline.

A report of all ports waiting to be connected to this destination appears in the order in which they will be connected.

Format

shocls[/l][*destination***]**

Parameters

/l	Sends the report to the log port.
destination	Specifies which destination to view.

Example Report

```
>shocls
Destination name AI
 Total ports assigned 000, ports inuse 000, ports free 000
  Queue high mark 000, Currently in queue 000
Destination name XDOT1
 Total ports assigned 016, ports inuse 002, ports free 014, port list follows:
  048  049  050  051  052  053  054  055
  056  057  058  059  060  061  062* 063*
  Queue high mark 000, Currently in queue 000
```

sholog

This command displays the last 1000 characters of log messages that were sent to the log port. It can be useful when there is no hardcopy record of the messages sent to the log. This command can help resolve faults which may have been pushed off of the log terminal display.

shoprt

This command shows the configuration of a port. There are two versions of this command.

shoprt[/l] port

This command specifies the port number to view. The fields in this report are described in Table 8-18.

Table 8-18 Field Descriptions for the shoprt Command

Field Label	Description
Pll-Phh Range	The port number you entered into the port argument. If you entered a range of ports, Pll = the low port number and Phh = the high port number.
Hardware	The hardware type keyword (see Table 8-19) indicating the type of card at the specified baseport.
Prt Typ	The port type setting (from menu 4.2.2.2), and displays one of these keywords: KCS, DST, DCS, or DED. See Table 8-19 for more information.
Destnam/Port	The destination name.
Abd	Indicates whether or not autobaud is enabled for this port.
Baud Rate	The port baud rate (menu 4.2.2.4).
WS	The number of bits per character (menu 4.2.2.5).
Stop	The number of stop bits (menu 4.2.2.6).
Parity	The port parity (menu 4.2.2.7).
Echo	Indicates whether automatic echoing of characters is enabled or not (menu 4.2.2, item 8).
Menu	Indicates whether the destination name for this port appears in the menu (menu 4.2.2, item 9).
Hold	Indicates whether or not the port is able to place a call on hold (menu 4.2.2, item 10).
Brk Disc	The "Disconnect via break" setting for this port (menu 4.2.2.11).
EIA Disc	The "EIA Disconnect" setting for this port (menu 4.2.2.12).

Table 8-18 Field Descriptions for the shoprt Command (Continued)

Field Label	Description
Discon RTS	The state of the RTS lead when disconnected (menu 4.2.2.13, item 1).
Discon DTR	The state of the DTR lead when disconnected (menu 4.2.2.13, item 2).
Connect RTS	The state of the RTS lead when connected (menu 4.2.2.13, item 3).
Connect DTR	The state of the DTR lead when connected (menu 4.2.2.13, item 4).
Toggle RTS	Indicates whether or not to toggle RTS when disconnecting (menu 4.2.2.13, item 5).
Toggle DTR	Indicates whether or not to toggle DTR when disconnecting (menu 4.2.2.13, item 6).
Protcl	Indicates the X.25 protocol version (if this is an X.25 card).
Description/Address	The port description and address (menu 4.2.2, item 14).

Format

shoprt[/l] *port*

Parameters

/l Indicates the report to your log port.

port Specifies which port to view.

Example Report

```
>shoprt 0
Pll-Phh Hard- Prt Destnam/ Ab- Baud  W St- Par- Ec- Me- Ho- Brk  EIA
Range   ware  Typ Port     d   Rate  S op  ity  ho  nu  ld  Disc Disc
          Discon  Connect Toggle  Pro Description/
          RTS DTR RTS DTR RTS DTR tcl Address
000 000 DUMB  KCS ******** OFF 9600  8 1   NONE ON  ON  OFF BRK  NONE ON  ON OFF
```

Table 8-19 describes the keywords the SHOPRT report uses.

Table 8-19 SHOPRT Report Keywords

Keyword	Description
ASLC	The Asynchronous Smart Port Card (AI176).
BRK	Indicates disconnect on break.
DCS	When keyboard activity is seen, the port is connected to a destination.
DED	The port is dedicated to another port.
DSR	Disconnect immediately when DSR goes off.
DST	The port(s) is a destination type terminal.
DUMB	The standard 4-port smart line card (AI183) or 16-port smart line card (AI185).
ETHER	The Ethernet TCP/IP card.
KCS	The port(s) is a user and can select a destination via the keyboard.
LBRK	Disconnect on long break.
LDSR	Disconnect only when DSR goes from on to off.
PASS	Pass DSR to RTS.
SSLC	The sync smart line card (AI187/AI188).
X.25	The X.25 smart line card.
XSSLC	The dual-slot sync smart line card (AI187/AI188).
AI070	The AI modem card.
AIFLX	The AI394 Fiber Concentrator card.
AI232	The AI232 asynchronous smart line card.

shoprt[/l]lport-hport

This command is identical to the **shoprt [/l]** *Port* command, except that you may specify a range of ports.

Format

shoprt [/l] *lport-hport*

Parameters

`/l`	Sends the report to your log port.
lport	Indicates the low port of the range of ports you wish to view.
hport	Indicates the high port of the range of ports you wish to view.

slist

This command lists the configured smart line card port ranges.

stacls

This command shows status information for a destination. See also shocls.

Format

stacls [/l] [*destination*]

Parameters

/l	Sends the report to your log port.
destination	Specifies the destination for which you want to see status information.

staeia

This command provides a brief status report of the EIA indicators for a specified port. The **staeia** command presents the incoming and outgoing EIA control signals for the port in question.

Format

staeia *port*

Parameter

port	Produces a status report showing the EIA indicators for the specified port.

staprt

This command shows the configuration of a port. See shoprt.

staslc

This command shows the status report for a smart line card. The status report includes information regarding the card configuration and status and will vary with each type of smart line card.

Messages from the CLC will be printed on the user's terminal, but the report from ASLC, X.25, TCP and other smart line cards will be printed on the log terminal only.

Format

staslc *baseport*

Parameter

baseport	Specifies the baseport number of the target smart line card.

stat

This command shows the status of the AI180 (login unnecessary). A message similar to the following appears:

```
+node,p,a,f-f,eechecksum$xxxx
```

The characters for the above message are described below:

Parameters

`+`	Indicates that a checksum value appears at the end of the line as `$xxxx`.
`node`	Indicates the node name.
`p`	Indicates the active CLC: either A or B.
`a`	Indicates the current alarm level: a value from 0 to 9.
`f-f`	64 characters in length where each character represents a group of four ports. Values are: 0 to 9 — Indicates the current alarm level for each group of four ports. X — Indicates a smart line card is configured but offline. Dash (-) — Indicates a four-port dumb card is installed or no card has been installed.
`eechecksum`	Indicates the checksum value for the configuration memory.

states

This command displays the status of configured ports, including port number, port ranges, and port status.

Example Response

```
states
0-6     SELECTING DEST          7-95    NOT BEING SCANNED
96-97   mCONNECTED              98-157  NOT BEING SCANNED
158-159 mCONNECTED              160-255 NOT BEING SCANNED
```

status

This command displays the CLC status report similar to this:

Example Report

```
>status
AISwitch status
 Welcome to AISwitch08:19:47 082801 Last restart 13:00 08/27
0 Connects active, 0 Connects on Hold
48 Ports present
0 Ports in wait queue
0 EEProm faults
73089 Bytes EEProm free
13414 Bytes EEProm reusable
3431 Buffers created
3421 Buffers free
0 Inter-CPU xactions
192 SLC window xactions
0 Scan max, Scan min 2147483647
0 Connections placed
0 Buffer alloc failures, 0 Buffer realignments, 0 TXTAIL misses
F2BDA776 Boot EEPROM checksum
F2BDA776 Current EEPROM checksum
Software version 98CLC200.000625 (08/17/01 15:43:49) /DEB/180/DUAL/WIP/WTX
Spurious Interrupt occured 0 times.  Most recent address was 0x00000000.
Executing from FLASH EEPROM
Backup CLC absent.
The current alarm level is 5
```

These are some of the important features this sample report identifies:

- Identifies the software currently installed, along with the creation date and time.
- Indicates the source of the current code being used by the system. It is executed from the BootLoader or FLASH.
- Indicates the presence or absence of a backup CLC.
- Indicates the current setting of the slot density value configured for the controlling AI180 chassis.
- Indicates the calculated total of reusable configuration memory. Displays the amount of free and reusable EEPROM space remaining as configuration data is added or deleted.

stpslc

This command requires confirmation before you can proceed. The card to be stopped will be shown, and you must type **Y** to confirm that you want to stop it. Typing **N** will abort the **stpslc** command and leave the card as it was.

Format

stpslc{*|*port***|** *lport-hport***}**

Parameters

*****	Allows you to stop only certain cards. The command will stop the card only if menu item 4.5 is enabled.
port	Indicates the number of the port to be stopped. If the baseport is selected, then the entire card stops and subsequent connections to the smart line card will be rejected.
lport	Sets the low port range that you wish to stop.
hport	Sets the high port range that you wish to stop.

swcpu

This command tests the system ability to switch to the backup CLC.

CAUTION: All call processing will stop and all connections will be lost during the reboot process.

Use this procedure for the test:

1. Be sure that you have a controlling chassis with an optional redundant CLC installed.
2. Set menu item 1.8 to ON to allow automatic switchover.
3. Copy your active CLC configuration to the backup CLC with the **`cpycnf`** command.
4. Verify that the CLC selector switch on the noncabled side of the controlling chassis is set to **AUTO**.
5. Issue the **`swcpu`** command. The system will ask you to verify the command. Type **`Y`** to continue with the command, or **`N`** to abort the command.

System control switches to the backup CLC.

This command differs slightly from other commands that reset the AI180. See the selcnf/b and reset commands.

telnet

This command initiates a Telnet session from the AI198 to an IP port.

Telnet sessions can be initiated from a craft or asynchronous port or from an incoming Telnet session.

System responses and available commands are the same for either form of the **telnet** command.

If the Telnet client connects successfully, you can perform any action allowed by the specified host. You may also invoke a limited number of functions in a local command mode. Table 8-20 describes the available local commands and their functions.

Table 8-20 Local Commands and Functions

Command	Function
CTRL	Enters the local command mode. A TELNET prompt appears.
?	Displays limited help information.
help	Displays limited help information.
SPACE BAR	Leaves the local mode and reconnects you to the Telnet session.
quit	Disconnects the Telnet session and shuts down the Telnet client in an orderly manner.

You may abort the **telnet** command by entering CTRL+c.

telnet xxx.xxx.xxx.xxx

This command initiates a Telnet session from the AI198 to any IP destination. When you enter the command without parameters, the names and destination IP addresses of all configured smart line card routing translation aliases appear.

Format

telnet *xxx.xxx.xxx.xxx*

Parameters

xxx.xxx.xxx.xxx	Indicates the IP address.

telnet xxx.xxx.xxx.xxx [Port#]

This command initiates a Telnet session by referencing a port IP address directly.

Format

telnet *xxx.xxx.xxx.xxx* [*port#*]

Parameters

xxx.xxx.xxx.xxx	Indicates the IP address.
port#	Indicates the optional destination server port number. (The default is port 23, the customary Telnet server port.)

test

This command tests a specified asynchronous port on a card.

A local loopback test will occur on the specified port number at the rate set on the smart line card. The **`test`** command verifies the integrity of the port hardware by running all possible binary combinations through the port in this loopback configuration.

If the test is successful, the port is placed back online, and the command prompt is printed. If the port fails any of these tests, a report is generated indicating what binary data caused the fault, and the port is placed on the disabled port list (see loop, lstdsb, enabl, disabl).

If any tested port is failing, you must swap the entire card and all its ports. (Remember that other ports will be affected during the swap.) Follow the procedure for hot-swapping smart line cards.

This test does not check the level converters on this module. To test the level converters, use the **`loop`** command.

tftpstat

This command determines how many configuration transfers have occurred between the AI198 and AI2524. The **`tftpstat`** command allows you to print a statistics report containing this information. The statistics report displays the baseport for an AI2524 and the number of uploads and downloads that have occurred. Uploads are configuration transfers from the AI2524 to the AI198. Downloads are configuration transfers from the AI198 to the AI2524.

Table 8-21 is an example of the statistics report.

Table 8-21 Example Statistics Report

Port	Uploads	Downloads
032	001	002

time

This command displays or changes the date and/or time. When used with no arguments, the **time** command displays the current time and date as kept by the CLC.

Setting the date is optional when setting the time. For example:

Enter this command to set the time to 2:20 p.m:

```
time 14:20
```

Enter this command to set both the time and date at once:

```
time 14:20 5/9/1996
```

Format

time *hh*:*mm*[:*ss*] [*mo*/*dd*/*ccyy*]

Parameters

hh	Specifies the hour (for a 24-hour clock).
mm	Specifies minutes.
ss	Specifies seconds.
mo	Specifies the month number.
dd	Specifies the day of the month.
ccyy	Specifies the year including century.

tmract

This command shows CLC software timer status.

The **tmract** command displays all the ports with countdown timers activated. This command is used to aid in field system debugging. This is an example screen:

```
>tmract
Expires
(secs)  Usage
0.01    Craft port command scanner
0.00    Test connected ports
0.00    Performance display
0.00    Interprocessor communications
0.03    Alarm output validation
0.57    Automatic port connect
0.57    Stack monitor
14.35   Power supply test
14.39   EEPROM change monitor
```

This timer list is also used in the PSTAT display. The first column indicates the number of seconds until the timer expires. The second column indicates the item being timed.

System timers include:

- CAAML retry timer
- CAAML idle timer
- Density switch consistency test
- Power supply test
- Performance display
- On-board low voltage test
- Protocol transfer
- Interprocessor communications
- Alarm output validation
- SDI idle timer
- SDI State Machine custodian
- Craft port command scanner
- Stack monitor
- Automatic port connect
- Test connected ports
- EEPROM change monitor

Port timers list the port number affected by the timer. The state value indicates the condition being timed.

Table 8-22 Port Timers

Port Number	Port Timer Condition
0	Indicates bad timeout access.
1	Indicates autobaud timer for port line input.
2	Indicates autobaud no input character timer for port.
3	Indicates break attention timer.
4	Indicates connect timeout.
5	Indicates max session timeout.
6	Indicates post-disconnect timeout.
7	Indicates force connect timeout.
8	Indicates toggle dataset bit timeout.
9	Indicates SAM touch-tone digit timeout.
10	Indicates SAM CO line timeout (off/on hook delay).
11	Indicates ring simulation timeout.
12	Indicates dial digit timeout.
13	Indicates send touch-tone digits remote user pickup wait.
14	Indicates SAM KCS connect timer.
15	Indicates keyboard input timer.
16	Indicates a **`repeat`** command timer.
	Indicates an input **`break`** timeout.
	Indicates a **`break`** generation.
	Indicates an inactive task.
	Indicates SDI shutdown port after printing.
	Indicates wait for autobaud character.

tstini

This command checks the reinitialization strings and assures that they are uncorrupted. It will display a message indicating a status of GOOD or BAD.

unlock

This command changes a locked system back to normal operating mode. When you log out, the AI180 will be unlocked automatically.

update

This command shows the current software versions, copies or clears internal program banks, initiates system-wide smart line card updates, or forces ailing smart line cards to accept software updates.

When used without arguments, the **update** command provides information about the current versions of software in all the FLASH and BootROM EPROM banks on the active and backup CLCs:

```
>UPDATE

Listing of code stored in the CLCs.
===================================

Active CLC's primary bank: 98CLC100.002589
Name: 98clc100.img
Comments:
This is 98clc100 firmware.

Active CLC's secondary bank: 95MPR100.000000
Name: mpr.aii_parent
Comments:
Tue Dec 19 10:14:56 EST 1995

Active CLC's BootROM: 98BLD100.000038
Name: 198boot.all
Comments:
This is the standard AI198 boot loader.

Backup CLC not Present.
```

In this example, the current CLC software version is shown as 98CLC100.002589. The BootROM version is 98BLD100.000038. The example also shows a smart line card software image stored in the secondary bank: 95MPR100.000000. There is no backup CLC installed in this example.

update [sbank dbank]

This command copies software from one FLASH EPROM bank on a CLC to any other FLASH EPROM bank on a CLC.

Format

update [*sbank dbank***]**

Parameters

sbank	Specifies the source FLASH bank.
dbank	Specifies the destination FLASH bank.

Table 8-23 describes the FLASH EPROM banks.

Table 8-23 FLASH EPROM Bank Arguments

Bank	Description
ap	The active CLC primary bank. Software in this bank is run by the active CLC when booted.
as	The active CLC secondary bank. Software for CLCs or smart line cards may be downloaded into this bank. This bank is for storage only.
bp	The backup CLC primary bank. Software in this bank is run by the CLC when a CPU switchover occurs.
bs	The backup CLC secondary bank. Secondary storage bank.

For example, enter this command.

```
update as ap
```

This will copy software code from the active CLC secondary bank to the active primary bank. This command is a step in activating a newly downloaded CLC software image.

Certain combinations are not valid and will cause an error to be logged. Banks cannot be copied onto themselves. Primary banks on one CLC cannot be overwritten by banks from a different CLC. Table 8-24 describes the combinations that are illegal.

Table 8-24 Illegal FLASH EPROM Bank Arguments

Illegal Combination	Reason
ap ap	Indicates that it cannot copy the bank onto itself.
as as	Indicates that it cannot copy the bank onto itself.
bp bp	Indicates that it cannot copy the bank onto itself.
bs bs	Indicates that it cannot copy the bank onto itself.
ap bp	Indicates that it cannot copy into the primary bank across CLCs.
as bp	Indicates that it cannot copy into the primary bank across CLCs.
bp ap	Indicates that it cannot copy into the primary bank across CLCs.
bs ap	Indicates that it cannot copy into the primary bank across CLCs.

update/c secondary

This command clears the active or backup CLC secondary FLASH EPROM bank.

Format

update/c *secondary*

Parameter

secondary	Can be either **as** (active secondary) or **bs** (backup secondary).

update/f baseport

This command forces a software download to a smart line card at the specified baseport number. A valid software image for the target smart line card should exist in the CLC active secondary FLASH bank prior to the execution of this command.

CAUTION: This command is used in response to a serious smart line card software failure and should be used only by Technical Support.

This command provides protection if faulty software is loaded into a smart line card, as could occur during the software development process. In such a case, the smart line card could stop responding and may not accept replacement software downloaded by means other than this command.

Format

update/f *baseport*

Parameter

baseport	Allows you to force a software download to a smart line card at this specified baseport.

update/s

This command causes each download-capable smart line card in the entire AI180 to request a software image update from the CLC. If a compatible image is found in the active secondary bank, the update will proceed. Cards which are not download-capable or do not find a compatible software image are not affected.

This command reports progress or errors only for those smart line cards which are compatible with the software image being uploaded.

CAUTION: This command is a powerful variant of the **`winslc update`** command and should be used with caution. When successful, this command causes the responding smart line cards to clear their calls and go offline while their software is updated.

CAUTION: The AI196-I hardware can run both AI196 X.25 and AI196 XIRB software. If an AI180 chassis contains AI196-I hardware running both types of software, do not use this command to update the smart line card software. Instead, use the winslc update command to update individual smart line cards.

watcpu

This command shows which CPU is active.

In a system with redundant CLCs, this command shows which CLC is currently operating. For the AI180, the state of the CLC selector switch on the noncabled side of the chassis is also displayed.

After a reset, if the system has redundant logic (two CLCs) and the CLC selector switch is set to AUTO, the A CLC will be used. If that CLC fails for software or hardware reasons, the B CLC will be selected. You can use the **`watcpu`** command to verify when the system has switched to the backup CLC.

who

This command displays what users are logged into the AI180, when they logged in, the port they logged into, and the IP address of the shell connection.

To access the **who** command, enter **who** at the command prompt. A screen similar to this appears:

```
>who
Time of Login          UserName     Port/BID/SID     IP address
-------------------------------------------------------------------------------
09:34 11/29/2000   USR1             017
09:36 11/29/2000   USR2             S-001            172.016.051.144
09:37 11/29/2000   USR1             S-002            172.016.003.033
```

Note: FTP logins are not displayed.

who/a

This command prints a list of the 50 most recent successful logins of the AIswitch. Enter **who/a** at the command prompt to display a screen similar to the one below.

```
Time of Login      UserName     Port/BID/SID     IP address
-------------------------------------------------------------
15:20 02/13/2001   PUBS             craft
```

Note: Only successful logins will be displayed.

winslc

This command sends window transaction commands to a smart line card. You must be logged in and have the alarm/activity log enabled. (See menu item 1.1.1.)

The **winslc** commands are specific to each smart line card. Not all smart line cards support all **winslc** commands. For information on the specific window transactions available, see the user's manual for the specific smart line card.

Format

winslc *baseport command parameters*

Parameters

baseport	Specifies the baseport of the target smart line card.
command	Represents window transaction commands (not commands from the command prompt).
parameters	Represents window transaction command parameters.

wndrct

This command synthesizes CLC-to-smart line card and smart line card-to-CLC messages. The **wndrct** command sends a window transaction to a smart line card.

This is an example of the **wndrct** command:

```
wndrct 64 6 E 0
```

This sends a MST_CLEAR_X25 message on TDS 78 to the smart line card at baseport 64.

The transaction length (the third byte) must agree with the amount of data entered. Otherwise, an error message will be printed, and no transaction will be sent. The maximum number of characters which may be entered on the command line is 250.

The **/s** option simulates a window transaction received by the CLC from a smart line card.

Note: This command is used to isolate system faults and should be used only by Technical Support.

Format

wndrct *baseport n n ...*

Parameters

baseport	Specifies the baseport of the target smart line card (a decimal value).
n	Specifies a hexadecimal transaction code to be sent.

Messages

This chapter discusses various message types and user responses.

Guide to this Chapter

Contacting Technical Support

Contact AI Technical Support for error messages relating to the MK198CFG conversion utility.

Crash codes and some alarm conditions present serious problems that should be reported to AI Technical Support. Carefully record any information associated with the crash dump or alarm message and contact Technical Support by phone.

User Input Errors

User input errors occur as a result of direct user interaction at a menu, command, or selection prompt. These errors can be corrected by the user and do not affect AI180 performance. The CLC provides a variety of error messages to assist you in proper AI180 configuration and use.

When you type a command or a response to a system prompt, an error can occur if the proper syntax is not used, or if the system is configured in a way to make an otherwise valid command inappropriate.

When this type of error occurs, the CLC responds immediately with an error message on the port where the input occurred. User input errors are not duplicated on the log port.

User input errors occur in these modes:

User Mode	When selecting a destination, an error can occur if the destination is invalid or is restricted from the initiating site.
Command Mode	After logging into a destination, errors can occur when typing commands at the command prompt. See Chapter 8: Commands from the AI Prompt for proper syntax and rules of use for each command.
Menu Mode	When using the configuration menu system, improper selections can cause errors. See Chapter 4: System Configuration by Menu for details.

User input errors do not affect AI180 performance. The error messages which appear in these modes will guide you to make any necessary corrections.

Log Messages

Log messages are sent to the log or craft port and are displayed by severity level. They are generated by the AI198 as a result of alarm conditions and AI180 activity.

Where noted in the messages listed below, some of these conditions warrant contacting Technical Support.

Severity Levels

All activity and error messages have an associated severity level (expressed as a hexadecimal value). The values and their meanings are:

Table 9-1 Severity Levels Values and Meanings

Value	Meaning
0	Indicates normal activity.
1	Indicates a transient call error or error event (buffer quota, busy, and so on).
2	Indicates a transient link error (DCD on/off, loss of sync, and so on).
3	Indicates a severe call processing error.
4	Indicates a link is down (frame, packet).
5	Indicates a severe software error (memory corruption, window transaction, loss of data, and so on).
6	Indicates a partial hardware fault on a card (CLC/Smart Line Card).
7	Indicates a total hardware/software failure on a smart line card (crash dump).
F	Indicates user requested info (**`staslc`** output, **`dmpslc`** output).

These levels cannot be changed, but the AI180 can be configured to restrict which levels are displayed by adjusting the severity level thresholds on Menu 1.1. By setting the threshold values for the activity log, you control which message levels are logged and which are ignored.

In a similar fashion, you can set the minimum and maximum severity levels for minor and major alarms. This allows you to limit or expand the messages which are associated with these alarm conditions.

User-requested output and logs do not affect the treatment of minor and major alarms.

The display of user-requested information on the activity log cannot be disabled since it has a severity level of 15 (hexadecimal F), six points higher than the maximum valid threshold value that can be set in Menu 1.1.

Message Text

When a log message is generated by the backup CLC in a redundant system, the message is preceded by this text:

```
From BACKUP CLC:
```

If this message is not present, the message is from the active processor.

Messages from the smart line cards also appear on the log port. In such a case, additional information precedes the message, describing the severity level, baseport and offset of the card:

```
Sev= ...  baseport = ...  Offset = ...  Msg:
```

See the user's manual for your specific smart line card for explanations of smart line card messages.

Note: Where noted, some of these conditions warrant contacting AI Technical Support.

The messages are grouped by severity level and listed in alphabetic order.

Normal Activity (Level 0) Messages

0 `Connecting port n`

A normal connect occurred on the CLC.

0 `Disconnected port n from port m`

A normal disconnect occurred on the CLC.

0 `Disconnected port n from port m, SLC Confirmation`

A normal disconnect occurred on the CLC with confirmation from the smart line card.

0 `Fast select done reason=r, diagnostic=d`

A fast select packet was sent by a smart line card.

0 `Port n Calling DNA=a on SSLC port m`

A normal X.25 call occurred on the CLC with *a* as the DNA.

0 `Port n Calling IPA= a on SSLC port m`

A normal TCP/IP call occurred on the CLC with *a* as the IP address.

0 `Received SLC call on TDS n`

A smart line card is notifying the CLC of a network call request.

0 `Req NET disconnect port n from port m`

A network disconnect occurred on the CLC.

0 `RX Fastsel from DNA a, on port n Msg follows:`

A fast select packet was received by a smart line card on port *n*.

Transient Call (Level 1) Messages

1 `Call collision - port n already connected to port m`

An inbound and an outbound call were attempted at the same time with the same TDS assigned to a smart line card. This indicates that your smart line card is in need of upgrade. Contact Technical Support.

1 `Call failed reason=r, diagnostic=d from port n`

A smart line card call from port *p* failed. See the user's manual for the specific smart line card for call failure reason codes.

1 `**Destination xxx, Password error on port n`

A user has attempted to connect to a password-protected destination and has not entered the proper password. The port number mentioned is the user's location.

1 `**Destination xxx, Restriction error on port n`

A user on port *n* has attempted to connect to a restricted destination. The user is not allowed access from this port to this destination.

1 `Error: Initialization string too long, being discarded - xxx`

One of the initialization strings, as entered in Menu 1.9.1, Menu 1.9.2, Menu 4.3.5, or Menu 4.18, is too long. Try reducing the string sizes.

1 `**Host answer fault port number n`

A host computer (or some external system) connected to a destination name with the "ring simulate" menu item turned on did not signal properly with its EIA signal leads. Since the call could not be placed to port *n*, the port was removed from the list of online ports in order to keep the hunt group working. Try again later, and the system will use the next available port in the destination. Repair the problem on the host or with the cable and use the **`enabl`** command to bring the port back online.

1 `Macro translation error in alias: xxx`

An alias macro contains the wrong syntax. See Chapter 7: Call Routing for proper alias macro syntax.

1 `Network marked ON-line`

The smart line card is ready to process network calls.

1 `Queuing port n, For destination xxx`

A call was made to a destination that had no available ports, and the user placed the call in a queue until a port on that destination becomes available.

1 `Re-placing call. Alternate routing string:`*`xxx`*`,  Attempt #`*`n`*

A connection attempt of an alias failed, so an alternate routing string was used to establish an alternate connection.

1 `Rejecting SSLC Slave connect reason=`*`xxx`*` from port `*`n`*

A smart line card call from port *n* was rejected. See the user's manual of the specific smart line card for call failure reason codes.

1 `SLC booted on baseport `*`n`*

The smart line card booted successfully on port *n*.

1 `Sum of string lengths too long for unified transaction`

A window transaction could not be sent to the smart line card because the sum of the strings exceeded the maximum transaction size. Try using smaller strings in the calling aliases.

1 `Truncated long input string.`

A calling string has a length larger than 200 characters. Try using shorter strings.

1 `Unable to allocate port for unified SLV_CALL`

An attempt was made to make a multiplexed call with insufficient routing data. Make sure the routing alias has information in at least one of these fields: Call data, Called address, or Caller's address.

1 `Unable to resolve destination`

A call request was initiated to an unknown destination. Make sure the destination exists before the call is made.

1 `User call rejected. Reason: `*`xxx`*

A user call could not be completed for the stated reason.

Severe Call Processing (Level 3) Messages

3 `Missing or malformed ID field in unified transaction`

A corrupt unified window transaction was received by the CLC.

3 `No routing strings present in SLV_CALL unified transaction`

The CLC received a call request with no routing information.

3 `**Overrun failure on port` *n*

When a call is placed in the system, an overrun error causing the loss of data has been sensed. If this error happens at the beginning or at the end of a call, it is not serious. If this error occurs regularly during calls which have been in place, there is a system problem. Contact Technical Support.

3 `Received background transaction on unassociated BID #`*n*

A bad background window transaction was received from port *n*. Contact Technical Support.

3 `Unknown SYS_REQUEST type`

A SYS_REQUEST window transaction was received with an unrecognizable type. Contact Technical Support.

3 `Unknown unified window transaction type -` *xxx*

A corrupt unified window transaction was received by the CLC.

3 `user fails Security Agent login attempts on port` *n*

Too many unsuccessful logins were attempted on the security agent. Check password.

Link Down (Level 4) Messages

4 `Network marked OFF-line`

The network interface on a smart line card has been disabled.

4 `tncWrite(): call data client info not found`

The Telnet client has attempted to write to a Telnet server after the Telnet server has closed the connection. You must reconnect the Telnet client to the server.

Severe Software Error (Level 5) Messages

5 `Call accept when no call in progress`

5 `Call disconnect when no call in progress`

5 `Call fail when no call in progress`

An internal problem occurred in the call processing states of the CLC. Contact Technical Support.

5 `Clear confirm when no clear requested. State = xxx`

An internal problem occurred in the call processing states of the AI180. Contact Technical Support.

5 `Illegal Msg_ctrl field from port nnn. Discarding fragment.`

A window transaction with a corrupt field was received from port *nnn*. Contact Technical Support.

5 `Illegal port number in set_old_timer`

A software error occurred on the CLC. Contact Technical Support.

5 `Linked transactions of different types from SLC at n`

Two or more linked unified window transactions with different type fields were received from the smart line card. Contact Technical Support.

5 `**Timer fault PRTSTA=s PRTFLG=f PRTFL2=e PRTTMS=t PRTSLV=v on port n`

A software error has been detected. Record the information in the message and contact Technical Support.

5 `**WINDOW Fault, bad RX trancode=t, SubChnl=s from port n`

A unknown transaction code has been sent by the smart line card on the port mentioned in the error message. Make sure that the smart line card and the CLC have compatible software revisions installed. This message is also generated if the card is removed from the backplane without first using the **`disabl`** command.

Partial Hardware Fault (Level 6) Messages

6 `**?EEPROM Write ->fault<-, Call AII`

While entering data into the configuration memory, the system sensed a hardware problem with that memory. You have a serious problem and should contact Technical Support to get further assistance.

6 `Exit called with value` *`n`* `by` *`xxx`*

A serious software error occurred in the CLC operating system. Contact Technical Support.

Total Hardware (Level 7) Messages

7 `Power supply has one or more defective power rails`

The indicated power supply, either #1 or #2, has a problem. The power supply should be checked and either repaired or replaced.

7 `** SLC has crashed (Fault info follows)`

A smart line card has a serious hardware or software fault and has dropped out of service. Record the information in the fault trace which follows and contact Technical Support with this information.

7 `SLC failed to boot on baseport` *n*

Smart Line Card failed to boot on port *n*. Check the smart line card.

User Requested (Level F) Messages

F `*******AISwitch Restarted*******`

This message is displayed once the system has booted.

F `**Buffer quota exceeded on log port - log flushed`

The log port has been unable to empty the queue of alarm messages fast enough. It is either too slow for your use, or it has been paused too long by an XOFF (CTRL+s). The maximum number of messages the system can hold has been exceeded, so to protect the integrity of the system, all the backlogged messages have been discarded and the log has been restarted.

F `**Logging in to switch (AI) from port` *n*

Destination "AI" was selected on port *n*.

F `--> LOG STARTED on this port, was on port` *n*

The log port has changed from port *n* to the current port.

F `--> LOG STOPPED on this port, changed to port` *n*

The log port has changed from the current port to port *n*.

F `Clock reset`

The CLC time was changed to a different value.

F `Dump block follows from Smart Card`

This shows a portion of the memory dump from the smart line card.

F `EEPROM checksum=`*n*

This shows the current checksum of the EEPROM.

F `SLC Reports ready for transactions`

The smart line card has received its boot block and is ready to process window transactions.

F `This cpu is the [A/B] Processor, Switch is in [MANUAL/AUTOMATIC]`

Startup information about the boot status of the AI180.

F `Total number of online ports` *n*

This shows the total number of ports used by all cards in the system.

`Version n.n` *(mm/dd/yy hh:mm:ss) xxx*

Information about the software version, date, and assembly options.

Startup Messages

AI2524

Hardware supports identification of the AI2524 which allows the AI198 to physically identify the card upon startup. The AI198 reads the hardware on startup and notifies you when a misconfiguration has occurred. One of these messages appear:

`Card at baseport` *N* `is AI2524. Misconfigured card`

The system detects a misconfiguration when a slot is configured for some card other than the AI2524. The AI198 detects the misconfiguration and displays this message.

`Card at baseport` *XXX* `is not an AI2524. Misconfigured Card`

The AI198 displays this message when the AI2524 is configured but not installed.

`Card at baseport` *XXX* `is functional`

The AI198 displays this message when the AI2524 is configured and installed.

AI294

Hardware supports identification of the AI294 which allows the AI198 to physically identify the card upon startup. The AI198 reads the hardware on startup and notifies you when a misconfiguration has occurred. One of these messages appear:

`Card at baseport` *N* `is AI294. Misconfigured card`

The system detects a misconfiguration when a slot is configured for some card other than the AI294. The AI198 detects the misconfiguration and displays this message.

`Card at baseport` *XXX* `is not an AI294. Misconfigured Card`

The AI198 displays this message when the AI294 is configured but not installed.

`Card at baseport` *XXX* `is functional`

The AI198 displays this message when the AI294 is configured and installed.

SNMP Traps

Trap Messages

An SNMP trap is an asynchronous SNMP message usually sent from an SNMP agent to an SNMP manager, indicating that a specific event has occurred. The AI198 has the potential to send many types of trap messages to the SNMP manager whose IP address appears in the CLC trap table (aiCLCTrapTable).

Any task running on the AI198 can produce a trap. Each trap has a message number and message text describing the error or status change that occurred on the AI198. The severity of traps on the AI198 ranges from the marking of planned events to alerting the SNMP manager of serious system errors.

Where noted, some of these conditions warrant contacting Technical Support.

The SNMP trap messages generated by the AI198 are listed by message number.

27 `Received background transaction on unassociated BID #`*n*

A bad background window transaction was received from port *n*. Contact Technical Support.

28 `**WINDOW Fault, bad RX trancode=`*t*`, SubChnl=`*s*` from port `*n*

A unknown transaction code has been send by the smart line card on the port mentioned in the error message. Make sure that the smart line card and the CLC have compatible software revisions installed. This message is also generated if the card is removed from the backplane without first using the disabl command.

29 `Macro translation error in alias: `*xxx*

An alias macro contains the wrong syntax. See Chapter 7: Call Routing for proper alias macro syntax.

30 `Unknown SYS_REQUEST type`

A SYS_REQUEST window transaction was received with an unrecognizable type. Contact Technical Support.

31 `Call fail when no call in progress`

32 `Call disconnect when no call in progress`

33 `Call accept when no call in progress`

An internal problem occurred in the call processing states of the CLC. Contact Technical Support.

35 `The AISwitch has crashed.`

A serious problem occurred on the AI198 causing it to shut down. The execution of the **`dump`** command can also cause this problem. Save the dump information, and contact Technical Support.

37 `Error-cannot copy configuration to backup CLC.`

An error occurred while copying the EEPROM configuration to the backup CLC. Check and correct operation of the backup CLC.

38 `An error occurred while copying configuration.`

An error occurred while copying the EEPROM configuration to the backup CLC. Check and correct operation of the backup CLC.

39 `Warning: Detected configuration update interruption. Current configuration is now invalid.`

An interruption was detected during EEPROM configuration update. The configuration of the target CLC is now invalid. Retry the update procedure.

50 `**?EEPROM Write ->fault<-, Call AII`

While entering data into the configuration memory, the system sensed a hardware problem with that memory. You have a serious problem and should contact Technical Support for assistance.

51 `**?EEPROM Write->bad address<-, call AII.`

A serious problem occurred while writing to the EEPROM. Contact Technical Support.

52 `--EEPROM WRITE FAULT. DO NOT CONTINUE. CALL AII.`

A serious problem occurred while writing to the EEPROM. Contact Technical Support.

53 `**SETTING CONFIGURATION TO INITIAL FACTORY DEFAULTS.`

The EEPROM configuration is set to factory default. Either the operator executed **`selcnf/c`**, or the EEPROM configuration was invalid, causing a reset to factory default.

57 `Illegal Msg_ctrl field from port` *`nnn`*`. Discarding fragment.`

A window transaction was received from port *nnn* with a corrupt field. Contact Technical Support.

58 `Truncated long input string.`

A calling string has a length larger than 200 characters. Try using shorter strings.

59 `Sum of string lengths too long for unified transaction`

A window transaction could not be sent to the smart line card because the sum of the strings exceeded the maximum transaction size. Try using smaller strings in the calling aliases.

60 `Error: Initialization string too long, being discarded -` *`xxx`*

One of the initialization strings entered in Menu 1.9.1, Menu 1.9.2, Menu 4.3.5, or Menu 4.18 is too long. Try reducing the string sizes.

61 `Linked transactions of different types from SLC at n`

Two or more linked unified window transactions with different type fields were received from the smart line card. Contact Technical Support.

64 `Unable to resolve destination`

A call request was initiated to an unknown destination. Make sure the destination exists before the call is made.

65 `--NO MORE EEPROM SPACE. CANNOT CONTINUE.`

No more space is available on the EEPROM for saving the configuration. Contact Technical Support.

66 `--NO MORE EEPROM SPACE. DATA NOT SAVED.`

No more space is available on the EEPROM for saving the configuration. Contact Technical Support.

67 `Window sent to non-baseport`

The CLC attempted to send a window transaction to a non-baseport of a non-smart line card. Contact Technical Support.

69 `Power supply has one or more defective power rails`

The indicated power supply, either #1 or #2, has a problem. The power supply should be checked and either repaired or replaced.

70 `**Overrun failure on port n`

When a call is placed on the system, an overrun error causing the loss of data has been sensed. If this error happens at the beginning or at the end of a call, it is not serious. If this error occurs regularly during calls which have been in place, there is a system problem. Contact Technical Support.

74 `Thermal alarm is on or both power supplies have one or more defective rails.`

The CLC has detected a problem with the power supplies on the AI180. Make sure both power supplies are on. Contact Technical Support.

76 `SHUTDOWN-The security system is unavailable, please try again later.`

The security system is shutting down due to the previously logged error message.

77 `user fails Security Agent login attempts on port n`

Too many unsuccessful logins were attempted on the security agent. Check password.

78 `Failed to establish connection to Security Agent.`

The CLC was unable to establish connection with the security agent. Check for the presence and proper configuration of the security agent. Also, check for the proper alias configuration and connections to the security agent.

79 `SDI HPL port lost connection with Security Agent.`

The high secure loop port has lost connection with the security agent. Check for proper operation of the security agent.

80 `Invalid SECURE LOOP port number.`

The secure loop port number used in the configuration is invalid. Make sure this port number and this port number +1 can be associated with a valid dumb port.

81 `Security Agent message is inappropriate in context as follows: mmm.`

The security agent has sent an invalid message to the CLC.

83 `SDI security system shutting down via SECURE DISABLE.`

The **`secure disable`** command has been executed on the CLC, causing the SDI security system to shut down.

84 `SHUTDOWN-Session idle timer expired or session aborted by Security Agent.`

Either the security agent has aborted the session or the timer has expired on a **`secure idle`** command.

85 `Unable to allocate port for unified SLV_CALL`

An attempt was made to make a multiplexed call with insufficient routing data. Make sure the routing alias has information in at least one of these fields: Call data, Called address, or Caller's address.

86 `The EEPROM configuration has changed.`

The EEPROM configuration of the CLC has changed.

87 `SLC failed to boot on baseport n`

Smart Line Card failed to boot on port *n*. Check the smart line card.

89 `Calling card is not IRB type.`

An attempt was made to configure a non-IRB card. Check your configuration.

90 `Calling card is not TDS type.`

An attempt was made to configure a non-TDS card. Check your configuration.

93 `Clear confirm when no clear requested. State = xxx`

An internal problem occurred in the call processing states of the AI180. Contact Technical Support.

104 `WARNING: STACK ERROR IN PROGDWNDL MODULE.`

A serious software error occurred on the CLC. Contact Technical Support.

110 `**Timer fault PRTSTA=`*s* `PRTFLG=`*f* `PRTFL2=`*e* `PRTTMS=`*t* `PRTSLV=`*v* `on port` *n*

A software error has been detected. Record the information in the message, and contact the Technical Support.

111 `Illegal port number in set_old_timer`

A software error occurred on the CLC. Contact Technical Support.

112 `Active CLC timed out while waiting for backup to respond to request.`

An error occurred when the active CLC tried to establish communication with the backup CLC. Check for the presence and correct operation of the backup.

113 `Exit called with value` *n* `by` *xxx*

A serious software error occurred in the CLC operating system. Contact Technical Support.

114 `Missing or malformed ID field in unified transaction`

A corrupt unified window transaction was received by the CLC.

115 `No routing strings present in SLV_CALL unified transaction`

The CLC received a call request with no routing information.

116 `Unknown unified window transaction type - xxx`

A corrupt unified window transaction was received by the CLC.

118 `** SLC has crashed (Fault info follows)`

A smart line card has a serious hardware or software fault and has dropped out of service. Record the information in the fault trace which follows, and contact Technical Support with this information.

Proprietary MIB Objects Sent with AI198 SNMP Traps

The proprietary MIB objects and their corresponding values can be included in the AI198 proprietary traps.

aiCLCAsynchTrap

This object is used to enable and disable the sending of asynchronous trap events to configured SNMP managers. For compatibility with AppliedView, this object defaults to the disabled state.

aiCLCColdStartTrapDelay

This object specifies the time in seconds to delay the sending of the cold start trap upon system startup. A system may need to delay sending this trap if the IP connection to the AI198 depends upon a connection that takes a while to complete.

For example, when using IP over X.25, IP connectivity is not established until the X.25 connection is completed successfully. This may take many seconds or even minutes. The system would want to delay the cold start trap so that the IP connection could be established.

aiCLCCrashMsgText

This read-only object contains a crash dump of the process that caused the crash. This information should be sent to Technical Support.

aiCLCFtpCtrlPort

This object is used to configure the FTP server control port number. The data port number will automatically be configured to be one less than the control port number. The control port number may range from 1 to 65535 but defaults to port 23.

aiCLCLastTrapMsgNum

This read-only object contains the message number of the last log message generated. Log message numbers are shown in the section of this chapter Trap Messages on page 9-16.

aiCLCLastTrapMsgText

This read-only object contains the text message from the last generated trap.

aiCLCNumEventsSinceLastTrap

This read-only object contains the number of times an event-generating trap has occurred since the last time that trap was transmitted. Each message number has an associated aiCLCNumEventsSinceLastTrap object.

When a proprietary trap is generated, its transmission time is stored for each associated message number. If the same message is generated again while an interval equal to aiCLCTrapTimer has not yet passed, a counter is incremented, but an SNMP trap is not transmitted. When the trap is transmitted again, the counter value is sent with the trap. The counter then clears.

aiCLCTelnetServerPort

This object is used to configure the Telnet server port number. This port number may range from 1 to 65535 but defaults to port 21.

aiCLCTrapTimer

This read-write object is the interval (in seconds) during which a trap is not transmitted (see aiCLCNumEventsSinceLastTrap). The default value of this timer is 300 seconds. Only traps using the aiCLCNumEventsSinceLastTrap object use this timer.

Crash Codes

Crash codes indicate that the system has detected a serious hardware or software fault.

This section describes crash code reasons for the AI198. You will find similar listings for each smart line card in their respective user's manuals. The codes are reported to the log port when cards crash, and the **`AISWITCH FAULT DUMP`** message is received. This message indicates that the system has detected a serious hardware or software fault.

To identify the problem(s), carefully record the code information generated by the crash dump and contact AI Technical Support.

Common Crash Codes

These codes are common to the software on all AI products.

Table 9-2 Common Crash Codes

Crash Code	Description
0001	Indicates a bus error.
0002	Indicates an address error.
0003	Indicates an illegal instruction.
0004	Indicates a zero divide error.
0005	Indicates to check the instruction trap.
0006	Indicates a TRAPV error.
0007	Indicates a privilege error.
0008	Indicates a trace trap.
0009	Indicates an unused exception vector.
xx09	Indicates an illegal vector where xx (nonzero) is the vector number. This is used in place of the codes above in order to ensure that the exact vector number is determined if an exception occurs.

AI198 Crash Codes

These codes are specific to the AI198:

Table 9-3 AI198 Crash Codes

Crash Code	Description
0041	Indicates an EE ROM set failure.
0042	Indicates a RAM memory failure.
0043	Indicates a MUX RAM failure.
0044	Indicates a buffer allocation failure.
0045	Indicates an operator-caused fault.
0046	Indicates a bad port state.
0047	Indicates a variable message number fault.
0048-0050	These crash codes are unused.
0051	Indicates the class is missing.
0052	Indicates an SSLC table corrupt.
0053	Indicates a window count fault.
0054	Indicates the DC power is low.
0055	Indicates the dead man timer expired.
0056	Indicates a tandem call failure.
0057	Indicates a stack error.
0058	Indicates a buffer pointer error.
0059	Indicates a buffer free error.
005A	Indicates that the system is reading an EEPROM pointer which points outside EEPROM space.
005B	Indicates the dead man timer buffers are low.
005C	Indicates a bad list pointer.

ASCII Codes

This appendix explains the ASCII codes used when configuring the force connect and disconnect strings in the AI180.

Guide to this Appendix

Table A-1: ASCII Codes

Refer to Table A-1 for codes and descriptions.

Table A-1 ASCII Codes

Code	Description
Null	Has a decimal value of 0. This is reserved as an end-of-string delimiter and cannot be used inside a string.
Control Codes	Has a decimal range of 1 to 31. These characters cause immediate control actions (such as backspacing or carriage returns) and cannot be typed directly into strings. Enter the decimal codes found in Table A-2 by using this format: *<value>* Angle brackets are required for each control character. For example, to include a carriage return and line feed inside a string, substitute: *<13><10>*
Less Than <	This ASCII code (left angle bracket) signals the start of a control code substitution. To include it as regular text, you must use <<. For example: Press the <<Enter> key results in: Press the <Enter> key
Regular Text	Has a decimal range of 32 to 127. These normal characters can be entered from the keyboard without decimal conversion. If you enter regular text in decimal code format, it will revert to standard printable text when the string is evaluated.
Break Space	Has a decimal value of 128. This causes a break space to be transmitted.
Time Codes	This ASCII code a the decimal range of 129 to 255. These are timer values used in some menu items. (See Chapter 4: System Configuration by Menu.)

Table A-2: Decimal Values

Refer to Table A-2 for a list of decimal values.

Table A-2 Decimal Values

Decimal Value	Character (CTRL)	Decimal Value	Character (CTRL)
0	(null/NUL)	1	(^A/SOH)
2	(^B/STX)	3	(^C/ETX)
4	(^D/EOT)	5	(^E/ENQ)
6	(^F/ACK)	7	(^G/Bell)
8	(^H/Backspace)	9	(^I/Horz Tab)
10	(^J/Line Feed)	11	(^K/Vert Tab)
12	(^L/Form Feed)	13	(^M/Carriage Return)
14	(^N/SO)	15	(^O/SI)
16	(^P/DLE)	17	(^Q/DC1)
18	(^R/DC2)	19	(^S/DC3)
20	(^T/DC4)	21	(^U/NAK)
22	(^V/SYN)	23	(^W/ETB)
24	(^X/CAN)	25	(^Y/EM)
26	(^Z/SUB)	27	(ESC)
28	(FS)	29	(GS)
30	(RS)	31	(US)
32	(Space)	33	!
34	"	35	#
36	$	37	%
38	&	39	'
40	(	41	)
42	*	43	+

Table A-2 Decimal Values (Continued)

Decimal Value	Character (CTRL)	Decimal Value	Character (CTRL)
44	,	45	-
46	.	47	/
48	0	49	1
50	2	51	3
52	4	53	5
54	6	55	7
56	8	57	9
58	:	59	;
60	<	61	=
62	>	63	?
64	@	65	A
66	B	67	C
68	D	69	E
70	F	71	G
72	H	73	I
74	J	75	K
76	L	77	M
78	N	79	O
80	P	81	Q
82	R	83	S
84	T	85	U
86	V	87	W
88	X	89	Y
90	Z	91	[
92	\	93	]

Table A-2 Decimal Values (Continued)

Decimal Value	Character (CTRL)	Decimal Value	Character (CTRL)
94	^	95	_
96	`	97	a
98	b	99	c
100	d	101	e
102	f	103	g
104	h	105	i
106	j	107	k
108	l	109	m
110	n	111	o
112	p	113	q
114	r	115	s
116	t	117	u
118	v	119	w
120	x	121	y
122	z	123	{
124	|	125	}
126	~	127	(Delete)

The config Command

This appendix contains summaries that compare the **config** keywords to their menu equivalents. This appendix also includes summaries of **config** commands that are not associated with a menu.

This appendix is designed for an experienced **config** command user. Should you experience any trouble, contact AI Technical Support by phone at (800) 246-7852, or by email at

aiinet@custhelp.com

Guide to this Appendix

Overview

The **config** command allows you to make changes to the AI180 configuration without using the menu system. This is accomplished by typing in the **config** command, followed by a series of arguments (keywords).

It will help to remember that **config** is very closely related to the menu system. The keywords identify which menu and menu item you wish to configure and which value you wish to select for it. The format for this command is:

config [*menu item***[=***value***]...]**

Menu Keywords

The *menu* argument specifies the menu path for the menu items being configured. Each menu and submenu that appears in the menu system (see Chapter 4: System Configuration by Menu) has an equivalent keyword for the **config** command.

Keywords for each menu level are shown at the top of each table. The standard menu name is shown to the right of the keywords so that you can find them quickly.

Example:

The keywords for Menu 1.1 are **system logsat**, making this the first portion of your command:

config system logsat *item***[=***value***]...]**

Item Keywords

Keywords are also used for the *item* argument. These are found in the tables shown in front of their equivalent menu text. Menu items shown with plus (+) after the menu item number are actually submenus and will have their own table following the current table.

Example:

You could turn the alarm log on with this **config** command:

config system logsat logtrn = on

Special Keywords

The **config ?** keyword is a special keyword used to view the valid keywords available for a specific menu argument.

config ? (Help)

There is a **?** command that displays the keywords available for any menu argument you supply. Enter the following to display the valid keywords for a specified menu:

config [*menu***] ?**

menu specifies the menu name for which **config** help is requested. (See the section config Commands Associated with Menus on page B-6.)

If no menu is specified, the command returns the **config** keywords for the Main Menu menu items.

The help option is only a request for information. The command line entered is not saved and does not affect the system configuration.

Example:

Type the following to display the keywords for Menu 4:

```
config card ?,
```

Valid Values

Always check to be sure you are entering valid values for each menu item. Refer to Chapter 4: System Configuration by Menu for a list of menu items and acceptable values.

Delimiters

Keywords must be separated. Use any of the symbols shown in Table B-1 as separators.

Table B-1 Delimiter Descriptions

Delimiter Description	Character
Plus sign	(+)
Comma	(,)
Equal sign	(=)
Ampersand	(&)
Space	( )

All delimiters are treated equally by the CLC.

Strings

When a menu item requires a string argument, the string portion of the text must be terminated with a null character. This is so the system can find the end of your text entry. To include the required null character, add the numeral 0 to the end of your string:

```
<0>
```

The angle brackets are required. Refer to Appendix A: ASCII Codes for more information on embedding control characters.

Menu Items by Number

The menu item number may be specified in place of the menu item keyword. This is particularly useful for quickly entering configuration data in Menu 1.9.2, the reconfiguration strings.

Example:

```
config system logsat 1=on
```

Some menu items have numeric keywords which can be confused with menu item numbers. If the menu of interest has a numeric keyword with the same value as the line number you want to enter, place a pound sign (#) before the menu item number to differentiate. Refer to Table B-2 for an example.

Table B-2 Item Argument and Result

Item Argument	Result
2	This selects 2 stop bits because 2 is a keyword. This does not select menu item 2 from the menu.
#2	The pound sign (#) indicates menu item 2 on the menu, which is 1.5 stop bits.

Prerequisite Menu Items

As in the regular menu system, some menu items cannot be properly configured unless other menu items have been specified first. For instance, a destination name must be specified in menu item 2.1 before a destination message has any meaning in menu item 2.15.1.

Such menu items must be specified together in the same **config** command.

Example:

Create the message 1234 for destination name XDOT like this:

```
config dest name=xdot,more mesg=1234<0>
```

This example has two noteworthy features:

- A delimiter was used to differentiate the menu levels.
- Note that the message is a string value. As such, it is terminated by an ASCII null character.

See the requirements for each menu item.

Multiple Menu Items

Once a menu has been specified, multiple menu items on the same level or below can be configured with the same command.

Example:

This command turns the alarm log on and sets the port:

```
config system logsat logtrn=on logprt=4
```

Precautions for Configuring a Range of Ports

There are special considerations when using the **port** keyword to modify parameters for a range of ports.

Additional keywords used to change port parameters (such as baud rate, stop bits, parity, and so on.) will affect every port in the specified range.

Example:

Ports 0, 1, and 2 are all configured with different communication parameters:

Table B-3 Configuring a Range of Ports Example 1

Port	Speed	Bits/Character	Stop Bits	Parity
Port 0	9600	8	2	Even
Port 1	4800	7	1	Odd
Port 2	1200	5	0	None

Enter the following to change the baud rates.

```
config card bport=0 htype=dumb port=0-2 speed=4800
```

The above command sequence would result in the following:

Table B-4 Configuring a Range of Ports Example 2

Port	Speed	Bits/Character	Stop Bits	Parity
Port 0	4800	8	2	Even
Port 1	4800	8	2	Even
Port 2	4800	8	2	Even

The specified parameter (speed) is modified, and the resulting configuration for the first port is copied to the other ports in the range.

config Commands Associated with Menus

This section includes a complete list of the **config** keywords in menu order. Each menu title includes the keyword for that menu. A list of menu item keywords and the menu text for each follows.

A plus sign (+) after a menu item number indicates the presence of submenus. Each submenu has its own set of menu items and is detailed in its own list.

Table B-5 Main Menu Keyword Listing

Keyword	Description
system	01+Configure options affecting the system as a whole
dest	02+Create, delete, or modify a destination name
card	04+Configure cards
rest	05+Set or remove connection restrictions based on port numbers
slot	07+Configure slot density
alias	08+Configure the alias translation table
bootp	10+Configure the BOOTP table

Table B-6 Menu 1 Keyword Listing

Keyword	Description
logsat	01 +Set log and alarm thresholds
lgcon	02 The display of connection information on user terminals is turned
brksiz	03 The duration of a long break sequence in 1/64 seconds
abd	04 The automatic baud rate detection system is turned
menu	05 Printing of a destination name menu on user terminals is turned
downsp	06 Allow ports of different speeds to be connected (down speed)
sysdna	07 The designator for this node is
cpuswt	08 Allow dual CPUs to automatically switch if fault
string	09+AIswitch automatic commands
dstcol	10 The display of destination names in four columns is turned
autocc	11 Automatic CLC update is

Table B-6 Menu 1 Keyword Listing (Continued)

Keyword	Description
banner	15+Configure banner
sntp	16+SNTP Configuration
lsecur	17+Login Security Configuration
trapin	18 Interval of the faulted primary CLC trap (0...65535 min)

Table B-7 Menu 1.1 Keyword Listing

Keyword	Description
logtrn	01*The activity and alarm log is turned
logprt	02 The activity and alarm log prints on port number
logast	03 Activity log severity threshold is
minmin	04 Minimum minor alarm severity threshold is
maxmin	05 Maximum minor alarm severity threshold is
minmaj	06 Minimum major alarm severity threshold is
maxmaj	07 Maximum major alarm severity threshold is
baud	08+Craft baud rate is 9600 baud
cftlog	09*Craft log echoing default is
caaml	10 CAAML routing string
cmlidl	11 CAAML idle timer (1..255 sec, 0=disabled)
cmlrty	12 CAAML retry timer (1..255 sec, 0=disabled)

Table B-8 Menu 1.1.8 Keyword Listing

Keyword	Description
50	01 Craft baud rate is 50 baud
75	02 Craft baud rate is 75 baud
110	03 Craft baud rate is 110 baud
134	04 Craft baud rate is 134.5 baud

Table B-8 Menu 1.1.8 Keyword Listing (Continued)

Keyword	Description
300	05 Craft baud rate is 300 baud
600	06 Craft baud rate is 600 baud
1200	07 Craft baud rate is 1200 baud
2400	08 Craft baud rate is 2400 baud
3600	09 Craft baud rate is 3600 baud
4800	10 Craft baud rate is 4800 baud
7200	11 Craft baud rate is 7200 baud
9600	12 Craft baud rate is 9600 baud
19200	13 Craft baud rate is 19200 baud
38K	14 Craft baud rate is 38.4K baud
57K	15 Craft baud rate is 57.6K baud

Table B-9 Menu 1.9 Keyword Listing

Keyword	Description
rstcmd	01+AIswitch commands issued upon restart
inicmd	02+AIswitch commands issued after configuration reset

Table B-10 Menu 1.9.1 Keyword Listing

Keyword	Description
str	01 through 14

Using the str Keyword

Menus 1.9.1, 1.9.2, and 4.18 provide multiple lines for entering initialization strings. To enter an initialization string using the config command, use this syntax:

config *menu_string* **str** *strnum string*

The command line arguments are:

menu_string	The keyword string necessary to arrive at the desired menu: 1.9.1 = **system string rstcmd** 1.9.2 = **system string inicmd** 4.18 = **card inistr**
strnum	The row number of the string
string	The initialization string, ended with <0>

For example, to execute the time command after a reset (menu 1.9.1), you might use the following command:

```
config system string rstcmd str 1 time<0>
```

Remember, the **<0>** is required so that the AI198 can find the end of the string.

If you want to clear all of the initialization strings in this menu, use a **c** in place of the strnum argument, like this:

```
config system string rstcmd str c
```

This will clear the contents of all 14 rows of menu 1.9.1.

Table B-11 Menu 1.9.2 Keyword Listing

Keyword	Description
str	01 through 14

Table B-12 Menu 1.12 Keyword Listing

Keyword	Description
baseip	01 CLC IP address (0.0.0.1..255.255.255.254)
router	02 CLC router address (0.0.0.0..255.255.255.254)
subnet	03 CLC Subnet mask (0.0.0.1..255.255.255.254)
telprt	04 Telnet server port number (1..65535)
ftpprt	05 FTP server control port number (1..65535)
read	06 Read Community Name
write	07 Write Community Name
name	08 SNMP Node Name

Table B-12 Menu 1.12 Keyword Listing (Continued)

Keyword	Description
contac	09 SNMP Contact Person
locat	10 SNMP Location

Table B-13 Menu 1.13 Keyword Listing

Keyword	Description
tdf1	01 Time and Date format is hh:mm:ss mmddyy
tdf2	02 Time and Date format is hh:mm:ss mm/dd/yy
tdf3	03 Time and Date format is hh:mm:ss mmddccyy
tdf4	04 Time and Date format is hh:mm:ss mm/dd/ccyy
tdf5	05 Time and Date format is hh:mm:ss ddmmyy
tdf6	06 Time and Date format is hh:mm:ss dd/mm/yy
tdf7	07 Time and Date format is hh:mm:ss ddmmccyy
tdf8	08 Time and Date format is hh:mm:ss dd/mm/ccyy
tdf9	09 Time and Date format is ccyymmdd hh:mm:ss
tdf10	10 Time and Date format is ccyy/mm/dd hh:mm:ss
tdf11	11 Time and Date format is hh:mm:ss dddccyy
tdf12	12 Time and Date format is hh:mm:ss ddd/ccyy
tdf13	13 Time and Date format is ccyyddd hh:mm:ss
tdf14	14 Time and Date format is mmm dd ccyy hh:mm:ss

Table B-14 1.15 Keyword Listing

Keyword	Description
str1	01
str2	02
str3	03
str4	04

Table B-14 1.15 Keyword Listing

Keyword	Description
str5	05
str6	06
str7	07
str8	08
str9	09
str10	10
str11	11
str12	12
str13	13
str14	14
str15	15

Table B-15 Menu 1.16 Keyword Listing

Keyword	Description
zone	01 Time Zone
saving	02*Daylight Savings
snpt	03*SNTP
addr1	04 SNTP Server Primary Address
addr2	05 SNTP Server Secondary Address
poll	06 Poll Interval (1-65535 minutes)

Table B-16 Menu 1.17 Keyword Listing

Keyword	Description
radius	01+Radius Configuration
tacacs	02+TACACS+ Configuration

Table B-17 Menu 1.17.1 Keyword Listing

Keyword	Description
status	01*RADIUS Status (Disabled, Local Fallback, Enabled)
addr1	02 RADIUS Server Primary Address
rport1	03 RADIUS Server Primary Port (1..65535)
secrt1	04 Primary RADIUS Server's Secret
addr2	05 RADIUS Server Secondary Address
rport2	06 TACACS Server Secondary Port (1..65535)
secrt2	07 Secondary RADIUS Server's Secret

Table B-18 Menu 1.17.2 Keyword Listing

Keyword	Description
status	01*TACACS+ Status (Disabled, Local Fallback, Enabled)
addr1	02 TACACS+ Server Primary Address
tport1	03 RADIUS Server Primary Port (1..65535)
scrt1	04 Primary RADIUS Server's Secret
addr2	05 RADIUS Server Secondary Address
tport2	06 RADIUS Server Secondary Port (1..65535)
secrt2	07 Secondary RADIUS Server's Secret

Table B-19 Menu 2 Keyword Listing

Keyword	Description
name	01 The destination name to add, change, or delete
ring	02 Ports in this destination are connected via ring simulation
contmr	03 How long to wait for host answer if using ring simulation
que	04 Allow a user to wait for a free port if all ports are busy
spawn	05 Allow devices connected to this destination to initiate calls
disc	06 Disable the user's disconnect key(s) when connected here

Table B-19 Menu 2 Keyword Listing (Continued)

Keyword	Description
list	07 Display this destination name in the menu
check	08 Check baud rates before connecting to this destination
trunk	09 If ON the destination is another data switch
tmo	10 If ON the timer is an activity timer, OFF is session timer
durtmr	11 Duration of session or activity timer, or 0=OFF
dsctmr	12 Time to wait before using the port again after disconnect
psw	13 Destination password
qpsw	14 Shell/Queue-override password
more	15+Set additional destination features
delete	19 Delete this destination name

Table B-20 Menu 2.15 Keyword Listing

Keyword	Description
mesg	01 Menu message string
cforce	02 A string to be forced to these ports at connect time
dforce	04 A string to be forced to these ports at disconnect time

Table B-21 Menu 4: Keyword Listing

Keyword	Description
bport	01 The baseport of the card to edit is
htype	02+Configure as
dst	03 The card destination name is
desc	04 The card description is
reset	05*Card is included when * is used with STPSLC, DISABL, or ENABLE
inistr	18+Card initialization strings

Table B-22 Menu 4.2 Keyword Listing

Keyword	Description
empty	01 Configure as Empty Slot
dumb	02+Configure as AI183/185 standard 4/16 port card
ether	03+Configure as AI193/194 Ethernet card with slot expansion of
x25	04+Configure as AI192/196 X.25 network card with slot expansion of
asp	05+Configure as ASP or Advanced Interface Card with slot expansion of
indpnd	06 Configure as AI196-I network card with LocalView
ai2524	07 Configure as AI2524 Router card
ai294	08 Configure as AI294 Ethernet Switch card
ai196i	09+Configure as AI196-I network interface card with menu support
islc	10 Configure as Independent Smart Line Card
ai296	11+Configure as AI296 network interface card
x25m	12+Configure as AI192/196 with full menu support
ai285	13+Configure as AI285 network interface card
ai232	14+Configure as AI232 network interface card
ai070	15 Configure as AI Modem
aiflx	16 Configure as AIflex Fiber LAN Extender Card
ai120	17 Configure as AI120 Card
aie1	18 Configure as AIE1 Card
aitc	19 Configure as AITC Card
focus	1 Configure as AIfocus Ethernet Switch Line Card
wane1	02+Configure as AIwan E1 Ethernet Extension Line Card
want1	03+Configure as AIwan T1 Ethernet Extension Line Card

Table B-23 Menu 4.2.2 Keyword Listing

Keyword	Description
port	01 Port number (0-15) for card at baseport
type	02+Call can be placed from this port
abd	03*Automatic baud rate detection for this port is
speed	04+If autobaud is OFF this port operates at
bits	05+Port set for 8 bits per character
stop	06+Port set for 1 stop bit
parity	07+Port set for NO parity
echo	08*Automatic echo of characters
menu	09*Destination menu displayed on this port
hold	10*Port able to place call(s) on hold
brkdsc	11+Disconnect via break
eiadsc	12+Disconnect via EIA signal
more	13+Set the state of EIA pins for idle and connect
desc	14 The port description/address is
reset	15*Port is included when * is used with DISABL or ENABL

Table B-24 Menu 4.2.2.2 Keyword Summary

Keyword	Description
kcs	01 Call can be placed from this port
dst	02 Port is a destination with name
dcs	03 Port auto-calls to destination when a <CR> is received
ded	04 This port automatically connects to port number

Table B-25 Menu 4.2.2.4 Keyword Summary

Keyword	Description
50	01 If autobaud is OFF this port operates at 50 baud

Table B-25 Menu 4.2.2.4 Keyword Summary (Continued)

Keyword	Description
75	02 If autobaud is OFF this port operates at 75 baud
110	03 If autobaud is OFF this port operates at 110 baud
134	04 If autobaud is OFF this port operates at 134.5 baud
150	05 If autobaud is OFF this port operates at 150 baud
300	06 If autobaud is OFF this port operates at 300 baud
600	07 If autobaud is OFF this port operates at 600 baud
1200	08 If autobaud is OFF this port operates at 1200 baud
1800	09 If autobaud is OFF this port operates at 1800 baud
2000	10 If autobaud is OFF this port operates at 2000 baud
2400	11 If autobaud is OFF this port operates at 2400 baud
3600	12 If autobaud is OFF this port operates at 3600 baud
4800	13 If autobaud is OFF this port operates at 4800 baud
7200	14 If autobaud is OFF this port operates at 7200 baud
9600	15 If autobaud is OFF this port operates at 9600 baud
19200	16 If autobaud is OFF this port operates at 19200 baud

Table B-26 Menu 4.2.2.5 Keyword Listing

Keyword	Description
5	01 Port set for 5 bits per character
6	02 Port set for 6 bits per character
7	03 Port set for 7 bits per character
8	04 Port set for 8 bits per character (normal setting)

Table B-27 Menu 4.2.2.6 Keyword Listing

Keyword	Description
1	01 Port set for 1 stop bit

Table B-27 Menu 4.2.2.6 Keyword Listing (Continued)

Keyword	Description
1P5	02 Port set for 1.5 stop bits
2	03 Port set for 2 stop bits

Table B-28 Menu 4.2.2.7 Keyword Listing

Keyword	Description
even	01 Port set for EVEN parity
odd	02 Port set for ODD parity
none	03 Port set for NO parity

Table B-29 Menu 4.2.2.11 Keyword Listing

Keyword	Description
none	01 Disconnect via break or long break is disabled
brk	02 Disconnect via break is enabled
lbrk	03 Disconnect via long break is enabled

Table B-30 Menu 4.2.2.12 Keyword Listing

Keyword	Description
none	01 Disconnect via EIA signal or pass EIA signal is disabled
pass	02 Pass DSR to RTS is enabled
dsr	03 Disconnect immediately when DSR goes off
ldsr	04 Disconnect only when DSR goes from ON to OFF is enabled
dcd	05 Disconnect immediately when DCD goes off
ldcd	06 Disconnect only when DCD goes from ON to OFF is enabled

Table B-31 Menu 4.2.2.13 Keyword Listing

Keyword	Description
rtsidl	01*The state of the EIA lead RTS when disconnected is

Table B-31 Menu 4.2.2.13 Keyword Listing (Continued)

Keyword	Description
dtridl	02*The state of the EIA lead DTR when disconnected is
rtscon	03*The state of the EIA lead RTS when connected is
dtrcon	04*The state of the EIA lead DTR when connected is
rtstog	05*When disconnecting toggle the EIA lead RTS is
dtrtog	06*When disconnecting toggle the EIA lead DTR is

Table B-32 Menu 4.2.3 Keyword Listing

Keyword	Description
baseip	01 Base IP address (0.0.0.1..255.255.255.254)
rngip	02 Maximum range of low-order IP address byte (0..255)
dnsip1	03 Domain name server # 1 IP address (0.0.0.0..255.255.255.254)
dnsip2	04 Domain name server # 2 IP address (0.0.0.0..255.255.255.254)
snmp1	05 SNMP client # 1 trap IP address (0.0.0.0..255.255.255.254)
snmp2	06 SNMP client # 2 trap IP address (0.0.0.0..255.255.255.254)
gatwa1	07 IP gateway # 1 address (0.0.0.0..255.255.255.254)
gatwa2	08 IP gateway # 2 address (0.0.0.0..255.255.255.254)
perfrm	09+Set Ethernet performance parameters
domstr	10 Default domain description string
destry	12*Disconnection destroys buffered data
descr	13+Port descriptions

Table B-33 Menu 4.2.3.9 Keyword Listing

Keyword	Description
retryt	01 Call retry timer (1..255 sec)
subnet	02 Subnet mask (0.0.0.1..255.255.255.254)
retran	03 Retransmit timeout value (1..255 55 ms ticks)

Table B-33 Menu 4.2.3.9 Keyword Listing (Continued)

Keyword	Description
maxrnd	04 Maximum roundtrip timeout (1..255 sec)
minrnd	05 Minimum roundtrip timeout (1..255 55 ms ticks)
domain	06 Domain name server timeout (1..255 sec)
cachet	07 IP cache time (1..255 min)
arprep	08 ARP reply timeout (1..255 sec)
maxrxp	09 Maximum receive packet size (1..64 16 byte paragraphs)
maxtxp	10 Maximum transmit packet size (1..64 16 byte paragraphs)
maxseg	11 Maximum segment size (1..64 16 byte paragraphs)
noack	12 Maximum number of bytes without an ACK (1..64 16 byte paragraphs)
window	13 Window size (1..64 16 byte paragraphs)
intrnt	14 Internet control message size (1..64 16 byte paragraphs)

Table B-34 Menu 4.2.3.13

Keyword	Descriptions
num	1 through 24 Port description numbers

Table B-35 Menu 4.2.4 Keyword Listing

Keyword	Description
lnknum	01 Link number to set with these parameters (1..4)
pvclo	02 Minimum LCN set aside for PVC use (0..255)
pvchi	03 Maximum LCN set aside for PVC use (0..255)
svclo	04 Minimum LCN set aside for SVC use (0..255)
svchi	05 Maximum LCN set aside for SVC use (0..255)
baud	06+Baud rate is internal at 9600
lnkcfg	07+CCITT link is (DCE) with active disconnect

Table B-35 Menu 4.2.4 Keyword Listing (Continued)

Keyword	Description
maxpak	08+Maximum packet size is 128
frmmod	09+Frame level modulus is 8
frmk	10 Frame level window variable k is
t1tmr	11 T1 timer (2..200 tenths of a sec)
n2cntr	12 N2 counter (2..32)
pakmod	13+Packet level modulus is 8
pakw	14 Packet level window variable W is
paktmr	15 Packetizing timer (0..255 hundredths of sec)
proto	16+Protocol processing is
faclty	17+Set X.25 facilities
link	18*Link is

Table B-36 Menu 4.2.4.6 Keyword Listing

Keyword	Description
ext	01 Baud rate is bit synchronized by external clock
1200	02 Baud rate is internal at 1200
2400	03 Baud rate is internal at 2400
4800	04 Baud rate is internal at 4800
9600	05 Baud rate is internal at 9600
19200	06 Baud rate is internal at 19200
38400	07 Baud rate is internal at 38400
56000	08 Baud rate is internal at 56000
64000	09 Baud rate is internal at 64000
128000	10 Baud rate is internal at 128000

Table B-37 Menu 4.2.4.7 Keyword Listing

Keyword	Description
cta	01 CCITT link is (DTE) with active disconnect
cca	02 CCITT link is (DCE) with active disconnect
ctp	03 CCITT link is (DTE) with passive disconnect
ccp	04 CCITT link is (DCE) with passive disconnect
dta	05 DDN Link is (DTE) with active disconnect
dca	06 DDN Link is (DCE) with active disconnect
dtp	07 DDN Link is (DTE) with passive disconnect
dcp	08 DDN Link is (DCE) with passive disconnect

Table B-38 Menu 4.2.4.8 Keyword Listing

Keyword	Description
128	01 Maximum packet size is 128
256	02 Maximum packet size is 256
512	03 Maximum packet size is 512
1024	04 Maximum packet size is 1024

Table B-39 Menu 4.2.4.9 Keyword Listing

Keyword	Description
8	01 Frame level modulus is 8
128	02 Frame level modulus is 128

Table B-40 Menu 4.2.4.13 Keyword Listing

Keyword	Description
8	01 Packet level modulus is 8
128	02 Packet level modulus is 128

Table B-41 Menu 4.2.4.16 Keyword Listing

Keyword	Description
xonxof	01*X-ON / X-OFF flow control is
nma	02*NMA communications protocol
opsine	03*OPS/INE communications protocol
tl1	04*TL1 Packetizing

Table B-42 Menu 4.2.4.17 Keyword Listing

Keyword	Description
t2tmr	01 Response timer T2 is (0..255 tenths of a sec)
t3tmr	02 Idle link disconnect timer T3 is (0..255 sec)
t20tmr	03 Restart request timer T20 is (0..255 sec)
ccr	10 T1 transceiver CCR -- common control register
tcr	11 T1 transceiver TCR -- transmit control register
rcr	12 T1 transceiver RCR -- receive control register
t1lbo	13+Line build out -- DSX-1 crossconnect; 133 to 266 feet (40 to 80 meters)
fandp	14 Special frame and packet features bit mask is (0000..ffff hex)
nego	15 Negotiation facilities bit mask is (0000..ffff hex)
charge	16 Charging facilities bit mask is (0000..ffff hex)
misc	17 Miscellaneous facilities bit mask is (0000..ffff hex)

Table B-43 Menu 4.2.4.17.13 Keyword Listing

Keyword	Description
1	01 Line build out -- DSX-1 crossconnect; 0 to 133 feet (0 to 40 meters)
2	02 Line build out -- DSX-1 crossconnect; 133 to 266 feet (40 to 80 meters)
3	03 Line build out -- DSX-1 crossconnect; 266 to 399 feet (80 to 120 meters)

Table B-43 Menu 4.2.4.17.13 Keyword Listing (Continued)

Keyword	Description
4	04 Line build out -- DSX-1 crossconnect; 399 to 533 feet (120 to 160 meters)
5	05 Line build out -- DSX-1 crossconnect; 533 to 655 feet (160 to 200 meters)

Table B-44 Menu 4.2.9 Keyword Listing

Keyword	Description
ipadr	01 IP Address (0.0.0.1 - 255.255.255.254)
iprng	02 IP Address Range (0-255)
ipmsk	03 IP Subnet Mask (0.0.0.1 - 255.255.255.254)
iprtr1	04 Primary IP Router Address 0.0.0.0 - 255.255.255.254)
iprtr2	05 Secondary IP Router Address 0.0.0.0 - 255.255.255.254)
tcpwin	06*TCP Default Window Size (200, 512, 1024, 2048)
tcpsnd	07*TCP Send Ahead
snmp	08+SNMP System Parameters
pasclr	09*Bring passive link down when all calls have cleared
passmt	10 Passive link Stay Inactive timer
passit	11 Passive link Standby Mode timer
link	12+Link Setup See Table B-45 and Table B-48 for more information on specifying X25 and asynchronous ports with this keyword.
ipx25,add	13+IP Over X.25 Subnets
ipstat, add	14+IP Static Routes
tlnprt	15 Telnet port number (1..65534)

Table B-45 Menu 4.2.9.8 Keyword Listing

Keyword	Description
contac	01 Contact person for this node
name	02 Node name
locat	03 Node location
sndtrp	04*Send authentication traps

Table B-46 Menu 4.2.9.12 X.25 Link Setup Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02 Link type (Async, X25)
descr	03 Link description
state	04 Link state (Enabled, Disabled)
mode	05*Link mode (Normal, Passive, Extended)
speed	06 Port speed (0 - 64000 bps, 0 is external clocking)
lapb	07+X25 LAPB Parameters
X25par	08+X25 Parameters
vircir	09+Virtual Circuits

Table B-47 Menu 4.2.9.12.7 Keyword Listing

Keyword	Description
intmod	01*Interface mode (DTE or DCE)
frmdsc	02*Frame level disconnect (Active, Passive, Other)
frmwin	03 Frame Window size (1-7)
n2	04 N2 retry count (0 - 255)
t1	05 T1 ack timer (1-25500 ms)
t2	06 T2 ack delay timer (1-25500 ms)
t4	07 T4 idle timer (0-200000 ms)

Table B-48 Menu 4.2.9.12.8 Keyword Listing

Keyword	Description
facneg	01*X25 facilities negotiation
pktsiz	02*Max packet size (128, 256, 512)
pktwin	03 Packet window size (1-7)
x121ad	04 X121 local address (0-15 decimal digits)
t20	05 T20 restart timer (0-3200000ms)
t21	06 T21 call timer (0-3200000ms)
t22	07 T22 reset timer (0-3200000ms)
t23	08 T23 clear timer (0-3200000ms)
t24	09 T24 window timer (0-3200000ms)
t25	10 T25 data retransmission timer (0-3200000ms)
t26	11 T26 interrupt timer (0-3200000ms)
t28	12 T28 registration timer (0-3200000ms)
r20	13 R20 restart count (0-255)
r22	14 R22 reset transmission count (0-255)
r23	15 R23 clear retransmission count (0-255)
r28	16 R28 registration retransmission count (0-255)
prover	17*Protocol version (1980, 1984, 1988)

Table B-49 Menu 4.2.9.12.9 Keyword Listing

Keyword	Description
numpvc	01 Number of PVCs (0-1024)
pvc,add	02+PVC configuration
inlow	03 Incoming only SVC low (0-4095)
inhig	04 Incoming only SVC high (0-4095)
twolow	05 Two-way SVC low (0-4095)

Table B-49 Menu 4.2.9.12.9 Keyword Listing (Continued)

Keyword	Description
twohig	06 Two-way SVC high (0-4095)
outlow	07 Outgoing only SVC low (0-4095)
outhig	08 Outgoing only SVC high (0-4095)

Table B-50 Menu 4.2.9.12.9.2.1 PVC Edit Menu Keyword Listing

Keyword	Description
type	01*PVC Type (Passive, Active, Connect on activity)
lcnlow	02 LCN Low (* for all LCNs for the link)
lcnhig	03 LCN High
tmrval	04 RESET Timer Interval (seconds)

Table B-51 Menu 4.2.9.12 Asynchronous Link Setup Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02 Link type (Async, X25)
descr	03 Link description
state	04*Link state (Enabled, Disabled)
speed	05+Port Speed
datbit	06*Port Data Bits (7, 8)
stpbit	07*Port Stop Bits (1, 2)
parity	08*Port Parity (None, Odd, Even)
flwcon	09*Flow Control (None, XonXoff)
pvctyp	10*PVC Type (Passive, Active, Connect on activity)
pvctim	11 Timer Interval (seconds)

Table B-52 Menu 4.2.9.12.5 Keyword Listing

Keyword	Description
300	01 300 Baud
1200	02 1200 Baud
2400	03 2400 Baud
4800	04 4800 Baud
9600	05 9600 Baud
19200	06 19200 Baud
38400	07 38400 Baud
57600	08 57600 Baud

Table B-53 Menu 4.2.9.13.1 Keyword Listing

Keyword	Description
lipadr	01 Local IP address for this subnet
lipmsk	02 Local IP mask for this subnet
lx25ln	03 Local X.25 link number
ripadr	04 Remote IP address for this subnet
rx121	05 Remote X121 address

Table B-54 Menu 4.2.9.14.1 Keyword Listing

Keyword	Description
destip	01 Destination IP
nextip	02 Next Hop IP

Table B-55 Menu 4.2.11 Keyword Listing

Keyword	Description
ipadr	01 IP Address (0.0.0.1 - 255.255.255.254)
iprng	02 IP Address Range (1-255)

Table B-55 Menu 4.2.11 Keyword Listing (Continued)

Keyword	Description
ipmsk	03 Subnet Mask (0.0.0.1 - 255.255.255.254)
iprtr1	04 Primary IP Router Address 0.0.0.0 - 255.255.255.254)
iprtr2	05 Secondary IP Router Address 0.0.0.0 - 255.255.255.254)
tcpwin	06*TCP Default Window Size (200, 512, 1024, 2048)
tcpsnd	07*TCP Send Ahead
snmp	08+SNMP System Parameters
pasclr	09*Bring passive link down when all calls have cleared
passmt	10 Passive link Stay Inactive timer
passit	11 Passive link Standby Mode timer
link	12+Link Setup See Table B-59 and Table B-65 for more information on specifying X.25 and asynchronous ports with this keyword.
ipx25, add	13+IP Over X.25 Subnets
ipstat, add	14+IP Static Routes
tlnprt	15 Telnet port number (1..65534)
ftpprt	16 FTP port number (1..65534)
prompt	17 Prompt String
NEXTPG	19 Next Page

Table B-56 Menu 4.2.11 Pg 2 Keyword Listing

Keyword	Description
10base	01+10 Base T Ethernet
radius	02+Radius Configuration Menu
destbk	03 Destination Menu Break Sequence
tacacs	04+TACACS Configuration Menu

Table B-56 Menu 4.2.11 Pg 2 Keyword Listing

Keyword	Description
tcpout	05 TCP Outgoing Connection Timer (2-360s)

Table B-57 Menu 4.2.11-2.2 and Menu 4.2.11-2.4 Keyword Listing

Keyword	Description
stat1	01*Primary Server Status (Enabled, Disabled)
ip1	02 Primary Server IP Address
tport1	03 Primary Server Port (1..65535)
secrt1	04 Primary Server Secret
stat2	05*Secondary Server Status (Enabled, Disabled)
ip2	06 Secondary Server IP Address
tport2	07 Secondary Server Port (1..65535)
secret2	08 Secondary Server Secret
shell	09*Shell/FTP Radius Option (Enabled, Disabled, Local Fallback) or 09*Shell/FTP TACACS Option (Enabled, Disabled, Local Fallback)

Table B-58 Menu 4.2.11.8 Keyword Listing

Keyword	Description
contac	01 Contact person for this node
name	02 Node name
locat	03 Node location
sndtrp	04*Send authentication traps
read	05 Read Community Name
read2	06 MIB2 Community Name
write	07 Write Community Name

The **config** command accesses keywords for all items in submenu 09, Virtual Circuits, directly from this menu level.

Table B-59 Menu 4.2.11.12 (X.25 Link Setup) Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02*Link type (Async, X25, HDLC, SyncPPP, AsyncPPP, MLT)
descr	03 Link Description
state	04*Link state (Enabled, Disabled)
mode	05*Link mode (Normal, Passive, Extended)
speed	06 Port speed (0 - 128000 bps, 0 is external clocking)
lapb	07+X25 LAPB Parameters
X25par	08+X25 Parameters
vircir	09+Virtual Circuits
hrdwar	10*Hardware Interface (RS232, RS530, V.35)
bx25	11+BX25 Configuration
autod	12 Auto Disable Error Limit (0-1000000)

Table B-60 Menu 4.2.11.12.7 (X.25 Link Setup) Keyword Listing

Keyword	Description
intmod	01*Interface mode (DTE or DCE)
frmdsc	02*Frame level disconnect (Active, Passive, Other)
frmwin	03 Frame Window size (1-7)
n2	04 N2 retry count (0 - 255)
t1	05 T1 ack timer (1-25500ms)
t2	06 T2 ack delay timer (1-25500ms)
t4	07 T4 idle timer (0-200000ms)

Table B-61 Menu 4.2.11.12.8 (X.25 Link Setup) Keyword Listing

Keyword	Description
facneg	01*X25 facilities negotiation

Table B-61 Menu 4.2.11.12.8 (X.25 Link Setup) Keyword Listing (Continued)

Keyword	Description
pktsiz	02*Max packet size (128, 256, 512)
pktwin	03 Packet window size (1-7)
x121ad	04 X121 local address (0-15 decimal digits)
t20	05 T20 restart timer (0-3200000ms)
t21	06 T21 call timer (0-3200000ms)
t22	07 T22 reset timer (0-3200000ms)
t23	08 T23 clear timer (0-3200000ms)
t24	09 T24 window timer (0-3200000ms)
t25	10 T25 data retransmission timer (0-3200000ms)
t26	11 T26 interrupt timer (0-3200000ms)
t28	12 T28 registration timer (0-3200000ms)
r20	13 R20 restart count (0-255)
r22	14 R22 reset transmission count (0-255)
r23	15 R23 clear retransmission count (0-255)
r28	16 R28 registration retransmission count (0-255)
prover	17*Protocol version (1980, 1984, 1988)

Table B-62 Menu 4.2.11.12.9 (X.25 Link Setup) Keyword Listing

Keyword	Description
numpvc	01 Number of PVCs (0-1024)
pvc,add	02+PVC configuration
inlow	03 Incoming only SVC low (0-4095)
inhig	04 Incoming only SVC high (0-4095)
twolow	05 Two-way SVC low (0-4095)
twohig	06 Two-way SVC high (0-4095)

Table B-62 Menu 4.2.11.12.9 (X.25 Link Setup) Keyword Listing (Continued)

Keyword	Description
outlow	07 Outgoing only SVC low (0-4095)
outhig	08 Outgoing only SVC high (0-4095)

Table B-63 Menu 4.2.11.12.9.2.2 (X.25 Link Setup) Keyword Listing

Keyword	Description
type	01*PVC Type (Passive, Active, Connect on activity)
lcnlow	02 LCN Low (* for all LCNs for the link)
lcnhig	03 LCN High
tmrval	04 RESET Timer Interval (seconds)

Table B-64 Menu 4.2.11.12.11 (X.25 Link Setup) Keyword Listing

Keyword	Description
sup	01*BX25 Support (Enabled, Disabled)
use	02*Use these configuration values (Enabled, Disabled)
sun	03 Sending Unit Number (0 - 9)
mod	04 Modulo (5 - 256)
st2	05 Connect Timer ST2 (seconds)
st3	06 Send Timer ST3 (seconds)

Table B-65 Menu 4.2.11.12 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02 Link type (Async, X25, HDLC, SyncPPP, AsyncPPP, MLT)
descr	03 Link description
state	04*Link state (Enabled, Disabled)
speed	05+Port Speed

Table B-65 Menu 4.2.11.12 (Asynchronous Link Setup) Keyword Listing (Continued)

Keyword	Description
datbit	06*Port Data Bits (7, 8)
stpbit	07*Port Stop Bits (1, 2)
parity	08*Port Parity (None, Odd, Even)
flwcon	09*Flow Control (None, XonXoff)
xonint	10 Xon Repeat interval (0-120s with 0= no repeat)
con	11+Connect Options
dis	12+Disconnect Options
lead	13+RTS/DTR Lead Control Options
modem	14+Modem Options
hrdwar	15*Hardware Interface (RS232, RS530, V.35)
autod	16 Auto Disable Error Limit (0-1000000)

Table B-66 Menu 4.2.11.12.5 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
300	01 300 Baud
1200	02 1200 Baud
2400	03 2400 Baud
4800	04 4800 Baud
9600	05 9600 Baud
19200	06 19200 Baud
38400	07 38400 Baud
57600	08 57600 Baud
115k	09 115200 Baud
auto	10 Auto Baud

Table B-67 Menu 4.2.11.12.11 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
applic	01*Link Application (Login, Destination, Alias)
alias	02 Alias
retry	03 Call retry interval (0- 32767 s, 0 = disabled)
dcd	05*Connect when DCD is on
chr	06*Connect when characters are received
direct	07*Connect without DSR, DCD or received characters
string	08 Connect string

Table B-68 Menu 4.2.11.12.12 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
dcd	02*Disconnect when DCD off
break	03*Disconnect when a break character is received
inact	04 Disconnect inactivity timer (0- 32767 s, 0 = disabled)

Table B-69 Menu 4.2.11.12.13 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
dtrcon	01*DTR connect state
dtrdis	02*DTR disconnect state (On, Off, Toggle)
rtscon	03*RTS connect state (On, Off, Flow Control)
rtsdis	04*disconnect state (On, Off, Toggle)

Table B-70 Menu 4.2.11.12.14 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
string	01 Modem string
timout	02 Dialing time out (5- 300 s)
attemp	03 Number of dial attempts (0 - 100, 0 = continuous retry)

Table B-71 Menu 4.2.11.12 (HDLC Link Setup) Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02*Link Type (Async, X25, HDLC, SyncPPP, AsyncPPP, MLT)
descr	03 Link Description
state	04*Link state (Enabled, Disabled)
speed	06 Port speed (0 -128000 bps, 0 is external clocking)
hrdwar	10*Hardware Interface (Rs232, RS530, V.35)
autod	11 Auto Disable Error Limit (0-1000000)

Table B-72 Menu 4.2.11.12 (Synchronous PPP Link Setup) Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02*Link Type (Async, X25, HDLC, SyncPPP, AsyncPPP, MLT)
descr	03 Link Description
state	04*Link state (Enabled, Disabled)
speed	06 Port speed (0 -128000 bps, 0 is external clocking)
auth	07+PPP Authentication Menu
config	08+PPP Configuration Menu
hrdwar	10*Hardware Interface (Rs232, RS530, V.35)
autod	11 Auto Disable Error Limit (0-1000000)

Table B-73 Menu 4.2.11.12.7 (Synchronous PPP Link Setup) Keyword Listing

Keyword	Description
radopt	01*RAS Option (DISABLED,RADIUS,RADIUS_FB,TACACS, TACACS_FB)
lmethd	02*Local Authentication Method (None, PAP, CHAP)
lident	03 Local PAP/CHAP identity

Table B-73 Menu 4.2.11.12.7 (Synchronous PPP Link Setup) Keyword Listing

Keyword	Description
lsecrt	04 Local PAP Password/CHAP Secret
rmethd	05*Remote Authentication Method (None, PAP, CHAP)
rident	06 Remote PAP/CHAP identity
rsecrt	07 Remote PAP Password/CHAP Secret

Table B-74 Menu 4.2.11.12.8 (Synchronous PPP Link Setup) Keyword Listing

Keyword	Description
proto	01*Network Control Protocol (IPCP, BCP)
ip	02 Local IP Address
remote	03 Remote IP Address
subnet	04 Subnet Mask

Table B-75 Menu 4.2.11.12 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02*Link Type (Async, X25, HDLC, SyncPPP, AsyncPPP, MLT)
descr	03 Link Description
state	04*Link state (Enabled, Disabled)
speed	05+Port speed
datbit	06*Port Data Bits (7, 8)
stpbit	07*Port Stop Bits (1, 2)
parity	08*Port Parity (None, Odd, Even)
flwcon	09*Flow Control (None, XonXoff)
xonint	10 Xon Repeat interval (0 - 120s with 0 = no repeat)
con	11+Connect Options
dis	12+Disconnect Options

Table B-75 Menu 4.2.11.12 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
lead	13+RTS/DTR Lead Control Options
modem	14+Modem Options
hrdwar	15*Hardware Interface (RS232,RS530,V.35)
autod	16 Auto Disable Error Limit (0-1000000)

Table B-76 Menu 4.2.11.12.5 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
300	01 300 Baud
1200	02 1200 Baud
2400	03 2400 Baud
4800	04 4800 Baud
9600	05 9600 Baud
19200	06 19200 Baud
38400	07 38400 Baud
57600	08 57600 Baud
115k	09 115200 Baud

Table B-77 Menu 4.2.11.12.11 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
dsr	01 Dial/Connect when DSR is on
dcd	02*Connect when DCD is on

Table B-78 Menu 4.2.11.12.12 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
dsr	01 Disconnect when DSR off
dcd	02*Disconnect when DCD off

Table B-79 Menu 4.2.11.12.13 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
dtrcon	01*DTR connect state
dtrdis	02*DTR disconnect state (On, Off, Toggle)
rtscon	03*RTS connect state (On, Off, Flow Control)
rtsdis	04*RTS disconnect state (On, Off, Toggle)

Table B-80 Menu 4.2.11.12.14 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
string	01 Modem string

Table B-81 Menu 4.2.11.12 (MLT Link Setup) Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02*Link Type (Async, X25, HDLC, SyncPPP, AsyncPPP, MLT)
descr	03 Link Description
state	04*Link state (Enabled, Disabled)
speed	05 Port speed (0 - 128000 bps, 0 is external clocking)
hrdwar	06*Hardware Interface (RS232,RS530,V.35)
sncenc	07*Sync Port Encoding (NRZ, NRZI)
lapb	08+LAPB Parameters
autod	09 Auto Disable Error Limit (0-1000000)

Table B-82 Menu 4.2.11.12.8 (MLT Link Setup) Keyword Listing

Keyword	Description
intmod	01*Interface mode (DTE or DCE)
frmdsc	02*Frame level disconnect (Active, Passive, Other)
frmwin	03 Frame Window size (1 - 7)

Table B-82 Menu 4.2.11.12.8 (MLT Link Setup) Keyword Listing (Continued)

Keyword	Description
n2	04 N2 retry count (0 - 255)
t1	05 T1 ack timer (1 - 25500 ms)
t2	06 T2 ack delay timer (1 - 25500 ms)
t4	07 T4 idle timer (0 - 200000 ms)

Table B-83 Menu 4.2.11.13.1 Keyword Listing

Keyword	Description
lipadr	01 Local IP address for this subnet
lipmsk	02 Local IP mask for this subnet
lx25ln	03 Local X.25 link number
ripadr	04 Remote IP address for this subnet
rx121	05 Remote X121 address

Table B-84 Menu 4.2.11.14.1 Keyword Listing

Keyword	Description
destip	01 Destination IP
nextip	02 Next Hop IP

The **config** command accesses keywords for all submenu items of menu 4.2.12 directly from this menu level.

Table B-85 Menu 4.2.12 Keyword Listing

Keyword	Description
lnknum	01 Link number to set with these parameters (1..16)
96xmip	02 Minimum LCN set aside for PVC use (0..4095)
96xmap	03 Maximum LCN set aside for PVC use (0..4095)
96xslo	04 Minimum LCN set aside for SVC use (0..4095)
96xshi	05 Maximum LCN set aside for SVC use (0..4095)

Table B-85 Menu 4.2.12 Keyword Listing (Continued)

Keyword	Description
96xpsd	06+Baud rate is
96xint	07+CCITT link is (DTE) with active disconnect
96xmpk	08*Maximum packet size (128, 256, 512, 1024)
96xpvc, add	09+PVC configuration
96xfrm	10+Frame level information
96xt1	11 T1 Timer (2..200 tenths of a sec)
96xn2	12 N2 counter (2..32)
96xpkt	13+Packet level information
96xdsc	14 Link Description
96xptm	15 Packetizing Timer (0..255 hundredths of a sec)
96xpcl	16+Protocol processing is
96xfcm	17+Set X.25 facilities
96xsta	18*Link state

Table B-86 Menu 4.2.12.6 Keyword Listing

Keyword	Description
ext	01 externally clocked
1200	02 internally clocked at 1200 baud
2400	03 internally clocked at 2400 baud
4800	04 internally clocked at 4800 baud
9600	05 internally clocked at 9600 baud
19200	06 internally clocked at 19200 baud
38400	07 internally clocked at 38400 baud
56000	08 internally clocked at 56000 baud
64000	09 internally clocked at 64000 baud

Table B-86 Menu 4.2.12.6 Keyword Listing (Continued)

Keyword	Description
128000	10 internally clocked at 128000 baud

Table B-87 Menu 4.2.12.7 Keyword Listing

Keyword	Description
cta	01 CCITT link is (DTE) with active disconnect
cca	02 CCITT link is (DCE) with active disconnect
ctp	03 CCITT link is (DTE) with passive disconnect
ccp	04 CCITT link is (DCE) with passive disconnect
dta	05 DDN link is (DTE) with active disconnect
dca	06 DDN link is (DCE) with active disconnect
dtp	07 DDN link is (DTE) with passive disconnect
dcp	08 DDN link is (DCE) with passive disconnect

Table B-88 Menu 4.2.12.9 Keyword Listing

Keyword	Description
96xptp	01 *PVC Type (Active, Connect on activity, Passive)
96xplo	02 LCN Low (* for all LCNs for the link)
96xphi	03 LCN High (* for all LCNs for the link)
96xptm	04 PVC Timer Interval (seconds)

Table B-89 Menu 4.2.12.10 Keyword Listing

Keyword	Description
96xfmd	01*Frame level modulus (8 or 128) is
96xfws	02 Frame level window size (1..7)

Table B-90 Menu 4.2.12.13 Keyword Listing

Keyword	Description
96xpmd	01*Packet level modulus (8 or 128) is
96xpws	02 Packet level window size (1..7)

Table B-91 Menu 4.2.12.16 Keyword Listing

Keyword	Description
96xpxo	01*X-On/X-Off
96xpnm	02*NMA Communications
96xpop	03*OPS/INE
96xtl1	04*TL1 Packetizing

Table B-92 Menu 4.2.12.17 Keyword Listing

Keyword	Description
96xt2	01 Response timer T2
96xt3	02 Idle link disconnect timer T3
96xt20	03 Restart request T20 timer
96xccr	10 T1 Transceiver CCR
96xtcr	11 T1 transceiver TCR
96xrcr	12 T1 transceiver RCR
96xlbo	13 Line Build Out
96xfrp	14 Special feaures bit mask
96xneg	15 Negotiation facilities bit mask
96xchg	16 Charging facilities bit mask
96xfms	17 Misc. facilities bit mask

Table B-93 Menu 4.2.12.17.13 Keyword Listing

Keyword	Description
0	01 Line build out -- DX1 crossconnect; 0 to 133 feet
133	02 Line build out -- DX1 crossconnect; 133 to 266 feet
266	03 Line build out -- DX1 crossconnect; 266 to 399 feet
399	04 Line build out -- DX1 crossconnect; 399 to 533 feet
533	05 Line build out -- DX1 crossconnect; 533 to 655 feet

The **config** command accesses keywords for all submenu items of menu 4.2.13 directly from this menu level.

Table B-94 Menu 4.2.13 Keyword Listing

Keyword	Description
ipadr	01 IP Address (0.0.0.1 - 255.255.255.254)
iprng	02 IP Address Range (1-255)
ipmsk	03 Subnet Mask (0.0.0.1 - 255.255.255.254)
iprtr1	04 Primary IP Router Address 0.0.0.0 - 255.255.255.254)
iprtr2	05 Secondary IP Router Address 0.0.0.0 - 255.255.255.254)
tcpwin	06*TCP Default Window Size (200, 512, 1024, 2048)
tcpsnd	07*TCP Send Ahead
snmp	08+SNMP System Parameters
link	12+Link Setup See Table B-96 for more information on specifying asynchronous ports with this keyword.
ipstat, add	14+IP Static Routes
tlnprt	15 Telnet port number (1..65534)
frpprt	16 FTP port number (1..65534)
prompt	17 Prompt String

Table B-95 Menu 4.2.13.8 Keyword Listing

Keyword	Description
contac	01 Contact person for this node
name	02 Node name
locat	03 Node location
sndtrp	04*Send authentication traps
read	05 Read Community Name
read2	06 MIB2 Community Name
write	07 Write Community Name

Table B-96 Menu 4.2.13.12 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
number	01 Link number (1-16)
type	02 Link type
descr	03 Link description
state	04*Link state (Enabled, Disabled)
speed	05+Port Speed
datbit	06*Port Data Bits (7, 8)
stpbit	07*Port Stop Bits (1, 2)
parity	08*Port Parity (None, Odd, Even)
flwcon	09*Flow Control (None, XonXoff)
xonint	10 Xon Repeat interval (0 - 120s with 0 = no repeat)
con	11+Connect Options
dis	12+Disconnect Options
lead	13+RTS/DTR Lead Control Options
modem	14+Modem Options

Table B-97 Menu 4.2.13.12.5 Keyword Listing

Keyword	Description
300	01 300 Baud
1200	02 1200 Baud
2400	03 2400 Baud
4800	04 4800 Baud
9600	05 9600 Baud
19200	06 19200 Baud
38400	07 38400 Baud
57600	08 57600 Baud
115k	09 115200 Baud

Table B-98 Menu 4.2.13.12.11 Keyword Listing

Keyword	Description
applic	01*Link Application (Login, Destination, Alias)
alias	02 Alias
retry	03 Call retry interval (0 - 32767 s, 0 = disabled)
dcd	05*Connect when DCD is on
chr	06*Connect when characters are received
direct	07*Connect without DSR, DCD or received characters
string	08 Connect string

Table B-99 Menu 4.2.13.12.12 Keyword Listing

Keyword	Description
dcd	02*Disconnect when DCD off
break	03*Disconnect when a break character is received
inact	04 Disconnect inactivity timer (0 - 32767 s, 0 = disabled)

Table B-100 Menu 4.2.13.12.13 Keyword Listing

Keyword	Description
dtrcon	01*DTR connect state
dtrdis	02*DTR disconnect state (On, Off, Toggle)
rtscon	03*RTS connect state (On, Off, Flow Control)
rtsdis	04*disconnect state (On, Off, Toggle)

Table B-101 Menu 4.2.13.12.14 Keyword Listing

Keyword	Description
string	01 Modem string
timout	02 Dialing time out (5- 300 s)
attemp	03 Number of dial attempts (0 - 100, 0 = continuous retry)

Table B-102 Menu 4.2.13.14.1 Keyword Listing

Keyword	Description
destip	01 Destination IP
nextip	02 Next hop IP

Table B-103 Menu 4.2.14 pg 1 Keyword Listing

Keyword	Description
ipadr	01 IP Address (0.0.0.1 - 255.255.255.254)
iprng	02 IP Address Range (1-255)
ipmsk	03 Subnet Mask (0.0.0.1 - 255.255.255.254)
iprtr1	04 Primary IP Router Address 0.0.0.0 - 255.255.255.254)
iprtr2	05 Secondary IP Router Address 0.0.0.0 - 255.255.255.254)
tcpwin	06*TCP Default Window Size (200, 512, 1024, 2048)
tcpsnd	07*TCP Send Ahead
snmp	08+SNMP System Parameters

Table B-103 Menu 4.2.14 pg 1 Keyword Listing (Continued)

Keyword	Description
link	12+Link Setup
ipstat, add	14+IP Static Routes
tlnprt	15 Telnet port number (1..65534)

Table B-104 Menu 4.2.14 pg 2 Keyword Listing

Keyword	Description
10base	01*10 Base T Ethernet
radius	02+Radius Configuration Menu
destbk	03 Destination Menu Break Sequence
tacacs	04+TACACS Configuration Menu
tcpout	05 TCP Outgoing Connection Timer (2-360s)
tidmm	06+TID to Modem Mux Configuration Menu

Table B-105 Menu 4.2.14-2.2 Keyword Listing

Keyword	Description
stat1	01*Primary Server Status (Enabled, Disabled)
ip1	02 Primary Server IP Address
rport1	03 Primary Server Port (1..65535)
secrt1	04 Primary Server Secret
stat2	05*Secondary Server Status (Enabled, Disabled)
ip2	06 Secondary Server IP Address
rport2	07 Secondary Server Port (1..65535)
secrt2	08 Secondary Server Secret
shell	09*Shell/FTP Radius Option (Enabled, Disabled, Local Fallback)

Table B-106 Menu 4.2.14-2.4 Keyword Listing

Keyword	Description
stat1	01*Primary Server Status (Enabled, Disabled)
ip1	02 Primary Server IP Address
tport1	03 Primary Server Port (1..65535)
secrt1	04 Primary Server Secret
stat2	05*Secondary Server Status (Enabled, Disabled)
ip2	06 Secondary Server IP Address
tport2	07 Secondary Server Port (1..65535)
secrt2	08 Secondary Server Secret
shell	09*Shell/FTP TACACS Option (Enabled, Disabled, Local Fallback)

Table B-107 Menu 4.2.14-2.6 Keyword Listing

Keyword	Description
tid	01 TID to route
datbit	02*Port Data Bits (7, 8)
stpbit	03*Port Stop Bits (1, 2)
parity	04*Port Parity (None, Even, Odd)
dial	05 Init String
inact	06 Inactivity Timeout (1 - 3600)

Table B-108 Menu 4.2.14.8 Keyword Listing

Keyword	Description
contac	01 Contact person for this node
name	02 Node name
locat	03 Node location
sndtrp	04*Send authentication traps

Table B-109 Menu 4.2.14.12 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
number	01 Link Number (1-32)
type	02*Link Type (Async, AsyncPPP, ModMux)
descr	03 Link description
state	04*Link state (Enabled, Disabled)
speed	05+Port speed
datbit	06*Port Data Bits (7, 8)
stpbit	07*Port Stop Bits (1, 2)
parity	08*Port Parity (None, Odd, Even)
flwcon	09*Flow Control (None, XonXoff)
xonint	10 Xon Repeat interval (0 - 120s with 0 = no repeat)
con	11+Connect Options
dis	12+Disconnect Options
lead	13+RTS/DTR Lead Control Options
modem	14+Modem Options
autod	16 Auto Disable Error Limit (0-1000000)

Table B-110 Menu 4.2.14.12.5 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
300	01 300 Baud
1200	02 1200 Baud
2400	03 2400 Baud
4800	04 4800 Baud
9600	05 9600 Baud
19200	06 19200 Baud
38400	07 38400 Baud

Table B-110 Menu 4.2.14.12.5 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
57600	08 57600 Baud
115k	09 115200 Baud
auto	10 Auto Baud

Table B-111 Menu 4.2.14.12.11 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
apllic	01*Link Application (Login, Destination, Alias)
alias	02 Alias
retry	03 Call retry interval (0 - 32767 s, 0 = disabled)
dsr	04*Dial/Connect when DSR is on
dcd	05*Connect when DCD is on
chr	06*Connect when characters are received
direct	07*Connect without DSR, DCD or received characters
string	08 Connect string

Table B-112 Menu 4.2.14.12.12 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
dsr	01*Disconnect when DSR is off
dcd	02*Disconnect when DCD is off
break	03*Disconnect when a break character is received
inact	04 Disconnect inactivity timer (0 - 32767s 0 = disabled)
inactr	05*Inactivity Timer enabled when link receives call
disstr	07 Disconnect string

Table B-113 Menu 4.2.14.12.13 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
dtrcon	01*DTR connect state
dtrdis	02*DTR disconnect state (On, Off, Toggle)
rtscon	03*RTS connect state (On, Off, Follows DSR, Flow Control)
rtsdis	04*RTS disconnect state (On, Off, Toggle)

Table B-114 Menu 4.2.14.12.14 (Asynchronous Link Setup) Keyword Listing

Keyword	Description
string	01 Modem string
timout	02 Dialing time-out (5 - 300s)
attemp	03 Number of dial attempts (0 - 100, 0 = continuous retry)

Table B-115 Menu 4.2.14.12 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
number	01 Link Number (1-32)
type	02*Link Type (Async, AsyncPPP, ModMux)
descr	03 Link Description
state	04*Link state (Enabled, Disabled)
speed	05+Port speed
datbit	06*Port Data Bits (7, 8)
stpbit	07*Port Stop Bits (1, 2)
parity	08*Port Parity (None, Odd, Even)
flwcon	09*Flow Control (None, XonXoff)
xonint	10 Xon Repeat interval (0 - 120s with 0 = no repeat)
con	11+Connect Options
dis	12+Disconnect Options
lead	13+RTS/DTR Lead Control Options

Table B-115 Menu 4.2.14.12 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
modem	14+Modem Options
autod	16 Auto Disable Error Limit (0-1000000)

Table B-116 Menu 4.2.14.12.5 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
300	01 300 Baud
1200	02 1200 Baud
2400	03 2400 Baud
4800	04 4800 Baud
9600	05 9600 Baud
19200	06 19200 Baud
38400	07 38400 Baud
57600	08 57600 Baud
115k	09 115200 Baud

Table B-117 Menu 4.2.14.12.11 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
dsr	01 Dial/Connect when DSR is on
dcd	02*Connect when DCD is on

Table B-118 Menu 4.2.14.12.12 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
dsr	01*Disconnect when DSR off
dcd	02*Disconnect when DCD off

Table B-119 Menu 4.2.14.12.13 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
dtrcon	01*DTR connect state
dtrdis	02*DTR disconnect state (On, Off, Toggle)
rtscon	03*RTS connect state (On, Off, Flow Control)
rtsdis	04*RTS disconnect state (On, Off, Toggle)

Table B-120 Menu 4.2.14.12.14 (Asynchronous PPP Link Setup) Keyword Listing

Keyword	Description
string	01 Modem string

Table B-121 Menu 4.2.14.12 (ModMux Link Setup) Keyword Listing

Keyword	Description
number	01 Link Number (1-32)
type	02*Link Type (Async, AsyncPPP, ModMux)
descr	03 Link Description
state	04*Link state (Enabled, Disabled)
speed	05+Port speed
flwcon	06*Flow Control (None, XonXoff)
xonint	07 Xon Repeat interval (0 - 120s with 0 = no repeat)
autod	08 Auto Disable Error Limit (0-1000000)

Table B-122 Menu 4.2.14.12.5 (ModMux Link Setup) Keyword Listing

Keword	Description
300	01 300 Baud
1200	02 1200 Baud
2400	03 2400 Baud
4800	04 4800 Baud

Table B-122 Menu 4.2.14.12.5 (ModMux Link Setup) Keyword Listing (Continued)

Keword	Description
9600	05 9600 Baud
19200	06 19200 Baud
38400	07 38400 Baud
57600	08 57600 Baud
115k	09 115200 Baud

Table B-123 Menu 4.2.14.15.1 Keyword Listing

Keyword	Description
destip	01 Destination IP
nextip	02 Next hop IP

Table B-124 Menu 4.2.20.2 Keyword Listing

Keyword	Description
ipadr	01 IP Address (0.0.0.0 - 255.255.255.254)
iprng	02 IP Address Range (1 - 255)
ipmask	03 IP Subnet Mask (0.0.0.1 - 255.255.255.254)
iprtr1	04 Primary IP Router Address (0.0.0.0 - 255.255.255.254)
iprtr2	05 Secondary IP Router Address (0.0.0.0 - 255.255.255.254)
tcpwin	06*TCP Default Window Size (200, 512, 1024, 2048)
tcpsnd	07*TCP Send Ahead
snmp	08+SNMP System Parameters
nextpg, 10base	09*10BaseT Ethernet Duplex (HALF, FULL)
link	12+Link Setup See Table B-126 for more information on specifying ports with this keyword.

Table B-125 Menu 4.2.20.2.8 Keyword Listing

Keyword	Description
contac	01 Contact person for this node
name	02 Node name
locat	03 Node location
sndtrp	04*Send authentication traps
read	05 Read Community Name
read2	06 MIB2 Read Community Name
write	07 Write Community Name

Table B-126 Menu 4.2.20.2.12 Keyword Listing

Keyword	Description
number	01 Link Number (1-3)
type	02 Link Type (HDLC)
descr	03 Link Description
state	04*Link State (Enabled, Disabled)
clock	05*Clocking (Internal, External)
frame	06*Framing (NoCRC4, CRC4)
lncode	07*Line Code
sltspd	08*Timeslot Speed (56k, 64k)
sltuse	09 E1Timeslot to Use (1-31)

Refer to the Using the str Keyword section for more information on this keyword.

Table B-127 Menu 4.2.20.3.12 Keyword Listing

Keyword	Description
number	01 Link Number (1-3)
type	02 Link Type (HDLC)
descr	03 Link Description

Table B-127 Menu 4.2.20.3.12 Keyword Listing

Keyword	Description
state	04*Link State (Enabled, Disabled)
clock	05*Clocking (Internal, External)
frame	06*Framing (D4, ESF)
lncode	07*Line Code
sltspd	08*Timeslot Speed (56k, 64k)
sltuse	09 T1Timeslot to Use (1-24)
lnbld	10 Line Build Out

Table B-128 Menu 4.18 Keyword Listing

Keyword	Description
str	01 through 14

Table B-129 Menu 5 Keyword Listing

Keyword	Description
lport	01 The lowest port number to be affected by this restriction
hport	02 The highest port number to be affected by this restriction
class	03 Restrict the ports from accessing this destination
delete	19 Delete this restriction

Table B-130 Menu 7 Keyword Listing

Keyword	Description
dbox0	01 Slot density (number of TDSNs per slot) for CPU box
dbox1	02 Slot density for first expander box
dbox2	03 Slot density for second expander box
dbox3	04 Slot density for third expander box
dbox4	05 Slot density for fourth expander box

Table B-130 Menu 7 Keyword Listing (Continued)

Keyword	Description
dbox5	06 Slot density for fifth expander box
dbox6	07 Slot density for sixth expander box
dbox7	08 Slot density for seventh expander box

Table B-131 Menu 8 Keyword Listing

Keyword	Description
name	01 Alias name
type	02+Simple alias translation
class	03 Destination
calstr	04 Called address
visabl	05 This alias is visible in the destination menu
link	06 Link number is (1..16)
callng	07 Caller's address
cud	08 Call data
applic	09 App. string
proto1	10 Called protocol
proto2	11 Caller's protocol
altrt	12 Alternate routing alias
delete	19 Delete the above alias translation entry

Table B-132 Menu 8.2 Keyword Listing

Keyword	Description
simple	01 Simple alias translation
muxcon	02 Multiplexed connection
muxonl	03 Multiplexed only translation
slcrot	04 SLC routing translation

Table B-133 Menu 10.1 Keyword Listing

Keyword	Description
cltmac	01 Client MAC Address (xx:xx:xx:xx:xx:xx)
cltip	02 Client IP Address
svrip	03 TFTP IP Address
rtrip	04 Router IP Address
submask	05 Subnet Mask
srname	06 Server Name
cfname	07 TFTP File Name

config Commands Not Associated with Menus

This section includes **config** commands that are not associated with a specific menu. The descriptions that follow include a definition of the **config** command, the syntax to follow when entering the command, definitions of any variable arguments contained in the command, and an example of how to use the **config** command.

config accountp/c

This command creates a new profile. If the profile name already exists, the system prints a warning message, and this command, with all subsequent commands on that profile have no affect. If this command is successful, the system considers the profile to be open and you must issue a **config accountp/s** command before this command is executed on a new profile.

Format

config accountp/c *profile name*

Parameter

profile name	Is the name of the profile you want to create. The profile name can be any sequence of printable ASCII characters except for a space.

Example:

```
config accountp/c fred
```

config accountp/e

This command edits an open profile.

Note: You must issue a **config accountp/s** command to save any profile edits.

Format

config accountp/e *command*[,*command*[,*command*[,*command*[,*command*]]]]

Parameter

command	Specifies a command for the associated profile. Refer to Chapter 3: Introduction to System Configuration for a list of valid commands.

Example:

```
config accountp/e stat,states,status,tftpstat,tmract
```

config accountp/s

This command saves and closes the opened profile.

Format

config accountp/s

config account/a

This command enters a new user's account, password, and to associate a profile. If the user account already exists, or the profile you specify does not exist, the system prints an error message and none of your changes will occur in the CLC.

Format

config account/a *username encoded user password userprofile name*

Parameters

username	Specifies the user name for a specific account.
encoded user password	Specifies the user's password that is encoded for security purposes.
userprofile name	Defines the profile the user can access.

Example:

config account/a joe 0C5aeec3 status$0989

config clcinfo

This command enters the CLC IP address, the router IP address, the subnet mask, the telnet port, and the FTP port. Commands after this command may be in any order and on one line.

Format

config clcinfo,clcip=*CLC IP address*,**clcrtr=***router IP address*,**clcmask=***subnet mask*

config clcinfo,telnetport=*telnet port number*,**ftpport=***FTP port number*

Parameters

CLC IP address	Is the CLC IP address. Enter a string of 4 period delineated values with ranges of 0-255.
router IP address	Is the router IP address. Enter a string of 4 period delineated values with ranges of 0-255.
subnet mask	Is the subnet mask. Enter a string of 4 period delineated values with ranges of 0-255.
telnet port number	Is the port number used by telnet. The valid range is 0-65535.
FTP port number	Is the port number used by FTP. The valid range is 0-65535.

Example:

```
config clcinfo,clcip=172.16.1.100,
clcrtr=172.16.0.1,clcmsk=255.255.0.0
config clcinfo,telnetport=23,ftpport=21
```

config commnames

This command enters the read and write community strings.

Note: The strings in quotation marks are case-sensitive. Do not define identical strings for both the read and write community strings.

Format

config commnames=*card*,**readcom="***read community name string*",**writecom="write community name string"**

Parameters

card	Specifies the card to which you want to assign the community names. Valid values are CLC or a baseport number.
read community name string	Is the read community name for the CLC or for the card at the specified baseport. It should be different than the write community string.
write community name string	Is the write community name for the CLC or for the card at the specified baseport. It should be different than the read community string.

Example:

```
config commnames=clc,read comm="public",writecomm="Administrator"
```

config mibII

This command configures parameters defined by SNMP MIBII, including:

- cold start delay
- trap timer
- asynchronous trap state
- name string
- contact string
- location string

Note: The strings in quotation marks are case-sensitive.

Format

config mibII,startdelay=*start delay*,**traptimer=** *trap timer*,**asynctrap=***asynchronous trap*

config mibII,name="*name string*",**contact="***contact string*",**location="***location string*"

Parameters

start delay	Defines the time delay before starting after a cold boot.
trap timer	Specifies the timer for a trap.
asynchronous trap	Specifies a value of on or off indicating the state of asynchronous traps.
name string	Specifies a string identifying the name of the SNMP node (AI198).
contact string	Specifies a string identifying the SNMP system contact.
location string	Specifies a string identifying the node location.

Example:

```
config mib,startdelay=0,traptimer=300,asynctrap=off
config mibII,name="dallas gateway",contact="jill xirb",location="New Orleans"
```

config trap

This command enters the IP address to the SNMP table.

Note: You can type more than one IP address per line. However, it is recommended that you type only four IP addresses per line.

Format

config trap=*IP address*[[,*IP address*]...]

Parameter

IP address	Is the IP address of an SNMP manager.

Example:

```
config trap=198.17.11.3,198.17.11.4,172.85.96.29
```

Reading Alias Macros

A macro is a program within an alias that translates incoming call requests into outgoing call requests. It is a shortcut that allows a programmer to write many aliases by writing one alias macro.

This appendix is intended to serve as a guide for translating a macro, so that you understand what it is trying to accomplish. Translating macros can sometimes help you troubleshoot problems.

Note: This document does not cover writing macros.

Guide to this Appendix

Overview

Macros are an important part of alias translations. For more information about aliases, refer to Chapter 3: Introduction to System Configuration. Macros allow you to create fewer aliases when you configure a system. When you use them with alternate routing, you have multiple routes available for a single alias.

A macro may be entered for any or all combinations of alias names, called addresses, caller's addresses, call data, application-specific strings, and alternate routing aliases. Each macro acts as a command line with instructions for matching patterns in alias fields and manipulating them for redirection.

Macro Facts

- Similar to the programming language BASIC.
- Performs numeric and string functions.
- Characterized with an equal sign (=) in the first position of the field, which is followed by commands necessary to manipulate the field.
- Each macro command is limited to 200 characters. (For brevity, most of the functions can be condensed to a single letter. At least one character must be entered after the equal sign =.)

The Backslash Character

Any macro string can include the backslash character (\). This character is used to "escape" another character (that is, to remove another character's normal meaning). You may use the backslash character in any macro string (except the link number) to perform the following functions:

String	Interpreted as...
\b	Beep the system speaker
\r	Carriage return
\\	Prints the backslash character with no special meaning

Parts of a Macro

To effectively read a macro, it is helpful to understand the parts of a macro. They are listed as:

- Start
- Comments
- Constants
- Variables
- MS DOS wildcard symbols
- Operators
- Functions

Start

Macros start with an equal (=) sign. They are followed by one or more commands. Commands may have only one character. One macro may contain up to 200 characters.

Comments

A programmer has two options for adding comments to macros. He may make a comment on a blank line or he may make a comment within a line. A comment on a blank a line begins with two forward slashes (//). A comment within a line begins after the macro commands with a pound sign (#).

Examples

```
09 App. string ----------------------//Links 2-16
07 Caller's Address ---------='6145553728#from OH
```

The pound sign (#) is acceptable in a macro if it is enclosed in either single or double quotes. The pound sign may be either directly enclosed (198.127.1.4'#'23) or the string that the pound sign is in may be enclosed ('198.127.1.4#23').

Constants

Macro constants are either fixed alphanumeric characters that are enclosed in single or double quotes, or integers that are whole numbers between positive and negative 2,147,483,648. All strings equal zero. Strings cannot be used in mathematical functions.

Table C-1 Macro Constants

Macro Constant	Value
2+5-1	6
'2+5-1'	string: '2+5-1'; equals 0

Variables

Macros recognize several variables; note the following table. An inbound call requires, in order of precedence, at least one of the following: CUD or LCN, Called address, Caller/calling address. An outbound call requires a destination. It might also include at least one of the following: CUD or LCN, called address, or caller/calling address; MUX; Alternate routing string (Alias line 12).

Note: The macros Z, X, and Y should be used to receive data from a network element to provide case-sensitive user call data.

Table C-2 Macro Variables

Variables	Type	Value
C and Z CUD	X.25 SVC	Call user data (CUD)
	X.25 PVC	LCN
	TCP/IP	Called address (for backwards compatibility)
A and X CALLED	X.25 SVC value	Called address
	X.25 PVC value	Not populated
	TCP/IP value	Called address
B and Y CALLER	X.25 SVC value	Caller address (calling address)
	X.25 PVC value	Not populated
	TCP/IP value	Caller address (calling address)

Table C-2 Macro Variables (Continued)

Variables	Type	Value
PORT	Asynchronous	TDS number of port originating call
	Smart Line Card	Baseport number

MS DOS wildcard symbols

Within an alias name, macros use two MS-DOS wildcard symbols:

? This symbol matches any one character.

* This symbol matches zero or more characters.

Operators

The CLC reads and evaluates mathematical expressions in alias macros. These expressions are represented by operators. The CLC reads them from left to right in order of precedence as shown in the table. To change the order of precedence, a programmer may enclose a section in parentheses ( ). Just as in mathematics, the portion within parentheses is calculated first.

Example

4+3*2 This equation equals 10.

(4+3)*2 This equation equals 14.

Boolean Logic

The last three operators that are evaluated by the CLC are Boolean logic functions: logical AND, logical exclusive OR, and logical OR. Boolean logic in alias macros also includes IF statements, which specify that if a condition is true, do something, and if it is not, then do something else.

- Logical AND

  This function requires that two conditions are true before continuing. For example, you must have peanut butter AND jelly to make a peanut butter jelly sandwich. Logical AND is denoted by an ampersand (&).

- Logical exclusive OR (XOR)

  This function requires that one condition or another must be true (but not both) before continuing. For example, you are either standing up OR sitting down, not both. Logical exclusive OR is denoted by a caret (^).

- Logical OR

  This function requires that one condition or another (or both) be true before continuing. For example, you can stand up OR chew gum OR both stand up and chew gum. Logical OR is denoted by a straight line (|).

Table C-3 Operators in Order of Precedence (First to Last)

Operator	**Function**
#	Remark, ends the macro evaluation
!	Not
* / %	Multiply Divide Remainder
+ -	Add Subtract
<< <<= = > >= <<>	**Note:** Returns 0 for false, -1 for true Less than Less than or equal to Equal Greater than Greater than or equal to Not equal

Table C-3 Operators in Order of Precedence (First to Last) (Continued)

Operator	Function
&	Boolean logical AND (both necessary to be true)
^	Boolean logical exclusive OR (one or the other acceptable to be true, not both)
|	Boolean logical OR (either acceptable to be true)

Functions

Functions are preset, and they convert strings and numbers. Several macro functions have two names for the same function: the word and a one letter initial. For example, **s** and **switch** represent the same macro function. The following table lists the functions and their descriptions in alphabetical order.

Table C-4 Alias Macro Functions

Alias Macro Function	Description of Operation
asc$(*string***)**	Returns the integer value of the first character in the string.
chr$(*n***)**	Returns a string holding the character whose ASCII value is *n*.
hex$(*n***)** or **h(***n***)**	Returns *n* converted into a hexadecimal integer value. Example: **=hex$(13)** returns the hexadecimal integer value D
if(*expression,a,b***)** or **i(***expression,a,b***)**	Returns item *a* if expression is not zero or *b* if expression is zero.
left$(*string,n***)** or **l(***string,n***)**	Returns left most *n* characters of the string. (Returns the entire string if *n* is greater than the length of the string.)
len(*string***)** or **n(***string***)**	Returns the length of the string. Example: **=n(bob)** returns the integer 3
mid$(*string,x,n***)** or **m(***string,x,n***)**	Returns *n* characters from the string starting with the *x*th character. (Returns a null string if *x* is greater than the length of the string. Returns to end of the string if fewer than *n* characters follow character *x*.)

Table C-4 Alias Macro Functions (Continued)

Alias Macro Function	Description of Operation
mid$(*string,x***)** or **m(***string,x***)**	Returns characters from the string starting with the *x*th and ending at the right end. (Returns a null string if *x* is greater than the length of the string.)
pos(*string,char,n***)** or **p(***string,char,n***)**	Returns position of the *n*th occurrence of *char* in the string. (Returns the length of the string if there are less than *n* occurrences of *char*.)
right$(*string,n***)** or **r(***string,n***)**	Returns the rightmost *n* characters of the string. (Returns the entire string if *n* is greater than the length of the string.)
str$(*n***)** or **d(***n***)**	Returns *n* converted into a decimal string.
switch(*target_exp, default,exp1,result1, exp2,result2...***)** or **s(***target_exp,default, exp1,result1,exp2, result2...***)**	If *target_exp* matches *exp1*, returns *result1*. If *target_exp* matches *exp2*, returns *result2*. This continues through all pairs of expressions and results. If *target_exp* does not match any of the expressions, then *default* is returned.
val(*string***)** or **v(***string***)**	Converts a string to its decimal integer value. Example: **=v(032)** returns the integer 32
?(*n***)**	Returns the *n*th wild card string from the alias match.

Macro Examples

Note: Often there are several ways to write a macro and get the same result. One programmer will likely design macros differently from another programmer.

Example 1

```
                                                                    Menu 8
01 Alias name ------------------------------------------------------405235*
02+Multiplexed only translation
03 Destination ----------------------------------------------='BP'+M(A,8,3)
04 Called address ---------------------------------------------------PVC
05 This alias is visible in the destination menu--------------------------YES
06 Link number is (1..16) -
07 Caller's address -
08 Call data ------------------------------------------------------=R(A,9)
09 App. string -------------------------------//NMA CALLS TO ALL NES AT REMOTE
10 Called protocol -------------------------------------------------------E
11 Caller's protocol -----------------------------------------------------E
12 Alternate routing alias -


14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

Description

01	Alias name must start with 405235 followed by zero or more characters.
03	Destination starts with BP plus the 8th, 9th, and 10th characters from the called address.
08	Call data comes from the last 9 characters from the called address.
09	Comment line; these are NMA calls to network elements at the remote site.

Example 2

```
                                                                    Menu 8
01 Alias name ------------------------------------------------------ALTSAC*
02+Simple alias translation
03 Destination ----------------------------------------------------------BP048
04 Called address ------------------------------='200.200.210.30#2'+(R(C,2))
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1.16) -
07 Caller's address -
08 Call data -
09 App. string --------------------------TO SACRAMENTO AI196 SLOT 6 LINKS 1-16
10 Called protocol ------------------------------------------------------E
11 Caller's protocol ----------------------------------------------------E
12 Alternate routing alias -


14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

Description

01 Alias name starts with ALTSAC followed by zero or more characters.

04 Called address starts with 200.200.210.30#2 plus the last two characters from Call data.

Example 3

```
                                                                        Menu 8
01 Alias name --------------------=L(A,7)='89.5.6.'&V(M(A,8))>49&V(M(A,8))<<101
02+Multiplexed only translation
03 Destination ------------------------------------------------------------BP064
04 Called address ---------------------------------------------------------=A
05 This alias is visible in the destination menu----------------------------NO
06 Link number is (1..16) -------------------------------------------------2
07 Caller's address -------------------------------------------------------=B
08 Call data --------------------------------------------------------------=C
09 App. string -
10 Called protocol ------------------------------------------------E T B F
11 Caller's protocol ----------------------------------------------E T B F
12 Alternate routing alias -


14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

Description

01 Alias name matches Ethernet addresses between 89.5.6.50 and 89.5.6.100.

Example 4

```
                                                                        Menu 8
01 Alias name ---------------------=L(C,5)='00161'&V(R(C,3))>=17&V(R(C,3))<<=32
02+Multiplexed only translation
03 Destination ------------------------------------------------------------BP032
04 Called address -------------------------='200.200.210.30#'+D(V(R(C,2))+284)
05 This alias is visible in the destination menu---------------------------YES
06 Link number is (1..16) -------------------------------------------------2
07 Caller's address -
08 Call data -
09 App. string ---------------------------TO SACRAMENTO AI196 SLOT 6 LINKS 1-16
10 Called protocol --------------------------------------------------------E
11 Caller's protocol ------------------------------------------------------E
12 Alternate routing alias ----------------------------------='ALTSAC2'+R(C,2)



14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

Description

01 Alias name associates PVC LCN 17 through 32.

04 Destination matches 200.200.210.30#301 through 200.200.210.30#316, respectively.

Example 5

```
                                                                    Menu 8
01 Alias name -----------------=L(A,6)='405236'&M(A,9,5)='03365'&M(A,15,2)='06'
02+Multiplexed only translation
03 Destination ------------------------------------------------------------BP032
04 Called address ---------------------------------------------------------PVC
05 This alias is visible in the destination menu---------------------------NO
06 Link number is (1..16) -
07 Caller's address -
08 Call data -----------='0032'+S(R(A,1),'00','1','01','2','02','3','03')+'002'
09 App. string ----------------------------------------//REMOTE FLEXAR ACCESS
10 Called protocol --------------------------------------------------------E
11 Caller's protocol ------------------------------------------------------E
12 Alternate routing alias -



14+Test macros
15 Show entire alias
16 Show the first entry in the alias translation table
17 Show the previous entry in the alias translation table
18 Show the next entry in the alias translation table
19+Delete the above alias translation entry
20 Save the changes made (20b: to the beginning, 20e: to the end)
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

Description

01 Alias name first 6 characters from `Called address` must match '405236'; the 9th through 13th characters from `Called address` must match '03365'; the 15th and 16th characters from `Called address` must match '06'; the rest of the characters from the `Called address` may vary.

08 Call data for an AI196 PVC ID base port is always 0032; PVC ID link number from called address will be the string: 1, 2, or 3; PVC ID LCN number is always 002.

Menu 4.2: Configure as...

This menu is used to set the type of interface card installed in the slot specified by menu item 4.1. Any selection made here will appear in the text of menu item 4.2.

```
>2
                                                                    Menu 4.2
01 Configure as Empty Slot
02+Configure as AI183/AI185 standard 4/16 port card
03+Configure as AI193/194 Ethernet card with slot expansion of-----1
04+Configure as AI192/196 X.25 network card with slot expansion of--------
05+Configure as ASP or Advanced Smart Line Card with slot expansion of--------
06 Configure as AI196-I network card with LocalView
07 Configure as AI2524 Router card
08 Configure as AI294 Ethernet Switch card
09+Configure as AI196-I network interface card with menu support
10 Configure as Independent Smart Line Card
11+Configure as AI296 network interface card
12+Configure as AI192/196 with full menu support and slot expansion of--------
13+Configure as AI285 network interface card
14+Configure as AI232 network interface card
15 Configure as AI Modem
16 Configure as AIFlex Fiber LAN Extender Card
17 Configure as AI120 Card
18 Configure as AIE1 Card
19 Configure as AITC Card
20 Next Page
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key>
```

This appendix includes menu descriptions for the Smart Line Cards and Asynchronous Cards listed.

Guide to this Appendix

[Menu 4.2.2: Configure as AI183/185 standard 4/16 port card]

[Menu 4.2.3: Configure as AI193/194 Ethernet card with slot expansion of]

[Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of]

[Menu 4.2.5: Configure as ASP or Advanced Smart Line Card with slot expansion of]

[Menu 4.2.12: Configure as AI192/196 with full menu support]

For configuration information on all other Smart Line Cards, refer to that card's specific user's manual.

Menu 4.2.2: Configure as AI183/185 standard 4/16 port card

Menu 4.2.2 allows you to configure each port independently.

```
>2
                                                                  Menu 4.2.2
01 Port number (0-15) for card at baseport 000------------------------------00
02+Call can be placed from this port
03*Automatic baud rate detection for this port is--------------------------OFF
04+If autobaud is OFF this port operates at 9600 baud
05+Port set for 8 bits per character (normal setting)
06+Port set for 1 stop bit
07+Port set for NO parity
08*Automatic echo of characters when the switch talks to this port----------ON
09*Destination menu displayed on this port----------------------------------ON
10*Port able to place call(s) on hold---------------------------------------OFF
11+Disconnect via break is enabled
12+Disconnect via EIA signal or pass EIA signal is disabled
13+Set the state of EIA pins for idle and connect
14 The port description/address is----------------
15*Port is included when * is used with DISABL or ENABL---------------------ON
.
.
20 Retain these changes for saving in Menu 4
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2

Menu 4.2.2: 01 Port number (0-15) for card at baseport

In order to select a menu item or submenu, you must first specify which port you want to configure by entering its port number in menu item 4.2.2.1. Valid port numbers are 0 to 15, inclusive.

Copying Information to other Ports

You can save time by copying the parameters for one port to other ports on the same card. To copy the parameters of a single port to other ports, enter the following:

`1 copy` *n*-*m*

n A single port number or the lowest port number in a range of ports from *n* to *m*.

m The highest port number in a range of ports from *n* to *m*.

This copies the settings from the displayed port to all specified ports.

For example, **`1 copy 3-5`** copies the current port information to ports 3, 4, and 5.

Individual ports can be included by using commas as separators. For example, **`1 copy 3,7-9,13`** copies the current port information to ports 3, 7, 8, 9, and 13.

Menu 4.2.2: 02+Call can be placed from this port

Menu item 4.2.2.2 is valid only for interface cards. It is the most common connection setting for a terminal. This setting allows you to select a destination with the keyboard, to automatically connect to a predefined destination, or to define the port as a destination itself. See Menu 4.2.2.2: Port Destination Name on page D-6 for more information.

Menu 4.2.2: 03*Automatic baud rate detection for this port is

This menu item is a toggle that specifies if automatic baud rate detection ("autobaud") is enabled for the specified port. If autobaud is on, then the port will automatically determine the proper baud rate.

Menu 4.2.2: 04+If autobaud is OFF this port operates at 9600 baud

If you have disabled autobaud by setting menu item 4.2.2.3 to OFF, then you must enter this menu to set the baud rate for the port. Note that if you set autobaud to ON, any setting that you make from this menu will have no effect. See Menu 4.2.2.4: If autobaud is OFF this port operates at on page D-7 for more information.

Menu 4.2.2: 05+Port set for 8 bits per character (normal setting)

This menu is used to specify the number of bits per character. Selecting this item takes you to menu 4.2.2.5, where you can specify the number of data bits from a submenu. Valid settings are 5 through 8; the default is 8. See Menu 4.2.2.5: Port Bits per Character on page D-8 for more information.

Menu 4.2.2: 06+Port set for 1 stop bit

This menu is used to specify the number of stop bits per character. Selecting this item takes you to menu 4.2.2.6, where you can specify the number of stop bits from a submenu. Valid settings are 1, 1.5, and 2; the default is 1. See Menu 4.2.2.6 Port Stop Bits on page D-8 for more information.

Menu 4.2.2: 07+Port set for NO parity

This menu is used to specify the type of parity used on this port. Selecting this item takes you to menu 4.2.2.7, where you can specify the type of parity from a submenu. Valid settings are EVEN, ODD, and NO; the default is NO. See Menu 4.2.2.7: Port Parity on page D-9 for more information.

Menu 4.2.2: 08*Automatic echo of characters when the switch talks to this port

Selecting this menu item toggles the value on or off. The default is ON.

If this menu item is set to ON, characters that are entered via the keyboard will be echoed by the AI180. This is used with terminals that operate in full duplex. Set this menu item to OFF for terminals that operate in half duplex.

Menu 4.2.2: 09*Destination menu displayed on this port

Selecting this menu item toggles the value on or off. The default is ON. This menu item determines if a menu listing the destinations available to you should be displayed on this port.

Even if the destination menu is enabled on a system-wide basis (see menu item 1.5), display of this menu can be prevented on specific ports by setting this menu item to OFF. The OFF setting can be used for dial-in ports where security is very important.

If both this menu item and menu item 1.5 are set to ON, the destination menu will appear as normal on this port. Menu 4.2.2.9 does not override an OFF setting in menu 1.5.

Menu 4.2.2: 10*Port able to place call(s) on hold

Selecting this menu item toggles the value on or off. The default is OFF.

This menu item determines if this port may use the port hold feature. If set to OFF, the call is terminated when the user disconnects. When set to ON, the system asks if you wish to disconnect or place the call on hold. You can decide to place many calls on hold if this menu item is set to ON.

Menu 4.2.2: 11+Disconnect via break is enabled

This menu lets you specify the method that a port can use to signal that it wants to disconnect. The default is `Disconnect via break is enabled`.

Selecting one of the listed menu items returns you to Menu 4.2.2 where the setting is displayed in menu item 4.2.2.11. This keeps your changes until you save them (see menu item 4.2.2.20) or discard them (see menu item 4.2.2.21).

See Menu 4.2.2.11: Disconnect via Break on page D-9 for more information.

Menu 4.2.2: 12+Disconnect via EIA signal or pass EIA signal is disabled

Ports can signal for a disconnect using a Dataset Ready signal (DSR) or use it as a control signal to the connected party. This menu item lets you determine when a disconnection signal will be sent.

To use this feature, all cables must have pins 4, 6, and 20 connected.

Selecting one of the listed menu items returns you to Menu 4.2.2 where the setting is displayed in menu item 4.12. This keeps your changes until you save them (see menu item 4.2.2.20) or discard them (see menu item 4.2.2.21).

The current setting is displayed in menu item 4.2.2.12. The default is `Disconnect via EIA signal or pass EIA signal is disabled`. See Menu 4.2.2.12: EIA Disconnect for more information.

Menu 4.2.2: 13+Set the state of EIA pins for idle and connect

Menu 4.2.2.13 lets you set the state of outgoing EIA leads when the port is online and offline. When a port is idle, it is connected but not actively online. There are ways to set DSR and Data Terminal Ready (DTR) at both idle and connect time. See Menu 4.2.2.13: EIA Pin State for Idle and Connect on page D-12 for more information.

Menu 4.2.2: 14 The port description/address is

You can enter a description of this port in this menu item. Any alphanumeric string up to 29 characters can be used to enter a user's name, a host port designation, or a cable designation that can aid in designing your configuration.

You can also use this menu item to specify additional routing information for a port with auto connect settings. If this string begins with an equal sign (=), the remainder of the string in menu item 4.2.2.14 is treated as though it had been entered at the destination menu prompt. This allows alternate routing.

Menu 4.2.2: 15*Port is included when * is used with DISABL or ENABL

The **stpslc**, **disabl**, and **enabl** commands perform their operation on the entire card, an individual port on the card, or a range of ports. Each of these commands now has a ***** argument that instructs the command to perform its operation on ports based on this menu setting. Selecting this item and pressing ENTER toggles whether or not this card is affected:

- If menu item 4.2.2.15 set to ON, then this port will be affected by a **stpslc ***, **disabl ***, or **enabl *** command (that is, it will be stopped, disabled, or enabled).
- If menu item 4.2.2.15 set to OFF, then this port will not be affected by a **stpslc ***, **disabl ***, or **enabl *** command (that is, these commands will have no affect on this port).

Menu 4.2.2: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the menu items on Menu 4.2.2. This returns you to Menu 4 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.2: 21 Exit this menu with no changes

Select this menu item to return to Menu 4. Any changes made on Menu 4.2.2 will not be retained unless you exit using menu item 4.2.2.20.

By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.2.2: Port Destination Name

```
>2
                                                                  Menu 4.2.2.2
01 Call can be placed from this port
02 Port is a destination with name-----------------------------------********
03 Port auto-calls to destination when a <CR> is received-------------********
04 This port automatically connects to port number--------------------------***
.
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.2: 01 Call can be placed from this port

This menu item is valid only for interface cards. It is the most common connection setting for a terminal. This setting allows you to select a destination with the keyboard. To connect, type the name of the desired destination.

Menu 4.2.2.2: 02 Port is a destination with name

Menu item 4.2.2.2.2 is used to specify a destination name for the specified port. Enter a valid destination name for this menu item to direct all call requests for that destination to this port. You must first use Menu 2 to create the destination name before you can assign it to a card in Menu 4.2.2.2.

This item requires a destination name. Enter the following:

2,*destination*

destination is a previously defined destination name.

Menu 4.2.2.2: 03 Port auto-calls to destination when a <CR> is received

This setting lets you specify a user port that will automatically be connected to the destination when you press ENTER.

This item requires a destination name. Enter the following:

3,*destination*

destination is a previously defined destination name to which this port is to be connected.

In this case, you do not need to know that the AI180 exists. You cannot select any destination other than the one specified here.

Menu 4.2.2.2: 04 This port automatically connects to port number

This setting, known as autoconnect, is used if a port is directly connected to a destination.

This menu item requires a port number. Enter the following:

4,*port*

port is a valid port number to which the port will be dedicated.

In this case, the port is always connected to this destination. You do not have to perform any connect or disconnect procedures.

Menu 4.2.2.2: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.2 without changing the selection.

Menu 4.2.2.4: If autobaud is OFF this port operates at

```
                                                                Menu 4.2.2.4
01 If autobaud is OFF this port operates at 50 baud
02 If autobaud is OFF this port operates at 75 baud
03 If autobaud is OFF this port operates at 110 baud
04 If autobaud is OFF this port operates at 134.5 baud
05 If autobaud is OFF this port operates at 150 baud
06 If autobaud is OFF this port operates at 300 baud
07 If autobaud is OFF this port operates at 600 baud
08 If autobaud is OFF this port operates at 1200 baud
09 If autobaud is OFF this port operates at 1800 baud
10 If autobaud is OFF this port operates at 2000 baud
11 If autobaud is OFF this port operates at 2400 baud
12 If autobaud is OFF this port operates at 3600 baud
13 If autobaud is OFF this port operates at 4800 baud
14 If autobaud is OFF this port operates at 7200 baud
15 If autobaud is OFF this port operates at 9600 baud
16 If autobaud is OFF this port operates at 19200 baud
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.4: 01 through 16 Port baud rate if autobaud if OFF

If autobaud is set to OFF for the selected port (menu 4.2.2, item 03), use Menu 4.2.2.4, items 01 through 16, to specify the baud rate of the port. Note that these settings only take effect if autobaud is disabled; if autobaud is ON, selecting any of these menu items will have no effect.

Selecting one of the menu items shown sets that baud rate for the port and returns you to Menu 4.2.2 where the selected baud rate is then displayed. This keeps your changes until you save them (see menu item 4.2.2.20) or discard them (see menu item 4.2.2.21). The default is 9600.

Menu 4.2.2.4: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.2 without changing the selection.

Menu 4.2.2.5: Port Bits per Character

```
                                                                Menu 4.2.2.5
01 Port set for 5 bits per character
02 Port set for 6 bits per character
03 Port set for 7 bits per character
04 Port set for 8 bits per character (normal setting)
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.5: 01 through 04 Bits per Character

These menu items are used to determine the number of bits per character.

Selecting one of these menu items sets that value and returns you to Menu 4.2.2 where the selected value is then displayed. This menu keeps your changes until you save them (menu item 4.2.2.20) or discard them (menu item 4.2.2.21).

The number must be 7 or 8 bits if you wish to communicate with the AI180 itself. The argument for other ports can be 5, 6, 7, or 8 bits per character. If parity is not being used, 8 bits is used as the default setting.

Menu 4.2.2.5: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.2 without changing the selection.

Menu 4.2.2.6 Port Stop Bits

```
                                                                Menu 4.2.2.6
01 Port set for 1 stop bit
02 Port set for 1.5 stop bits
03 Port set for 2 stop bits
.
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.6: 01 through 03 Stop Bits

These menu items are used to determine the number of stop bits following the character.

Selecting one of these menu items sets that value and returns you to Menu 4.2.2 where the selected value is then displayed. This keeps your changes until you save them (menu item 4.2.2.20) or discard them (menu item 4.2.2.21).

This menu item is usually set for 1 stop bit. However, you can also set this port for 1.5 or 2 stop bits.

Menu 4.2.2.6: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.2 without changing the selection.

Menu 4.2.2.7: Port Parity

```
                                                                Menu 4.2.2.7
01 Port set for EVEN parity
02 Port set for ODD parity
03 Port set for NO parity
.
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.7: 01 through 03 Parity

These menu items are used to select the parity type for this port.

Selecting one of these menu items sets that value and returns you to Menu 4.2.2 where the selected value is then displayed. This keeps your changes until you save them (menu item 4.2.2.20) or discard them (menu item 4.2.2.21).

No parity is the default setting.

Menu 4.2.2.7: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.2 without changing the selection.

Menu 4.2.2.11: Disconnect via Break

```
                                                               Menu 4.2.2.11
01 Disconnect via break or long break is disabled
02 Disconnect via break is enabled
03 Disconnect via long break is enabled
.
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.11: 01 Disconnect via break or long break is disabled

When you select this menu item, the system ignores the disconnect arguments that are specified for this port and only monitors the host port disconnect settings. If this menu item is selected and break is disabled, the disconnect items of Menu 4.2.2.12 are still valid.

Menu 4.2.2.11: 02 Disconnect via break is enabled

When this setting is used, the BREAK key is used to signal disconnect from the AI180.

The BREAK key is also often used on host ports because a break is generated when a host loses power. Therefore, a break will disconnect users whenever a host fails. When the AI180 senses a break, the break is transmitted to the destination port.

If you wish to transmit a break to the host when a disconnection occurs, you may use menu item 2.15.4 to transmit that break sequence.

Menu 4.2.2.11: 03 Disconnect via long break is enabled

Select this menu item to require a long break sequence in order to disconnect from this port.

To send a long break sequence, you must press the BREAK key three times in quick succession. If the BREAK key is only pressed once, then the break is ignored by the AI180 and is sent on to the connected port.

This feature should be used for hosts that use the BREAK key for some other function. This menu item should not be used with any destination that uses the maximum session timer (menu item 2.10 and menu item 2.11).

If you decide to use this long break disconnect, and you have trouble generating the long break from your terminal, you may have to adjust the long break timer to suit your terminal (see menu item 1.3).

Menu 4.2.2.11: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.2 without changing the selection.

Menu 4.2.2.12: EIA Disconnect

```
                                                                Menu 4.2.2.12
01 Disconnect via EIA signal or pass EIA signal is disabled
02 Pass DSR to RTS is enabled
03 Disconnect immediately when DSR goes OFF
04 Disconnect only when DSR goes from ON to OFF is enabled
05 Disconnect immediately when DCD goes OFF
06 Disconnect only when DCD goes from ON to OFF is enabled
.
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.12: 01 Disconnect via EIA signal or pass EIA signal is disabled

Select this menu item if you do not wish to pass or use the DSR signal. This is the default.

Menu 4.2.2.12: 02 Pass DSR to RTS is enabled

Specify this menu item if you wish to pass dataset signals from any port connected to this destination. If this menu item is specified for both ports in a connection, the status of the DSR circuit is passed to the Request To Send (RTS) circuit of the associated port.

Menu 4.2.2.12: 03 Disconnect immediately when DSR goes off

This menu item specifies that if the DSR signal is lost for any reason, then the switch initiates a disconnect.

Menu 4.2.2.12: 04 Disconnect only when DSR goes from ON to OFF is enabled

To use this method, you must first set the DSR signal to ON before the AI180 will allow the loss of this signal to initiate a disconnect.

This disconnect method is useful for auto-dial modems that do not set their DSR signal.

Menu 4.2.2.12: 05 Disconnect immediately when DCD goes off

This menu item specifies that if the DCD signal is lost for any reason, then the switch initiates a disconnect. The AI185 must be Revision 4 or later, and the distribution panel must be DP185B-DCD, in order to support this feature.

Menu 4.2.2.12: 06 Disconnect only when DCD goes from ON to OFF is enabled

To use this method, you must first set the DCD signal to ON before the AI180 will allow the loss of this signal to initiate a disconnect. The AI185 must be Revision 4 or later, and the distribution panel must be DP185B-DCD, in order to support this feature.

This disconnect method is useful for auto-dial modems that do not set their DSR signal.

Menu 4.2.2.12: 21 Exit this menu with no changes

This menu returns you to Menu 4.2.2 without changing the setting.

Menu 4.2.2.13: EIA Pin State for Idle and Connect

```
                                                                Menu 4.2.2.13
01*The state of the EIA lead RTS when disconnected is-----------------------ON
02*The state of the EIA lead DTR when disconnected is-----------------------ON
03*The state of the EIA lead RTS when connected is--------------------------ON
04*The state of the EIA lead DTR when connected is--------------------------ON
05*When disconnecting toggle the EIA lead RTS is----------------------------OFF
06*When disconnecting toggle the EIA lead DTR is----------------------------OFF
.
.
20 Retain these changes for saving in Menu 4.2.2
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.2.13: 01*The state of the EIA lead RTS when disconnected is

Selecting it toggles the value on or off. The default is set to ON. Setting this menu item to ON sets the RTS lead to ON when the port is not actively online.

Menu 4.2.2.13: 02*The state of the EIA lead DTR when disconnected is

Selecting this menu item toggles the value on or off. The default is ON.

Setting this menu item to ON sets the DTR lead to ON when the port is not actively online.

Menu 4.2.2.13: 03*The state of the EIA lead RTS when connected is

Selecting this menu item toggles the value on or off. The default is ON.

Setting this menu item to ON sets the RTS lead to ON when the port is online.

Menu 4.2.2.13: 04*The state of the EIA lead DTR when connected is

Selecting this menu item toggles the value on or off. The default is ON.

Setting this menu item sets the DTR lead to ON when the port is online.

Menu 4.2.2.13: 05*When disconnecting toggle the EIA lead RTS is

Selecting this menu item toggles the value on or off. The default is OFF.

When the toggle feature is used, either the RTS or DTR signal level can be specified as a toggle bit. With the toggle enabled, the idle state of the bit will be inverted for 2 seconds and will be returned to the idle programmed state at disconnect time.

To specify the RTS level as a toggle bit, set this menu item to ON.

Menu 4.2.2.13: 06*When disconnecting toggle the EIA lead DTR is

Selecting this menu item toggles the value on or off. The default is OFF.

When the toggle feature is used, either the RTS or DTR signal level can be specified as a toggle bit. With the toggle enabled, the idle state of the bit will be inverted for 2 seconds and will be returned to the idle programmed state at disconnect time.

To specify the DTR signal level as a toggle bit, set this menu item to ON.

Menu 4.2.2.13: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the menu items on Menu 4.2.2.13. This menu item returns you to Menu 4.2.2 and keeps your changes until you save them (see menu item 4.2.2.20) or discard them (see menu item 4.2.2.21).

Menu 4.2.2.13: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.2. Any changes made on Menu 4.2.2.13 will not be retained unless you exit using menu item 4.2.2.20.

By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.3: Configure as AI193/194 Ethernet card with slot expansion of

Menu 4.2.3 describes the configuration settings for the AI 193/194 ethernet cards.

```
                                                                  Menu 4.2.3
01 Base IP address (0.0.0.1..255.255.255.254)-------------------000.000.000.001
02 Maximum range of low-order IP address byte (0..255)----------------------000
03 Domain name server # 1 IP address (0.0.0.0..255.255.255.254)-000.000.000.000
04 Domain name server # 2 IP address (0.0.0.0..255.255.255.254)-000.000.000.000
05 SNMP client #1 trap IP address (0.0.0.0..255.255.255.254)----000.000.000.000
06 SNMP client #2 trap IP address (0.0.0.0..255.255.255.254)----000.000.000.000
07 IP gateway # 1 address (0.0.0.0..255.255.255.254)------------000.000.000.000
08 IP gateway # 2 address (0.0.0.0..255.255.255.254)------------000.000.000.000
09+Set Ethernet performance parameters
10 Default domain description string
---
12*Disconnection destroys buffered data-----------------------------------OFF
13+Port Descriptions
.
.
20 Retain these changes for saving in Menu 4
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.3: 01 Base IP address (0.0.0.1..255.255.255.254)

Enter the IP address of the Ethernet card. Example: 89.0.0.100. This value must be changed. The default is `0.0.0.1`.

Menu 4.2.3: 02 Maximum range of low-order IP address byte (0..255)

Enter an integer value between 0 and 255. The default is `0`.

This menu item indicates the upper range of the IP addresses of the Ethernet card. By default, the card will only accept an incoming call to the base IP address. However, you can use this parameter to specify a range of addresses.

In keeping with the example above, if you desire the Ethernet card to answer any call in the range of 89.0.0.100 through 89.0.0.120, then you would set this value to 120.

Menu 4.2.3: 03 Domain name server #1 IP address (0.0.0.0..255.255.255.254)

Enter the IP address for the primary domain name server for your network. (A domain name server is a computer that is used to resolve host computer names to IP addresses.)

If your network does not have a domain name server, then set this menu item to a value of 0.0.0.0 (the default).

Menu 4.2.3: 04 Domain name server #2 IP address (0.0.0.0..255.255.255.254)

Enter the IP address for the secondary domain name server for your network. If your network does not have a secondary (backup) domain name server, then set this parameter to a value of 0.0.0.0 (the default).

Menu 4.2.3: 05 SNMP client # 1 trap IP address (0.0.0.0..255.255.255.254)

See Menu 4.2.3: 06 SNMP client # 2 trap IP address (0.0.0.0..255.255.255.254).

Menu 4.2.3: 06 SNMP client # 2 trap IP address (0.0.0.0..255.255.255.254)

Menu items 05 and 06 specify the IP addresses for the SNMP management stations (clients) that are to receive any traps generated by the SNMP server running on the CLC.

Traps are SNMP messages which are automatically sent to the management stations defined in these menu items. The purpose of a trap is to notify the management stations of some special condition or event. The AI193 TCP/IP card, for example, issues two types of traps:

- A coldstart trap indicates that the AI193 TCP/IP software has restarted.
- An authentication failure trap indicates that the AI193 SNMP software received an SNMP message with an invalid community string.

You can specify from zero to two SNMP client systems. An SNMP trap IP address of 0.0.0.0 (the default) is used to indicate a nonexistent SNMP client.

Menu 4.2.3: 07 IP gateway #1 address (0.0.0.0..255.255.255.254)

See Menu 4.2.3: 08 IP gateway #2 address (0.0.0.0..255.255.255.254).

Menu 4.2.3: 08 IP gateway #2 address (0.0.0.0..255.255.255.254)

A gateway is a switch that forwards Internet Protocol (IP) packets from LANs to WANs or between separate LANs. If your network uses IP gateways, these two menu items (07 and 08) can be used to specify their IP addresses. If your system does not use IP gateways, configure these two menu items with a value of 0.0.0.0 (the default).

When booted, the interface card sends an Address Resolution Protocol (ARP) request to IP gateway #1. If a reply is received, then gateway #1 will be used by the interface card.

If no reply is received from IP gateway #1, an ARP request is sent to IP gateway #2. If a reply is received, then IP gateway #2 will be used by the interface card.

The interface card uses static routing; therefore, should the active gateway fail, the card must be restarted to change the gateway being used.

09+Set Ethernet Performance Parameters

Menu 4.2.3.9 is used to set Ethernet parameters that control the performance of the TCP/IP software.

CAUTION: Do not change any of these parameters unless you are a qualified network engineer or instructed to do so by the manufacturer.

See Menu 4.2.3.9: Set Ethernet performance parameters on page D-17 for specific menu item descriptions.

Menu 4.2.3: 10 Default domain description string

This menu item can be used to specify an optional default domain name server string. This string is appended to the string entered at the `Enter an Internet address` prompt.

For example, if all of the computers on your network are within the .aiinet domain, then you can enter **`.aiinet`** as your default domain description string. Then, to connect to the aicorp .aiinet computer, you need to specify the string aicorp in response to the Internet address prompt.

The entered domain name server string will appear on screen immediately below the line for this menu item.

Menu 4.2.3: 12*Disconnection destroys buffered data

Selecting this menu item toggles the value on or off. The default is `OFF`. When set to `OFF`, the call cannot be torn down until all buffered data has been transmitted. When set to `ON`, a call tear down causes all untransmitted buffered data to be lost.

Menu 4.2.3: 13+Port Descriptions

When you select this menu item, Menu 4.2.3.13 appears. This menu allows you to view and record the descriptions of the AI194 ports. See Menu 4.2.3.13: AI194 Port Descriptions on page D-20 for specific menu item descriptions.

Menu 4.2.3: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the menu items on Menu 4.2.3. This returns you to Menu 4 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.3: 21 Exit this menu with no changes

Select this menu item to return to Menu 4. Any changes made on Menu 4.2.3 will not be retained unless you exit using menu item 4.2.3.20.

By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.3.9: Set Ethernet performance parameters

Use this menu to set Ethernet parameters that control the performance of the TCP/IP software.

CAUTION: Do not change any of these parameters unless you are a qualified network engineer or instructed to do so by the manufacturer.

```
                                                                Menu 4.2.3.9
01 Call retry timer (1..255 sec)-----------------------------------------060
02 Subnet mask (0.0.0.1..255.255.255.254)------------------------255.255.255.0
03 Retransmit timeout value (1..255 ticks, 62ms/tick)----------------------007
04 Maximum roundtrip timeout (1..255 sec)--------------------------------001
05 Minimum roundtrip timeout (1..255 ticks, 62ms/tick)----------------------001
06 Domain name server timeout (1..255 sec)-------------------------------010
07 IP cache time (1..255 min)--------------------------------------------006
08 ARP reply timeout (1..255 sec)----------------------------------------018
09 Maximum receive packet size (1..64 16 byte paragraphs)------------------032
10 Maximum transmit packet size (1..64 16 byte paragraphs)-----------------032
11 Maximum segment size (1..64 16 byte paragraphs)-------------------------032
12 Maximum number of bytes without an ACK (1..64 16 byte paragraphs)--------064
13 Window size (1..64 16 byte paragraphs)---------------------------------064
14 Internet control message size (1..64 16 byte paragraphs)----------------019
.
.
20 Retain these changes for saving in Menu 4
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.3.9: 01 Call retry timer (1...255 sec)

Enter an integer value between 1 and 255 seconds. The default is `60`.

This menu item sets the number of seconds during which the system attempts to place a TCP call before a time-out occurs.

Menu 4.2.3.9: 02 Subnet mask (0.0.0.1..255.255.255.254)

This menu item identifies the network address portion of the IP address. The default is `255.255.255.0`.

Menu 4.2.3.9: 03 Retransmit time-out value (1..255 ticks, 62ms/tick)

Enter an integer value between 1 and 255 clock ticks. Each clock tick is 62 milliseconds. The default is `7`.

This menu item defines the time-out per Ethernet packet level retransmission.

Menu 4.2.3.9: 04 Maximum roundtrip timeout (1..255 sec)

Enter an integer value between 1 and 255 seconds. The default is `1`.

This menu item sets the maximum time allotted to transmit a packet and receive a reply.

Menu 4.2.3.9: 05 Minimum roundtrip timeout (1..255 ticks, 62ms/tick)

Enter an integer value between 1 and 255 clock ticks. Each clock tick is 62 milliseconds. The default is `1`.

This menu item sets the minimum time allotted to transmit a packet and receive a reply.

Menu 4.2.3.9: 06 Domain name server timeout (1..255 sec)

Enter an integer value between 1 and 255 seconds. The default is `10`.

This menu item sets the maximum expected time to receive a reply from a domain name server.

Menu 4.2.3.9: 07 IP cache time (1..255 min)

Enter an integer value between 1 and 255 minutes. The default is `6`.

This menu item sets the amount of time that the IP address is retained in the cache memory.

Menu 4.2.3.9: 08 ARP reply timeout (1..255 sec)

Enter an integer value between 1 and 255 seconds. The default is `18`.

This menu item sets the maximum amount of time allotted to receive a response to an ARP request.

Menu 4.2.3.9: 09 Maximum receive packet size (1..64 16 byte paragraphs)

Enter an integer value between 1 and 64. The default is `32`.

This menu item sets the maximum receive packet size. The number of bytes reserved is 16 times the value entered.

Menu 4.2.3.9: 10 Maximum transmit packet size (1..64 16 byte paragraphs)

Enter an integer value between 1 and 64. The default is `32`.

This menu item sets the maximum transmit packet size. The number of bytes reserved is 16 times the value entered.

Menu 4.2.3.9: 11 Maximum segment size (1..64 16 byte paragraphs)

Enter an integer value between 1 and 64. The default is `32`.

This menu item sets the maximum size of TCP packet segments. The number of bytes reserved is 16 times the value entered.

Menu 4.2.3.9: 12 Maximum number of bytes without an ACK (1..64 16 byte paragraphs)

Enter an integer value between 1 and 64. The default is 64.

This menu item sets maximum number of bytes without an ACK. The number of bytes reserved is 16 times the value entered.

Menu 4.2.3.9: 13 Window size (1..64 16 byte paragraphs)

Enter an integer value between 1 and 64. The default is 64.

This menu item sets the maximum receive and transmit buffer sizes. The number of bytes reserved is 16 times the value entered.

Menu 4.2.3.9: 14 Internet control message size (1..64 16 byte paragraphs)

Enter an integer value between 1 and 64. The default is 19.

This menu item sets the size of the message buffer. The number of bytes reserved is 16 times the value entered.

Menu 4.2.3.9: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the menu items on Menu 4.2.3.9. This returns you to Menu 4.2.3 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.3.9: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.3. Any changes made on Menu 4.2.3.9 will not be retained unless you exit using menu item 4.2.3.9.20.

By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.3.13: AI194 Port Descriptions

Use this menu to view and record AI194 port descriptions for ports 1 through 24.

```
                                                              Menu 4.2.3.13
01 Port 01 Description-- PC 1
02 Port 02 Description-- XYZ Device
03 Port 03 Description--
04 Port 04 Description--
05 Port 05 Description--
06 Port 06 Description--
07 Port 07 Description--
08 Port 08 Description--
09 Port 09 Description--
10 Port 10 Description--
11 Port 11 Description--
12 Port 12 Description--
.
.
19 View port descriptions 13-24
20 Save these changes
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.3.13: 01 through 12 Port Descriptions

Select one of these menu items to record a description for a port between 1 and 12. When you select one of these menu items and enter a description, the system redisplays Menu 4.2.3.13 with the description you entered.

Note: The description is limited to 55 characters.

Menu 4.2.3.13: 19 View port descriptions 13-24

Enter **19** to toggle between port descriptions 1-12 and 13-24.

Menu 4.2.3.13: 20 Save these changes

Select this menu item after you have finished entering the descriptions of your ports 1 through 24 on Menu 4.2.3.13. This returns you to Menu 4.2.3 and keeps your changes.

Menu 4.2.3.13: 21 Exit this menu with no changes

Select this menu item to return to menu 4.2.3. Any changes made on Menu 4.2.3.13 will not be retained unless you exit using menu item 4.2.3.13.20.

By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of

Menu 4.2.4 describes the configuration settings for the AI192/196 X.25 network cards.

```
                                                                  Menu 4.2.4
01 Link number to set with these parameters (1..4)----------------------------1
02 Minimum LCN set aside for PVC use (0..255)---------------------------------000
03 Maximum LCN set aside for PVC use (0..255)---------------------------------000
04 Minimum LCN set aside for SVC use (0..255)---------------------------------001
05 Maximum LCN set aside for SVC use (0..255)---------------------------------004
06+Baud rate is internal at 9600
07+CCITT link is (DCE) with active disconnect
08+Maximum packet size is 128
09+Frame level modulus is 8
10 Frame level window variable k is------------------------------------------007
11 T1 timer (2..200 tenths of a sec)------------------------------------------030
12 N2 counter (2..32)---------------------------------------------------------20
13+Packet level modulus is 8
14 Packet level window variable W is------------------------------------------002
15 Packetizing timer (0..255 hundredths of sec)-------------------------------006
16+Protocol processing is-----------------------------------------------------OFF
17+Set X.25 facilities
18*Link is-------------------------------------------------------------------OFF

20 Retain these changes for saving in Menu 4
21 Exit this menu
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4: 01 Link Number to set with these parameters (1..4)

Enter an integer value between 1 and 4. The default is `1`. This menu item identifies the Link (1, 2, 3, or 4) for which X.25 parameters are being configured.

Type the link number or, to apply the parameters entered to all four links, type:

```
1,copy
```

This copies your settings to all links when the menu item 4.2.4.20 is selected.

Menu 4.2.4: 02 Minimum LCN set aside for PVC use (0..255)

Enter an integer value between 0 and 255 that is equal to or less than the value entered in menu item 4.2.4.3. The default is `0`.

This menu item enables you to set the minimum Logical Channel Number (LCN) used for a PVC.

Use zero for this menu item when PVCs are not used.

Menu 4.2.4: 03 Maximum LCN set aside for PVC use (0..255)

Enter an integer value between 0 and 255 that is equal to or greater than the value entered in menu item 4.2.4.2. The default is `0`.

This menu item enables you to set the maximum LCN used for a PVC. The range of PVCs must not overlap the range of SVCs as set below.

Use zero for this menu item when PVCs are not used.

Menu 4.2.4: 04 Minimum LCN set aside for SVC use (0..255)

Enter an integer value between 0 and 255. This value must be greater than the value entered in menu item 4.2.4.3 and equal to or less than the value entered in menu item 4.2.4.5. The default is `1`.

This menu item enables you to set the minimum LCN used for a SVC. The range of SVCs must not overlap the range of PVCs.

Use zero for this menu item when SVCs are not used.

Menu 4.2.4: 05 Maximum LCN set aside for SVC use (0..255)

Enter an integer value between 0 and 255 that is equal to or greater than the value entered in menu item 4.2.4.4. The default is `4`.

This menu item enables you to set the maximum LCN used for a SVC. The range of SVCs must not overlap the range of PVCs.

Use zero for this menu item when SVCs are not used.

Menu 4.2.4: 06+Baud rate is internal at 9600

When you select this menu item, Menu 4.2.4.6 appears. It is used for setting the baud rate for the X.25 interface card.

The external clock is the normal setting when using a modem. The internal rates 1200 through 128000 are used with local connections and a null modem cable.

The current setting is displayed in menu item 4.2.4.6. The default Baud rate is internal at 9600.

See Menu 4.2.4.6: Baud rate is internal at 9600 for menu item descriptions.

Menu 4.2.4: 07+CCITT link is (DCE) with active disconnect

When you select this menu item, Menu 4.2.4.7 appears. This menu is used to set the selected link configuration: CCITT or DDN; DTE or DCE; active or passive disconnect.

The current setting appears in Menu Item 4.2.4.7. The default is CCITT link (DCE) with active disconnect.

See Menu 4.2.4.7: CCITT link is (DCE) with active disconnect for specific menu item descriptions.

Menu 4.2.4: 08+Maximum packet size is 128

When you select this menu item, Menu 4.2.4.8 appears. You can use this menu to select a packet size in bytes between 128 and 1024.

The current setting is displayed in menu item 4.2.4.8. The default is `128`.

See Menu 4.2.4.8: Maximum packet size is 128 for specific menu item descriptions.

Menu 4.2.4: 09+Frame level modulus is 8

When you select this menu item, Menu 4.2.4.9 appears. You can use this menu to set the maximum frame level window size. If the modulus is 8, the valid window size is an integer from 1 to 7; if the modulus is 128, the valid window size is an integer from 1 to 127.

The current setting is displayed in menu item 4.2.4.9. The default is `8`.

See Menu 4.2.4.9: Frame level modulus is 8 on page D-27 for specific menu item descriptions.

Menu 4.2.4: 10 Frame level window variable k is

This menu item allows you to select the maximum number for the frame level window variable.

If the modulus defined in menu item 4.2.4.9 is 8, the valid value is an integer from 1 to 7. The normal default is 7 for a modulus of 8.

If the modulus is 128, the valid range is an integer from 1 to 127.

Menu 4.2.4: 11 T1 timer (2..200 tenths of sec)

This menu item is the retransmission timer. Enter an integer between 2 and 200, representing tenths of seconds (0.2 to 20 seconds). The default is `30` (3 seconds).

Menu 4.2.4: 12 N2 counter (2..32)

This menu item allows you to set maximum number of retransmissions. Enter an integer from 2 to 32. The default is `20`.

Menu 4.2.4: 13+Packet level modulus is 8

When you select this menu item, Menu 4.2.4.13 appears. You can use this menu to set the packet level window size. If the modulus is 8, the valid window size is an integer from 1 to 7; if the modulus is 128, the valid window size is an integer from 1 to 127.

The current setting is displayed in menu item 4.2.4.13. The default is `8`.

See Menu 4.2.4.13: Packet level modulus is 8 on page D-28 for specific menu item descriptions.

Menu 4.2.4: 14 Packet level window variable W is

This menu item allows you to select the maximum number for the packet level window size.

If the modulus defined in menu item 4.2.4.13 is 8, then the valid value is an integer between 1 and 7. The normal default is 2 for a modulus of 8.

If the modulus is 128, the valid value is an integer from 1 to 127.

Menu 4.2.4: 15 Packetized timer (0..255 hundredths of sec)

Enter an integer value between 0 and 255 hundredths of a second. The default is 6.

This menu item allows you to set the delay timer for outgoing (to network) packets. The larger the time value, the longer the delay before packets are sent to the network. Longer delay times also tend to increase the number of bytes per packet.

Menu 4.2.4: 16+Protocol processing is

When you select this menu item, Menu 4.2.4.16 appears. This allows you to specify the type of protocol processing on an X.25 interface card.

Protocol processing settings affect all calls on a given link but can be overridden by the per-call protocol parameters set in Menu 8.

The current setting is displayed in menu item 4.2.4.16.

See Menu 4.2.4.16: Protocol processing is on page D-28 for specific menu item descriptions.

Menu 4.2.4: 17+Set X.25 facilities

When you select this menu item, Menu 4.2.4.17 appears. This menu allows you to enable or disable X.25 facilities options.

See Menu 4.2.4.17: Set X.25 facilities on page D-30 for specific menu item descriptions.

Menu 4.2.4: 18*Link is

Selecting this menu item toggles the value on or off. The default is OFF. Select this menu item to enable or disable this link.

Menu 4.2.4: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the items on Menu 4.2.4. This returns you to Menu 4.2 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.4: 21 Exit this menu

Select this menu item to return to Menu 4.2. Any changes made here on Menu 4.2.4 will not be retained unless you exit using menu item 4.2.4.20. By exiting through this item, any changes you made here will revert to the previously configured values.

Menu 4.2.4.6: Baud rate is internal at 9600

This is an X.25 interface card configuration submenu. Use this menu to set the baud rate for the X.25 interface card.

The external clock is the normal setting when using a modem. The internal rates 1200 through 128000 are used with local connections and a null modem cable. The current setting is displayed in menu item 4.2.4.6. The default Baud rate is internal at 9600.

```
                                                                Menu 4.2.4.6
01 Baud rate is bit synchronized by external clock
02 Baud rate is internal at 1200
03 Baud rate is internal at 2400
04 Baud rate is internal at 4800
05 Baud rate is internal at 9600
06 Baud rate is internal at 19200
07 Baud rate is internal at 38400
08 Baud rate is internal at 56000
09 Baud rate is internal at 64000
10 Baud rate is internal at 128000
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.6: 01 through 10: Baud rate is

Selecting one of these menu items sets that baud rate for the X.25 link and returns you to Menu 4.2.4 where the selected baud rate is then displayed. The default baud rate is internally synchronized at 9600.

The external clock is the normal setting when using a modem. The internal rates 1200 through 128000 are used with local connections and a null modem cable.

Menu 4.2.4.6: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.4 without changing the baud rate.

Menu 4.2.4.7: CCITT link is (DCE) with active disconnect

This is an X.25 interface card configuration submenu. See Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of on page D-21 for more information.

```
                                                              Menu 4.2.4.7
01 CCITT link is (DTE) with active disconnect
02 CCITT link is (DCE) with active disconnect
03 CCITT link is (DTE) with passive disconnect
04 CCITT link is (DCE) with passive disconnect
05 DDN Link is (DTE) with active disconnect
06 DDN Link is (DCE) with active disconnect
07 DDN Link is (DTE) with passive disconnect
08 DDN Link is (DCE) with passive disconnect
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.7: 01 through 08

Use these menu items to configure the selected link for CCITT or DDN, Data Terminal Equipment (DTE) or Data Communications Equipment (DCE), and either active or passive disconnect.

Selecting one of these menu items sets that combination of parameters and returns you to Menu 4.2.4 where the selection is then displayed. The default is CCITT link is (DCE) with active disconnect.

In an active disconnect mode, a disconnect (DISC) frame is sent, and a UA must be received to acknowledge the link disconnect. Some systems do not acknowledge the DISC frame with a UA but send an SABM instead. To bring this link up, the system must be configured for a passive disconnect.

In a passive disconnect mode, the DISC frame is not sent. The AI180 responds to an SABM with a UA.

Menu 4.2.4.7: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.4 without changing the CCITT or DDN link parameters.

Menu 4.2.4.8: Maximum packet size is 128

This is an X.25 interface card configuration submenu. See Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of on page D-21 for more information.

```
                                                                Menu 4.2.4.8
01 Maximum packet size is 128
02 Maximum packet size is 256
03 Maximum packet size is 512
04 Maximum packet size is 1024
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.8: 01 through 04: Maximum packet size is

Selecting one of these menu items sets the maximum packet size in bytes between 128 and 1024. This also returns you to Menu 4.2.4 where the selection is then displayed. The default is 128.

Menu 4.2.4.8: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.4 without changing the packet size.

Menu 4.2.4.9: Frame level modulus is 8

This is an X.25 interface card configuration submenu. See Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of on page D-21 for more information.

```
                                                                Menu 4.2.4.9
01 Frame level modulus is 8
02 Frame level modulus is 128
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.9: 01 and 02: Frame level modulus is

These menu items are used to set the maximum frame level window size.

If the modulus is 8, the valid window size is an integer from 1 to 7. If the modulus is 128, the valid window size is an integer from 1 to 127.

Making a selection returns you to Menu 4.2.4 where the selection is then displayed. The default is 8.

Menu 4.2.4.9: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.4 without changing the frame level modulus.

Menu 4.2.4.13: Packet level modulus is 8

This is an X.25 interface card configuration submenu. See Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of on page D-21 for more information.

```
                                                                Menu 4.2.4.13
01 Packet level modulus is 8
02 Packet level modulus is 128
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.13: 01 and 02: Packet level modulus is

These menu items are used to set the maximum packet level window size.

If the modulus is 8, the valid window size is an integer from 1 to 7. If the modulus is 128, the valid window size is an integer from 1 to 127.

Making a selection returns you to Menu 4.2.4 where the selection is then displayed. The default is 8.

Menu 4.2.4.13: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.4 without changing the packet level modulus.

Menu 4.2.4.16: Protocol processing is

This is an X.25 interface card configuration submenu. See Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of on page D-21 for more information.

```
                                                                Menu 4.2.4.16
01*X-ON / X-OFF flow control is-------------------------------------------OFF
02*NMA communications protocol--------------------------------------------OFF
03*OPS/INE communications protocol----------------------------------------OFF
04*TL1 Packetizing--------------------------------------------------------OFF
.
.
20 Retain these changes for saving in Menu 4
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.16: 01 X-ON / X-OFF flow control is

Selecting this menu item toggles the value on or off. The default is OFF.

This menu item allows you to turn on or off X-ON/X-OFF flow control at the software level. Flow control set to ON will pace the transfer of data to prevent characters from being lost.

Menu 4.2.4.16: 02 NMA communications protocol

Selecting this menu item toggles the value on or off. The default is OFF.

This menu item allows you to turn on or off the Network Monitoring & Analysis (NMA) communications protocol.

When set to ON, the protocol will affect incoming calls only. Before the call packet is forwarded, the called address is copied to the call user data field (up to 12 characters), and the NMA is placed in the address field.

Enabling both the NMA and OPS/INE protocol processing will have the same effect as enabling NMA only. Since NMA and the OPS/INE are mutually exclusive, and only one can operate at any given time, NMA takes precedence.

Menu 4.2.4.16: 03 OPS/INE communications protocol

Selecting this menu item toggles the value on or off. The default is OFF.

This menu item allows you to turn on or off the Operations Process System/Intelligent Network Element (OPS/INE) communications protocol.

When set to ON, the protocol will affect incoming calls only. The called address is copied to the call user data field (up to 12 characters), and the OPS/INE is placed in the address field before the call packet is forwarded.

Enabling both the NMA and OPS/INE protocol processing will have the same effect as enabling NMA only. Since NMA and the OPS/INE are mutually exclusive, and only one can operate at any given time, NMA takes precedence.

Menu 4.2.4.16: 04 TL1 Packetizing

Selecting this menu item toggles the value on or off. The default is OFF.

This menu item allows you to turn on or off the TL1 packetizing communications protocol.

When set to ON, this menu item activates the TL1 parser on this link. Its purpose is to assure that each TL1 message is properly packetized so that none of the data is fragmented.

Menu 4.2.4.16: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the menu items on Menu 4.2.4.16. This returns you to Menu 4.2.4 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.4.16: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.4. Any changes made on Menu 4.2.4.16 will not be retained unless you exit using menu item 4.2.4.16.20.

By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.4.17: Set X.25 facilities

This is an X.25 interface card configuration submenu. See Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of on page D-21 for more information.

```
                                                                Menu 4.2.4.17
01 Response timer T2 is (0..255 tenths of a sec)----------------------------003
02 Idle link disconnect timer T3 is (0..255 sec)----------------------------000
03 Restart request timer T20 is (0..255 sec)--------------------------------180
 ////////////////////////////////////////////////////////////////////////////
 //  Refer to Dallas DS2180A data sheet for a description of T1 parameters.  //
 //  The X.25 facilities are described in the System Manager's Manual.       //
 //  Unless special features are required, defaults settings should be used. //
 //  Warning:  Improper settings may result in failure of the link.          //
 ////////////////////////////////////////////////////////////////////////////
10 T1 transceiver CCR -- common control register----------------------------4C
11 T1 transceiver TCR -- transmit control register--------------------------08
12 T1 transceiver RCR -- receive control register---------------------------80
13+Line build out -- DSX-1 crossconnect; 133 to 266 feet ( 40 to  80 meters)
14 Special frame and packet features bit mask is (0000..ffff hex)----------0000
15 Negotiation facilities bit mask is (0000..ffff hex)---------------------0000
16 Charging facilities bit mask is (0000..ffff hex)------------------------0000
17 Miscellaneous facilities bit mask is (0000..ffff hex)-------------------0000


20 Retain these changes for saving in Menu 4
21 Exit this menu
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.17: 01 Response timer T2 is (0..255 tenths of sec)

Enter an integer value from 0 to 255, representing tenths of seconds (0 to 25.5 seconds). The default is 3 (0.3 seconds).

T2 indicates the time available from receiving a frame until a response has to be transmitted to arrive at the destination before its timer T1 runs out.

Menu 4.2.4.17: 02 Idle link disconnect timer T3 is (0..255 sec)

Enter an integer value from 0 to 255 seconds. The default is 0.

T3 is the idle timer. If the link is in an idle channel state for more than T3 seconds, it reports to the packet level as being down. All virtual calls over this link will be cleared, and all PVCs will be reset.

A value of 0 (the default) indicates there is no limit.

03 Restart request timer T20 is (0..255 sec)

Enter an integer value from 0 to 255 seconds. The default is 180.

The T20 timer is started after sending a restart request and is stopped at the receipt of a restart indication or restart confirmation.

Menu 4.2.4.17: 10 T1 transceiver CCR — common control register

This is a Dallas DS2180A setting. The default is 4C.

Note: This value must be set to 4C or 5C when this configuration is for the AI192 with the optional AI010 daughter card. 4C enables standard superframe mode. 5C enables extended superframe mode.

Menu 4.2.4.17: 11 T1 transceiver TCR -- transmit control register

This is a Dallas DS2180A setting. The default is 8.

Note: Do not change this value from the default of 8.

Menu 4.2.4.17: 12 T1 transceiver RCR — receive control register

This is a Dallas DS2180A setting. The default is 80.

Note: Do not change this value from the default of 80.

Menu 4.2.4.17: 13+Line build out -- DSX-1 crossconnect; 133 to 266 feet (40 to 80 meters)

When selected, Menu 4.2.4.17.13 is displayed. This submenu allows you to select the length of the line build out for each DSX-1 interface. You can select a loop length from 0 to 655 feet (0 to 200 meters).

The current setting is displayed here on this menu item. The default is 0 to 133 feet.

See Menu 4.2.4.17.13: Line build out -- DSX-1 crossconnect; 133 to 266 feet (40 to 80 meters) on page D-32 for specific menu item descriptions.

Menu 4.2.4.17: 14 Special frame and packet features bit mask is (0000..ffff hex)

See Menu 4.2.4.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex).

Menu 4.2.4.17: 15 Negotiation facilities bit mask is (0000..ffff hex)

See Menu 4.2.4.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex).

Menu 4.2.4.17: 16 Charging facilities bit mask is (0000..ffff hex)

See Menu 4.2.4.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex).

Menu 4.2.4.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex)

Enter a hexadecimal value from 0000 to FFFF.

The facility and features bit masks provide potential for ON/OFF control over special X.25 characteristics. The bit mask assignments are interface card and release version dependent. Refer your specific interface card user's manual for additional information.

Menu 4.2.4.17: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the items on Menu 4.2.4.17. This returns you to Menu 4.2.4 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.4.17: 21 Exit this menu

Select this menu item to return to Menu 4.2.4. Any changes made here on Menu 4.2.4.17 will not be retained unless you exit using menu item 4.2.4.17.20.

By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.4.17.13: Line build out -- DSX-1 crossconnect; 133 to 266 feet (40 to 80 meters)

This is an X.25 interface card configuration submenu. See Menu 4.2.4: Configure as AI192/196 X.25 network card with slot expansion of on page D-21 for more information.

```
                                                                Menu 4.2.4.17.13
01 Line build out -- DSX-1 crossconnect;   0 to 133 feet (  0 to  40 meters)
02 Line build out -- DSX-1 crossconnect; 133 to 266 feet ( 40 to  80 meters)
03 Line build out -- DSX-1 crossconnect; 266 to 399 feet ( 80 to 120 meters)
04 Line build out -- DSX-1 crossconnect; 399 to 533 feet (120 to 160 meters)
05 Line build out -- DSX-1 crossconnect; 533 to 655 feet (160 to 200 meters)
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.4.17.13: 01 through 05: Line build out -- DSX-1 crossconnect

These menu items allow you to select the length of the line build out for each DSX-1 interface.

Making a selection returns you to Menu 4.2.4.17 where the selection is then displayed. The default is 0 to 133 feet.

Menu 4.2.4.17.13: 21 Exit this menu with no changes

This returns you to Menu 4.2.4.17 without changing the line build out.

Menu 4.2.5: Configure as ASP or Advanced Smart Line Card with slot expansion of

Menu 4.2.5 describes the configuration settings for an Advanced Smart Line Card.

```
                                                          Menu 4.2.5 pg 1
01
02
03
04
05
06
07
08
09
10
11
12
13
14

16 Previous page [,page]
17 Next page
18 Insert line
19 Delete line
20 Retain these changes for saving
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.5: 01 through 14

Enter strings containing initialization commands for the ASP or advanced interface card on these lines. When you restart the AI180, the system sends these **winslc** commands as the final step in the initialization sequence. See Chapter 8: Commands from the AI Prompt for information about winslc and the user's manual for your ASP or specific interface card.

See menu item 1.9.1 for details about entering strings for these menu items.

Select menu item 4.2.5.20 to retain the menu items entered for saving in Menu 4. When you restart the AI180, the system executes these commands as the final step in the initialization sequence.

To prevent executing the commands on this list during a restart, press ESC on the craft port during the initialization before phase 1 is complete. (See CLC Initialization on page 2-4 in Chapter 2: Quick-Start Configuration.)

Menu 4.2.5: 16 Previous page [,page]

Select this menu item to display the previous page of this menu. To view or change the strings on a specific page, enter the following:

16,*page*

page is the specific page number between 1 and 999.

Menu 4.2.5: 17 Next page

Select this menu item to display or change the strings on the next page of this menu.

Menu 4.2.5: 18 Insert line

Select this menu item to insert a blank line on the page. This blank line can then be used for an additional command string. To insert a line, enter the following:

18,*line*

line is the number of the inserted line between 1 and 14. The strings on the specified line and the lines following it will move down one line.

Menu 4.2.5: 19 Delete line

Select this menu item to delete the strings contained on a specified line. To delete a line, enter the following:

19,*line*

line is the number of the deleted line between 1 and 14. The lines following the deleted line will move up.

Menu 4.2.5: 20 Retain these changes for saving

Select this menu item after you have finished configuring commands. This returns you to Menu 4 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.5: 21 Exit this menu with no changes

Select this menu item to return to Menu 4. Any changes made on Menu 4.2.5 will not be retained unless you exit using menu item 4.2.5.20.

By exiting through this menu item, any changes made here will revert to the previously configured values.

Menu 4.2.12: Configure as AI192/196 with full menu support

This menu allows you to configure all links on either an AI192 or an AI196-X Version 7.20 or higher with AI198 menus.

```
                                                                  Menu 4.2.12
01 Link number to set with these parameters (1..16)-------------------------01
02 Minimum LCN set aside for PVC use (0..4095)------------------------------0000
03 Maximum LCN set aside for PVC use (0..4095)------------------------------0000
04 Minimum LCN set aside for SVC use (0..4095)------------------------------0001
05 Maximum LCN set aside for SVC use (0..4095)------------------------------0004
06+Baud rate is ------------------------------------------------------------  9600
07+CCITT link is (DCE) with active disconnect
08*Maximum packet size (128, 256, 512, 1024)------------------------------- 128
09+PVC configuration
10+Frame level information
11 T1 Timer (2..200 tenths of a sec)----------------------------------------030
12 N2 counter (2..32)-------------------------------------------------------20
13+Packet level information
14 Link Description---------
15 Packetizing Timer (0..255 hundredths of sec)-----------------------------006
16+Protocol processing is---------------------------------------------------OFF
17+Set X.25 facilities
18*Link state--------------------------------------------------------------OFF

20 Retain these changes for saving in Menu 4
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12: 01 Link number to set with these parameters (1..16)

Enter an integer value between 1 and 16. The default is 1. This menu item identifies the link (1-16) for which X.25 parameters are being configured.

Copying Information to other Links

Type the link number to apply X.25 and/or PVC parameters for the current link to one or more other links, enter the following:

1 copy *n-m*

n A single port number or the lowest port number in a range of ports from *n* to *m*.

m The highest port number in a range of ports from *n* to *m*.

This copies the settings from the displayed port to all specified ports.

For example, **1 copy 3-5** copies the current port information for the displayed port to ports 3, 4, and 5.

Individual ports can be included by using commas as separators. For example, **1 copy 3,7-9,13** copies the current port information for the displayed port to ports 3, 7, 8, 9, and 13.

Menu 4.2.12: 02 Minimum LCN set aside for PVC use (0..4095)

Enter an integer value between 0 and 4095 that is equal to or less than the value entered in menu item 4.2.12.3. The default is 0.

This menu item enables you to set the minimum Logical Channel Number (LCN) used for a PVC. Use zero for this menu item when PVCs are not used.

Menu 4.2.12: 03 Maximum LCN set aside for PVC use (0..4095)

Enter an integer value between 0 and 4095 that is equal to or greater than the value entered in menu item 4.2.12.2. The default is 0.

This menu item enables you to set the maximum LCN used for a PVC. The range of PVCs must not overlap the range of SVCs as set below. Use zero for this menu item when PVCs are not used.

Menu 4.2.12: 04 Minimum LCN set aside for SVC use (0..4095)

Enter an integer value between 0 and 4095. This value must be greater than the value entered in menu item 4.2.12.3 and equal to or less than the value entered in menu item 4.2.12.5. The default is 1.

This menu item enables you to set the minimum LCN used for a SVC. The range of SVCs must not overlap the range of PVCs. Use zero for this menu item when SVCs are not used.

Menu 4.2.12: 05 Maximum LCN set aside for SVC use (0..4095)

Enter an integer value between 0 and 4095 that is equal to or greater than the value entered in menu item 4.2.12.4. The default is 4.

This menu item enables you to set the maximum LCN used for a SVC. The range of SVCs must not overlap the range of PVCs. Use zero for this menu item when SVCs are not used.

Menu 4.2.12: 06+Baud rate is

When you select this menu item, Menu 4.2.12.6 appears. Use this menu to set the baud rate for the X.25 interface card. The current setting is displayed in menu item 4.2.12.6. The default Baud rate is internal at 9600. See Menu 4.2.12.6: Baud rate is on page D-39 for menu item descriptions.

Menu 4.2.12: 07+CCITT link is (DCE) with active disconnect

When you select this menu item, Menu 4.2.12.7 appears. Use this menu to set the selected link configuration: CCITT or DDN; DTE or DCE; active or passive disconnect.

The current setting appears in Menu Item 4.2.12.7. The default is `CCITT link (DCE) with active disconnect`. See Menu 4.2.12.7: CCITT link is (DCE) with active disconnect on page D-39 for specific menu item descriptions.

Menu 4.2.12: 08*Maximum packet size (128, 256, 512, 1024)

Select this menu item and press ENTER until you have selected the packet size in bytes. To select the size you want, select this toggle menu item and press ENTER until the size you want appears at the right. The packet sizes available are 128, 256, 512, or 1024. The default packet size is 128.

Menu 4.2.12: 09+PVC configuration

You must first use menu items 4.2.12.2 and 4.2.12.3 to define at least one PVC before you can select this menu item. When you select this menu item, Menu 4.2.12.9 appears. This menu is a summary of all the configured PVCs for an X.25 link on the AI296. See Menu 4.2.12.9: PVC configuration on page D-40 for specific menu item descriptions.

Menu 4.2.12: 10+Frame level information

This submenu allows you to specify the frame level modulus and the frame level window size. See Menu 4.2.12.10: Frame level information on page D-43 for more information.

Menu 4.2.12: 11 T1 Timer (2..200 tenths of a sec)

This menu item is the retransmission timer. Enter an integer between 2 and 200, representing tenths of seconds (0.2 to 20 seconds). The default is 30 tenths of a second (3 seconds).

Menu 4.2.12: 12 N2 counter (2..32)

This menu item allows you to set maximum number of retransmissions. Enter an integer from 2 to 32. The default is 20.

Menu 4.2.12: 13+Packet level information

This submenu allows you to specify the packet level modulus and the packet level window size. See Menu 4.2.12.13: Packet level information on page D-44 for more information.

Menu 4.2.12: 14 Link Description

Type a description associated with the selected link. Enter up to 50 valid ASCII characters for the description; commas are not valid in this menu item.

Menu 4.2.12: 15 Packetizing Timer (0..255 hundredths of sec)

Enter an integer value between 0 and 255 hundredths of a second. The default is 6.

This menu item allows you to set the delay timer for outgoing (to network) packets. The larger the time value, the longer the delay before packets are sent to the network. Longer delay times also tend to increase the number of bytes per packet.

Menu 4.2.12: 16+Protocol processing is

When you select this menu item, Menu 4.2.12.16 appears. This allows you to specify the type of protocol processing on an X.25 interface card.

Protocol processing settings affect all calls on a given link but can be overridden by the per-call protocol parameters set in Menu 8.

The current setting is displayed in menu item 4.2.12.16. See Menu 4.2.12.16: Protocol processing is on page D-45 for specific menu item descriptions.

Menu 4.2.12: 17+Set X.25 facilities

When you select this menu item, Menu 4.2.12.17 appears. This menu allows you to enable or disable X.25 facilities options. See Menu 4.2.12.17: Set X.25 Facilities on page D-47 for specific menu item descriptions.

Menu 4.2.12: 18*Link State

Selecting this menu item toggles the value on or off. The default is OFF. Select this menu item to enable or disable this link.

Menu 4.2.12: 20 Retain these changes for saving in Menu 4

Select this menu item after you have finished configuring the items on Menu 4.2.12. This returns you to Menu 4.2 and keeps your changes until you save them (menu item 4.20) or discard them (menu item 4.21).

Menu 4.2.12: 21 Exit this menu with no changes

Select this menu item to return to Menu 4. Any changes made here on Menu 4.2.12 will not be retained unless you exit using menu item 4.2.12.20. By exiting through this item, any changes you made here will revert to the previously configured values.

Menu 4.2.12.6: Baud rate is

This is an X.25 interface card configuration submenu. Use this menu to set the baud rate for the X.25 link. The current setting is displayed in menu item 4.2.12.6. The default baud rate is internal at 9600.

```
                                                              Menu 4.2.12.6
1   externally clocked
2   internally clocked at 1200   baud
3   internally clocked at 2400   baud
4   internally clocked at 4800   baud
5   internally clocked at 9600   baud
6   internally clocked at 19200  baud
7   internally clocked at 38400  baud
8   internally clocked at 56000  baud
9   internally clocked at 64000  baud
10  internally clocked at 128000 baud
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.6: 01 through 10: Baud rate is

Selecting one of these menu items sets that baud rate for the X.25 interface card and returns you to Menu 4.2.12 where the selected baud rate displays. The default is `internally clocked at 9600 baud`.

Menu 4.2.12.6: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.12 without changing the baud rate.

Menu 4.2.12.7: CCITT link is (DCE) with active disconnect

This is an X.25 interface card configuration submenu.

```
                                                              Menu 4.2.12.7
1  CCITT link is (DTE) with active disconnect
2  CCITT link is (DCE) with active disconnect
3  CCITT link is (DTE) with passive disconnect
4  CCITT link is (DCE) with passive disconnect
5  DDN link is (DTE) with active disconnect
6  DDN link is (DCE) with active disconnect
7  DDN link is (DTE) with passive disconnect
8  DDN link is (DCE) with passive disconnect
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.7: 01 through 08

Use these menu items to configure the selected link for CCITT or DDN, Data Terminal Equipment (DTE) or Data Communications Equipment (DCE), and either active or passive disconnect.

Selecting one of these menu items sets that combination of parameters and returns you to Menu 4.2.12 where the selection is then displayed. The default is `CCITT link is (DCE) with active disconnect.`

In an active disconnect mode, a disconnect (DISC) frame is sent, and a user agent (UA) must be received to acknowledge the link disconnect. Some systems do not acknowledge the DISC frame with a UA but send a Set Asynchronous Balanced Mode (SABM) instead. To bring this link up, the system must be configured for a passive disconnect. In a passive disconnect mode, the DISC frame is not sent. The card responds to an SABM with a UA.

Menu 4.2.12.7: 21 Exit this menu with no changes

This menu item returns you to Menu 4.2.12 without changing the CCITT or DDN link parameters.

Menu 4.2.12.9: PVC configuration

This menu is a summary of all the configured PVCs for a link. You can also use this menu to create and edit PVCs for specified X.25 links. You must first define at least one PVC before you can access this menu.

```
 >9
                                                                  Menu 4.2.12.9
   PVC Type  LCN Range    CallTmr    ResetTmr    InActTmr
02+
03+
04+
05+
06+
07+
08+
09+
10+
11+
12+
13+
14+
15+

17 Display first page
18 Display next page
19 Delete entry
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.9: 02+ through 15+

These menu items allow you to create and edit PVCs for an X.25 link on the AI192 or AI196-X card.

If you select a blank menu item and press ENTER, Menu 4.2.12.9.1 (see PVC Edit Menu on page D-42) appears. From the PVC Edit Menu, you can enter new PVCs.

After you have created a new PVC, the system returns you to Menu 4.2.12.9 and displays the new PVC.

If you select an existing menu item and press ENTER, Menu 4.2.12.9.1 (PVC Edit Menu) appears. From the PVC Edit Menu, you can edit the existing PVC parameters. After you have modified the existing PVC parameters, the system returns you to Menu 4.2.12.9 and displays any corrections you have made to an existing PVC. Select these menus to further editing.

```
>2
                                                                Menu 4.2.12.9.1
01*PVC Type (Active, Connect on activity, Passive)---------------------- Active
02 LCN Low (* for all LCNs for the link)-----------------------------------0001
03 LCN High (* for all LCNs for the link)----------------------------------0001
04 CALL Timer Interval (seconds)------------------------------------------015
.
.
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.9: 17 Display first page

Select this menu item to view the first page of configured PVC information for the current link.

Menu 4.2.12.9: 18 Display next page

Select this menu item to view additional pages of configured PVC information for the current link.

Menu 4.2.12.9: 19 Delete entry

Select this menu item to delete a configured PVC or range of PVCs. To delete a PVC, enter the following:

19,*line*

To delete a range of PVCs, enter the following:

19,2 3 5-7

Lines 2, 3, 5, 6, and 7 will be deleted. The lines following will move up.

Type **19 *** to delete all lines.

Menu 4.2.12.9: 20 Save the changes made

Select this menu item after you have finished configuring the menu items on Menu 4.2.12.9. This returns you to Menu 4.2.12 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.12.9: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.12. Any changes made on Menu 4.2.12.9 will not be retained unless you exit using menu item 4.2.12.9.20. By exiting through this menu item, any changes you made here will revert to the previously configured values.

PVC Edit Menu

You can configure an existing PVC for an X.25 link by selecting an existing PVC from Menu 4.2.12.9 and pressing ENTER. You can also configure the PVC type, the LCN range, and the timer value. A screen similar to this appears:

```
                                                                Menu 4.2.12.9.1
01*PVC Type (Active, Connect on activity, Passive)-----------------------
Active
02 LCN Low (* for all LCNs for the link)----------------------------------
0001
03 LCN High (* for all LCNs for the link)---------------------------------
0001
04 CALL Timer Interval (seconds)-----------------------------------------
015
.
.
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

PVC Edit Menu: 01*PVC type (Active, Connect on activity, Passive)

Select this menu item and press ENTER until you have selected the PVC type you want. The system redisplays Menu 4.2.12.9.1 with the value you selected. Valid options are `Active`, `Connect on activity`, and `Passive`. The default setting is `Passive`.

Active PVCs attempt to connect as soon as a link is up. If an immediate connection is not made, the PVC continues trying to connect at a specified time interval. This time interval is established by the call timer (ct) setting.

Connect on activity PVCs only connect when data is received over them. A connect on activity PVC remains dormant until it receives an X.25 data packet from the network. When the connect on activity PVC receives a data packet, it initiates a connection. When the connection is established, the connect on activity PVC sends the first data packet, and the data transfer proceeds normally.

Passive PVCs make no attempt to connect. When passive PVCs do not transmit data for a specific interval of time, the AI196-X sends a RESET packet to the X.25 network. This time interval is established by the reset timer (it).

PVC Edit Menu: 02 LCN Low (* for all LCNs for the link)

Select this menu item to configure the minimum LCN for the PVCs you want to configure. If you type (*), the system configures all LCNs for the link by what you defined in menu item 4.2.12.9. The valid range is 1 to 4095. The default setting is 1.

PVC Edit Menu: 03 LCN high (* for all LCNs for the link)

Select this menu item to configure the maximum LCN for the PVCs you want to configure. The valid range is 1 to 4095. The default setting is 1.

PVC Edit Menu: 04 CALL Timer Interval (seconds)

Select this menu item to configure the call timer interval. The type of timer configured depends on the PVC type.

Table D-1 PVC and Timer Type

PVC Type	Timer Type	Valid Timer Values
Active PVC	Call Timer	1-600; default 15
Connect on Activity PVC	Inactivity Timer	0-600; 0 means the activity timer has been disabled; default 20
Passive PVC	Reset Timer	1-600; default 15

PVC Edit Menu: 20 Save the changes made

Select this menu item after you have finished configuring the menu items on Menu 4.2.12.9.1. (PVC Edit Menu). This returns you to Menu 4.2.12.9 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

PVC Edit Menu: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.12.9. Any changes made on Menu 4.2.12.9.1 (PVC Edit Menu) will not be retained unless you exit using menu item 4.2.12.9.1.20. By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.12.10: Frame level information

This menu allows you to specify the frame level modulus and the frame level window size.

```
                                                          Menu 4.2.12.10
01*Frame level modulus (8 or 128) is----------------------------------------008
02 Frame level window size (1..7)-------------------------------------------007
.
.
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.10: 01*Frame level modulus (8 or 128) is

Select this menu item and press ENTER to toggle the maximum frame level window size. The options are 8 or 128. The default value is 8.

Menu 4.2.12.10: 02 Frame level window size

Select this item to set the specific frame level window size. If the frame level modulus is 8, then the valid window size is 1 to 7. If the frame level modulus is 128, then the valid window size is 1 to 127. The default value is 2.

Menu 4.2.12.10: 20 Save the changes made

Select this menu item after you have finished configuring the menu items on Menu 4.2.12.10. This returns you to Menu 4.2.12 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.12.10: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.12. Any changes made on Menu 4.2.12.10 will not be retained unless you exit using menu item 4.2.12.10.20. By exiting through this menu item, any changes you made here will revert to the previously configured values. This menu item returns you to Menu 4.2.12 without saving changes.

Menu 4.2.12.13: Packet level information

This menu allows you to specify the packet level modulus and the packet level window size.

```
                                                          Menu 4.2.12.13
01*Packet level modulus (8 or 128) is-------------------------------------008
02 Packet level window size (1..7)----------------------------------------002
.
.
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.13: 01*Packet level modulus is (8 or 128)

Select this menu item to toggle between values for the maximum packet level window size. The options are 8 or 128. The default is 8.

Menu 4.2.12.13: 02 Packet level window size

Select this menu item to set the specific packet level window size. If the packet level modulus is 8, then the valid range of packet level window sizes is 1 to 7. If the packet level modulus is 128, then the valid range of packet level window sizes is 1 to 127. The default packet level window size is 2.

Menu 4.2.12.13: 20 Save the changes made

Select this menu item after you have finished configuring the menu items on Menu 4.2.12.13 This returns you to Menu 4.2.12 and keeps your changes until you save them (menu item 4.20) or discard them (menu item 4.21).

Menu 4.2.12.13: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.12. Any changes made on Menu 4.2.12.13 will not be retained unless you exit using menu item 4.2.12.13.20. By exiting through this menu item, any changes you made here will revert to the previously configured values. This menu item returns you to Menu 4.2.12 without saving changes.

Menu 4.2.12.16: Protocol processing is

```
                                                          Menu 4.2.12.16
01*X-ON / X-OFF flow control is-------------------------------------------OFF
02*NMA communications protocol is-----------------------------------------OFF
03*OPS/INE communications protocol is-------------------------------------OFF
04*TL1 packetizing is-----------------------------------------------------OFF
.
.
20 Save the changes made
21 Exit this menu with no changes
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.16: 01*X-ON / X-OFF flow control is

Selecting this menu item toggles the value on or off. The default is OFF.

This menu item allows you to turn on or off X-ON/X-OFF flow control at the software level. Flow control set to ON will pace the transfer of data to prevent characters from being lost.

Menu 4.2.12.16: 02*NMA communications protocol is

Selecting this menu item toggles the value on or off. The default is OFF.

This menu item allows you to turn on or off the Network Monitoring & Analysis (NMA) communications protocol.

When set to ON, the protocol will affect incoming calls only. Before the call packet is forwarded, the called address is copied to the call user data field (up to 12 characters), and the NMA is placed in the address field.

Enabling both the NMA and Operations Process System/Intelligent Network Element (OPS/INE) protocol processing will have the same effect as enabling NMA only. Since NMA and the OPS/INE are mutually exclusive, and only one can operate at any given time. NMA takes precedence.

Menu 4.2.12.16: 03*OPS/INE communications protocol is

Selecting this menu item toggles the value on or off. The default is OFF. This menu item allows you to turn on or off the Operations Process System/Intelligent Network Element (OPS/INE) communications protocol.

When set to ON, the protocol will affect incoming calls only. The called address is copied to the call user data field (up to 12 characters), and the OPS/INE is placed in the address field before the call packet is forwarded.

Enabling both the NMA and OPS/INE protocol processing will have the same effect as enabling NMA only. Since NMA and the OPS/INE are mutually exclusive, and only one can operate at any given time. NMA takes precedence.

Menu 4.2.12.16: 04*TL1 Packetizing is

Selecting this menu item toggles the value on or off. The default is OFF. This menu item allows you to turn on or off the TL1 packetizing communications protocol. When set to ON, this menu item activates the TL1 parser on this link. Its purpose is to assure that each TL1 message is properly packetized so that none of the data is fragmented.

Menu 4.2.12.16: 20 Save the changes made

Select this menu item after you have finished configuring the menu items on Menu 4.2.12.16. This returns you to Menu 4.2.12 and keeps your changes until you save them (menu item 4.20) or discard them (menu item 4.21).

Menu 4.2.12.16: 21 Exit this menu with no changes

Select this menu item to return to Menu 4.2.12. Any changes made on Menu 4.2.12.16 will not be retained unless you exit using menu item 4.2.12.16.20. By exiting through this menu item, any changes you made here will revert to the previously configured values. This menu item returns you to Menu 4.2.12 without saving changes.

Menu 4.2.12.17: Set X.25 Facilities

```
                                                              Menu 4.2.12.17
01 Response timer T2 is (0..255 tenths of a sec)----------------------------003
02 Idle link disconnect timer T3 is (0..255 sec)----------------------------000
03 Restart request timer T20 is (0..255 sec)--------------------------------180
////////////////////////////////////////////////////////////////////////////////
//  Refer to Dallas DS2180A data sheet for a description of T1 parameters.   //
//  The X.25 facilities are described in the System Manager's Manual.        //
//  Unless special features are required, default settings should be used.   //
//  Warning:  Improper settings may result in failure of the link.           //
////////////////////////////////////////////////////////////////////////////////
10 T1 transceiver CCR -- common control register----------------------------4c
11 T1 transceiver TCR -- transmit control register--------------------------08
12 T1 transceiver RCR -- receive control register---------------------------80
13+Line build out -- DSX-1 crossconnect;   0   to 133 feet (  0 to  40 meters)
14 Special frame and packet features bit mask is (0000..ffff hex)----------0000
15 Negotiation facilities bit mask is (0000..ffff hex)----------------------0000
16 Charging facilities bit mask is (0000..ffff hex)-------------------------0000
17 Miscellaneous facilities bit mask is (0000..ffff hex)--------------------0000


20 Save the changes made
21 Exit this menu
Enter item number and optional ",value" then push <CR> key
```

Menu 4.2.12.17: 01 Response timer T2 is (0..255 tenths of sec)

Enter an integer value from 0 to 255, representing tenths of seconds (0 to 25.5 seconds). The default is 3 tenths of a second (0.3 seconds).

T2 indicates the time available from receiving a frame until a response has to be transmitted to arrive at the destination before its timer T1 runs out.

Menu 4.2.12.17: 02 Idle link disconnect timer T3 is (0..255 sec)

Enter an integer value from 0 to 255 seconds. The default is 0.

T3 is the idle timer. If the link is in an idle channel state for more than T3 seconds, it reports to the packet level as being down. All virtual calls over this link will be cleared, and all PVCs will be reset.

A value of 0 (the default) indicates that the T3 timer has been disabled.

Menu 4.2.12.17: 03 Restart request timer T20 is (0..255 sec)

Enter an integer value from 0 to 255 seconds. The default is 180.

The T20 timer is started after sending a restart request and is stopped at the receipt of a restart indication or restart confirmation.

Menu 4.2.12.17: 10 T1 transceiver CCR — common control register

This is a Dallas DS2180A setting. The default is 4C.

Note: This value must be set to 4C or 5C when this configuration is for the AI192 with the optional AI010 daughter card. 4C enables standard superframe mode. 5C enables extended superframe mode.

Menu 4.2.12.17: 11 T1 transceiver TCR — transmit control register

This is a Dallas DS2180A setting. You must type two digits (example: 08). The default is 8.

Note: Do not change this value from the default of 8.

Menu 4.2.12.17: 12 T1 transceiver RCR — receive control register

This is a Dallas DS2180A setting. You must type two digits (example: 08). The default is 80.

Note: Do not change this value from the default of 80.

Menu 4.2.12.17: 13+Line build out -- DSX-1 crossconnect; 0 to 133 feet (40 to 80 meters)

When selected, Menu 4.2.12.17.13 is displayed. This submenu allows you to select the length of the line build out for each DSX-1 interface. You can select a loop length from 0 to 655 feet (0 to 200 meters).

The current setting is displayed here on this menu item. The default is 0 to 133 feet (0 to 40 meters).

See Menu 4.2.12.17.13: Line build out -- DSX-1 crossconnect; 0 to 133 feet (0 to 40 meters) on page D-49 for specific menu item descriptions.

Menu 4.2.12.17: 14 Special frame and packet features bit mask is (0000..ffff hex)

See Menu 4.2.12.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex).

Menu 4.2.12.17: 15 Negotiation facilities bit mask is (0000..ffff hex)

See Menu 4.2.12.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex).

Menu 4.2.12.17: 16 Charging facilities bit mask is (0000..ffff hex)

See Menu 4.2.12.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex).

Menu 4.2.12.17: 17 Miscellaneous facilities bit mask is (0000..ffff hex)

For these four menu items (14-17), enter a hexadecimal value from 0000 to FFFF. You must type four digits (example: 0001).

The facility and features bit masks provide potential for ON/OFF control over special X.25 characteristics. The bit mask assignments are interface card and release version dependent. Refer to your specific interface card user's manual for additional information.

Menu 4.2.12.17: 20 Save the changes made

Select this menu item after you have finished configuring the items on Menu 4.2.12.17. This returns you to Menu 4.2.12 and keeps your changes until you save them (see menu item 4.20) or discard them (see menu item 4.21).

Menu 4.2.12.17: 21 Exit this menu

Select this menu item to return to Menu 4.2.12. Any changes made here on Menu 4.2.12.17 will not be retained unless you exit using menu item 4.2.12.17.20. By exiting through this menu item, any changes you made here will revert to the previously configured values.

Menu 4.2.12.17.13: Line build out -- DSX-1 crossconnect; 0 to 133 feet (0 to 40 meters)

This is an X.25 interface card configuration submenu.

```
                                                                Menu 4.2.12.17.13
01 Line build out -- DSX-1 crossconnect;   0   to 133 feet (  0 to  40 meters)
02 Line build out -- DSX-1 crossconnect;   133 to 266 feet ( 40 to  80 meters)
03 Line build out -- DSX-1 crossconnect;   266 to 399 feet ( 80 to 120 meters)
04 Line build out -- DSX-1 crossconnect;   399 to 533 feet (120 to 160 meters)
05 Line build out -- DSX-1 crossconnect;   533 to 655 feet (160 to 200 meters)
.
.
21 Exit this menu with no changes
Enter item number and optional ",value" then test push <CR> key
```

Menu 4.2.12.17.13: 01 through 05: Line build out -- DSX-1 crossconnect

These menu items allow you to select the length of the line build out for each DSX-1 interface.

Making a selection returns you to Menu 4.2.12.17 where the selection is then displayed. The default is `0 to 133 feet (0 to 40 meters)`.

Menu 4.2.12.17.13: 21 Exit this menu with no changes

This returns you to Menu 4.2.12.17 without changing the line build out.

Acronyms and Abbreviations

Table 1 Acronyms and Abbreviations

Acronym	Meaning
ACK	Acknowledgement (positive)
ACTA	Administrative Council for Terminal Attachments
AEP	Applied Innovation Encapsulation Protocol
AEPN	Applied Innovation Encapsulated Protocol with the Network option
AI	Applied Innovation Inc.
ALS	Address Lookup Server
AMI	Alternate Mask Inversion
ANSI	American National Standards Institute
AS	Autonomous System
ASBDR	Autonomous System Boundary Router
ASP	Application Service Provider
ARP	Address Resolution Protocol
ASCII	American Standard Code for Information Interchange
BAM	Bistate Alarm Module
BCP	Bridging Control Protocol
BER	Bit Error Rate
BERT	Bit Error Rate Test
BOC	Bell Operating Company
BPDU	Bridge Protocol Data Unit
BRI	Basic Rate Interface

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
C	Common
CAAML	Centralized Autonomous AI Message Logging
CALLR	Call Request Packet
CALLA	Call Accepted Packet
CALLC	Call Connected Packet
CCI	Command and Control Interface
CCITT	Consultative Committee on International Telegraphy and Telephony
CD	Carrier Detect
CEV	Controlled Environment Vault
CHAP	Challenge-Handshake Authentication Protocol
CLC	Common Logic Controller
CLEC	Competitive Local Exchange Carrier
CLEI	Common Language Equipment Identifier
CLNP	Connectionless Network Protocol
CLRC	Clear Confirmation Packet
CLRI	Clear Indication Packet
CLRR	Clear Request Packet
CPE	Customer Premises Equipment
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
CRT	Cathode Ray Tube
CTS	Clear to Send
CUD	Call User Data
DAD	Data Acquisition Device
DCD	Data Carrier Detect

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
DCE	Data Circuit Terminating Equipment or Data Communication Equipment
DCN	Data Communications Network
DLC	Data Link Control
DLCI	Data Link Connection Identifier (Information)
DNS	Domain Name Service
DSR	Data Set Ready
DSX	Digital System Cross-Connect
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
EEPROM	Electronically Erasable Programmable Read-Only Memory
EIA	Electronic Industries Association
EM	Element Manager
EMI	Electro Magnetic Interference
EPROM	Erasable Programmable Read-Only Memory
ES	End System
ESD	Electrostatic Discharge
ES-IS	End System to Intermediate System
EST	Eastern Standard Time
FCC	Federal Communications Commission
FDM	Frequency Division Multiplexing
FDX	Full Duplex
FGND	Frame Ground
FIC	Faculty Interface Code
FOC	Fiber Optics Communications
FTAM	File Transfer, Access, and Management

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
FTP	File Transfer Protocol
GRE	Generic Routing Encapsulation
GUI	Graphical User Interface
HDLC	High Level Data Link Control
I/O	Input/Output
ICALL	Incoming Call Packet
ICMP	Internet Control Message Protocol
ID	Identification
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
IPCP	IP Control Protocol
IPX	Internetwork Packet Exchange
IRB	Inter-repeater Bus
IS	Intermediate System
ISDN	Integrated Services Digital Network
IS-IS	Intermediate System to Intermediate System
ISO	International Standards Organization
ISP	Internet Service Provider
ITU	International Telecommunication Union
IXE	IP Protocol over X.25 Encapsulation
JRE	Java Runtime Environment
LAN	Local Area Network
LAPB	Link Access Protocol - Balanced
LBO	Line Build Out
LSA	Link State Advertisement

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
LCN	Logical Channel Number
LED	Light Emitting Diode
LLC	Logical Link Control
MAC	Media Access Control
MAN	Metropolitan Area Network
MCI	Master Communications Interface
MD	Mediation Device
MIB	Management Information Base
MMF	Multimode Fiber Optic Cable
MUX	Multiplexer
NAK	Negative Acknowledgment
NC	Normally Closed
NE	Network Element
NEBS	Network Equipment Building System
NEC	National Electrical Code
NI	Network Interface
NLPID	Network Layer Protocol Identifier
NMS	Network Management System
NO	Normally Opened
NOC	Network Operations Center
NSA	Nonservice Affecting
NSAP	Network Service Access Point
NTP	Network Time Protocol
NVT	Network Virtual Terminal
OAM&P	Operations, Administration, Maintenance, and Provisioning

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
ODBC	Open Database Connectivity
OS	Operating System
OSI	Open Systems Interconnection
OSPF	Open Shortest Path First
OSS	Operating Support System
PAD	Packet Assembler Disassembler
PAP	Password Authentication Protocol
PBX	Private Branch eXchange
PC	Personal Computer
PDU	Protocol Data Unit
PID	Private ID or password
POTS	Plain Old Telephone Service
PPP	Point-to-Point Protocol
PRI	Primary Rate Interface
PROM	Programmable Read Only Memory
PUC	Public Utility Commission
PVC	Permanent Virtual Connection
QAM	Quadrature Amplitude Modulation
QoS	Quality of Service
QPLC	Quad Physical Layer Controller
QTAM	Queued Telecommunications Access Method (IBM)
RAM	Random Access Memory
RAM	Router Access Module
RAS	Remote Access Server
RBOC	Regional Bell Operating Company

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
RCV	Receiver
RD	Routing Domain
REN	Ringer Equivalence Number
RF	Radio Frequency
RIP	Routing Information Protocol
RMON	Remote Network Monitoring Specification
ROM	Read Only Memory
RTS	Request to Send
RXD	Receive Data
SAM	Serial Alarm Module
SAP	Service Advertisement Protocol
SCC	Specialized Common Carrier
SCCS	Switching Center Control System
SCID	SONET Circuit ID
SDH	Synchronous Digital Hierarchy
SG	Signal Ground
SID	System Identification number
SLC	Smart Line Card
SLIP	Serial Line Interface Protocol
SMF	Single Mode Fiber
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SNTP	Simple Network Time Protocol
SONET	Synchronous Optical Network
SQL	Structured Query Language

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
STP	Shielded Twisted Pair
STP	Spanning Tree Protocol
SVC	Switched Virtual Connection
TACACS	Terminal Access Controller Access System
TARP	TID Address Resolution Protocol
TBOS	Telemetry Byte Oriented Serial
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol over Internet Protocol
TCP/UDP	User Datagram Protocol
TDM	Time Division Multiplexing
TDMA	Time Division Multiple Access
TELCO	Telephone Company
TFTP	Trivial File Transfer Protocol
TID	Target Identifier
TL1	Transaction Language One
TTL	Time to Live
TXD	Transmit Data
UA	Unnumbered Acknowledgement
UDP	User Datagram Protocol
UL	Underwriters Laboratories
UTC	Universal Coordinated Time
UTP	Unshielded Twisted Pair
VC	Virtual Channel
VLAN	Virtual LAN
VT	Virtual Terminal

Table 1 Acronyms and Abbreviations (Continued)

Acronym	Meaning
WAN	Wide Area Network
WINSLC	Window to a Smart Line Card
XKMS	XML Key Management Specification
XNS	Xerox Network Services
ZIP	Zone Information Protocol