



**HOTWIRE™ DSLAM  
FOR 8310 MVL™ AND 8510 DSL  
CARDS**

**USER'S GUIDE**

**Document No. 8000-A2-GB26-00**

**PARADYNE™**

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# About This Guide

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## Document Purpose and Intended Audience

This guide describes how to configure and operate the software component of the Hotwire Digital Subscriber Line Access Multiplexer (DSLAM) system. It is intended for administrators and operators who maintain the networks that support Hotwire operation.

A basic understanding of internetworking protocols and their features is assumed. Specifically, you should have familiarity with Simple Network Management Protocol (SNMP), Network Management Systems (NMSs), and the following internetworking concepts:

- TCP/IP applications
- IP and subnet addressing
- IP forwarding (also referred to as IP routing)
- Bridging

It is also assumed that you have already installed either the Hotwire 8600 or 8800 DSLAM. If you have not done so already, refer to the appropriate Hotwire DSLAM Installation Guide for installation instructions.

### **NOTE:**

It is highly recommended that you read the *Hotwire DSLAM for 8310 MVL and 8510 DSL Cards Network Configuration Guide* before you begin to use this guide and the Hotwire software. The *Hotwire DSLAM for 8310 MVL and 8510 DSL Cards Network Configuration Guide* provides introductory information about the Hotwire DSLAM network model and theories.

## Document Summary

<b>Section</b>	<b>Description</b>
Chapter 1	<i>Hotwire DSLAM System Description.</i> Provides an overview of the Hotwire 8600 and 8800 systems.
Chapter 2	<i>Hotwire Menus and Screens.</i> Describes the operation of Hotwire menus, screens, and commonly used navigation keys. Also provides instructions on how to log in and log out of the system.
Chapter 3	<i>Initial Setup Instructions.</i> Provides instructions on how to access the system for the first time, as well as instructions on performing initial setup tasks.
Chapter 4	<i>Configuring the Hotwire DSLAM.</i> Describes the required procedures for configuring the Hotwire system.
Chapter 5	<i>8310 MVL and 8510 DSL Card Configuration.</i> Describes the optional procedures for configuring the DSL cards on the Hotwire system.
Chapter 6	<i>Monitoring the Hotwire DSLAM.</i> Describes operator programs that monitor the Hotwire system.
Chapter 7	<i>Diagnostics and Troubleshooting.</i> Describes common Hotwire operational problems and solutions.
Appendix A	<i>Download Code and Apply Download.</i> Describes how to work with the Download Code and Apply Download menus.
Appendix B	<i>Traps.</i> Describes the traps that are generated by the Hotwire system.
Glossary	Defines acronyms and terms used in this document.
Index	Lists key terms, acronyms, concepts, and sections in alphabetical order.



## Product-Related Documents

<b>Document Number</b>	<b>Document Title</b>
5020-A2-GN10	<i>Hotwire 5020 POTS Splitter Central Office Installation Instructions</i>
5030-A2-GN10	<i>Hotwire 5030 POTS Splitter Customer Premises Installation Instructions</i>
5038-A2-GN10	<i>Hotwire 5038 Distributed POTS Splitter Customer Premises Installation Instructions</i>
5038-A2-GN11	<i>Hotwire 5038 MVL POTS Filter Customer Premises Installation Instructions</i>
5620-A2-GN10	<i>Hotwire 5620 RTU Customer Premises Installation Instructions</i>
6020-A2-GZ40	<i>Hotwire 6020 MVL POTS Splitter Central Office Installation Instructions</i>
6310-A2-GN10	<i>Hotwire 6310 MVL Modem Customer Premises Installation Instructions</i>
8000-A2-GB22	<i>Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide</i>
8000-A2-GB27	<i>Hotwire DSLAM for 8310 MVL and 8510 DSL Cards Network Configuration Guide</i>
8000-A2-GS40	<i>Hotwire DSLAM Configuration for 8310 MVL and 8510 DSL Cards Startup Instructions</i>
8310-A2-GZ40	<i>Hotwire 8310 MVL Card Installation Instructions</i>
8510-A2-GZ40	<i>Hotwire 8510 DSL Card Installation Instructions</i>
8600-A2-GN20	<i>Hotwire 8600 Digital Subscriber Line Access Multiplexer (DSLAM) Installation Guide</i>
8800-A2-GN21	<i>Hotwire 8800 Digital Subscriber Line Access Multiplexer (DSLAM) Installation Guide</i>

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# Hotwire DSLAM System Description

# 1

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## What is the Hotwire DSLAM?

The Hotwire™ Digital Subscriber Line Access Multiplexer (DSLAM) is a DSL platform that houses a Management Communications Controller (MCC) card and up to 18 DSL cards. These can be 8310 Multiple Virtual Lines (MVL™) cards, 8510 Rate Adaptive Digital Subscriber Line (RADSL) cards, or a combination of both.

### **NOTE:**

All references to DSL cards refer to both RADSL and MVL cards, unless specifically noted otherwise.

The DSLAM interoperates with two types of Hotwire Service Nodes (SNs)/endpoints to deliver applications at high speeds in support of packet services over a Digital Subscriber Line (DSL) link.

- The 8310 MVL card interoperates with the Hotwire 6310 MVL modem.
- The 8510 DSL card interoperates with the Hotwire 5620 SN.

The DSLAM is a set of central site products that terminate and consolidate packet data traffic from many customers in a serving area. It then forwards the traffic to one or more network access provider networks.

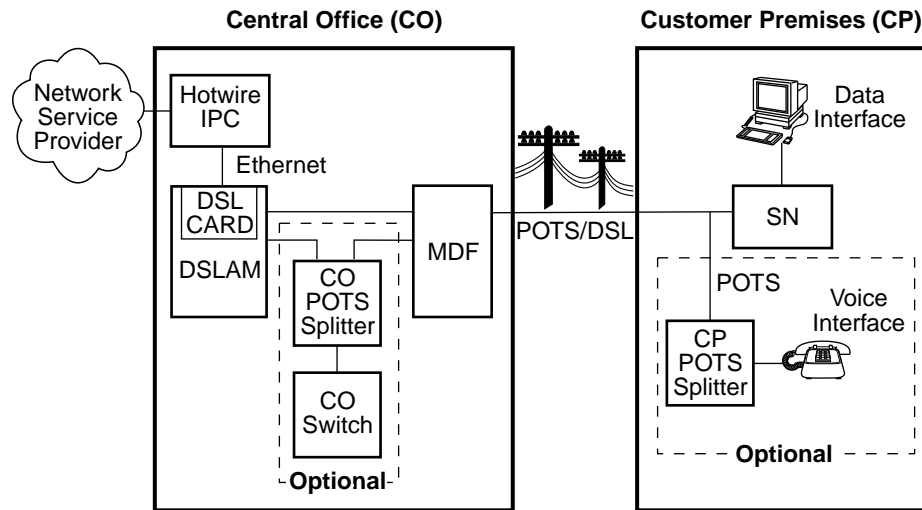
High-speed Internet and intranet access is achieved via a bridge from the DSL links and then concentrated for efficient forwarding to backbone networks. By enabling very high speeds using DSL technology and concentrating Internet Protocol (IP) traffic, greater performance is realized.

In addition, the Hotwire DSLAM with an endpoint such as a 6310 MVL modem and 5620 SN can co-exist with Plain Old Telephone Service (POTS) over the same copper telephone line, providing simultaneous usage of POTS and digital applications. That is, the optional POTS splitters (Hotwire 5020 Central Office POTS Splitter and Hotwire 5030 or 5038 Customer Premises POTS Splitter) allow simultaneous voice and data connections over a standard telephone line.

**NOTE:**

If you would like more information on DSL-based services, applications, and network deployment, refer to Paradyne's *DSL Sourcebook*. The book may be ordered by calling 1-800-PARADYNE or through Paradyne's World Wide Web Site at <http://www.paradyne.com>.

The following illustration shows a typical Hotwire configuration.



Legend: DSL - Digital Subscriber Line      SN - Service Node  
 MDF - Main Distribution Frame      POTS - Plain Old Telephone Service  
 IPC - Interworking Packet Concentrator

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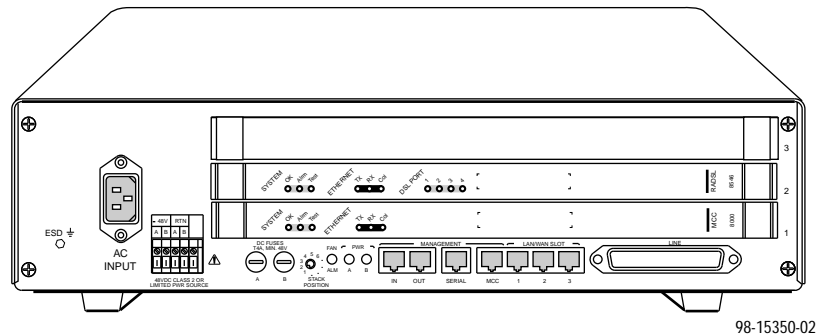
## Hotwire DSLAM Components

The Hotwire DSLAM system consists of the following components:

- **Hotwire DSLAM chassis**

There are two types of chassis:

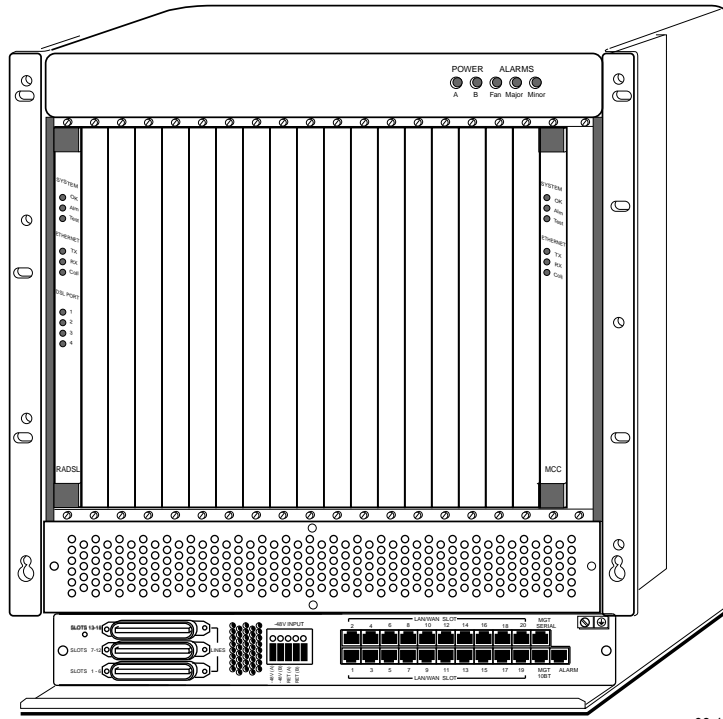
- The **Hotwire 8600 DSLAM** chassis is an independent, standalone system. The stackable design provides for up to six chassis to share management access through a single MCC card, which in turn, allows an additional slot for a DSL card in each of up to five additional chassis.



In a stacked configuration, the first, or base chassis, must contain an MCC card in Slot 1. In addition to the MCC card, the base chassis can house up to two DSL cards. Each additional chassis in the stack houses up to three DSL cards.

For more information about the Hotwire 8600 DSLAM chassis, see the *Hotwire 8600 Digital Subscriber Line Access Multiplexer (DSLAM) Installation Guide*.

- The **Hotwire 8800 DSLAM** chassis is a 20-slot chassis designed to house up to 18 DSL cards and one MCC card. (The remaining slot is reserved for future use.)



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For more information about the Hotwire 8800 DSLAM chassis, see the *Hotwire 8800 Digital Subscriber Line Access Multiplexer (DSLAM) Installation Guide*.

- **One Management Communications Controller (MCC) card**

The chassis requires one MCC card, which is a processor card that administers and provides diagnostic connectivity to the DSL cards. It acts as a mid-level manager and works in conjunction with a Simple Network Management Protocol (SNMP) system, such as Paradyne's OpenLane™ DCE Manager for HP OpenView, via its LAN port. It gathers operational status for each of the DSL cards and responds to the SNMP requests. It also has a serial port for a local user interface to the DSLAM.

For more information about the Hotwire MCC card, see the *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.

- **At least one Digital Subscriber Line (DSL) or Multiple Virtual Lines (MVL) card**

The chassis requires at least one DSL or MVL card, which is a circuit card that contains four RADSLS or MVL modem ports, an Ethernet interface to the Internet Service Provider (ISP), and a processor/packet forwarder. The processor/packet forwarder controls the modems and forwards the packet traffic via the Ethernet and DSL or MVL interfaces. When the 8600 DSLAM chassis is fully populated, it provides a total of 68 RADSLS or MVL modem ports. When the 8800 DSLAM chassis is fully populated, it provides a total of 72 RADSLS or MVL modem ports.

## Features

The Hotwire DSLAM system contains the following features:

- High speed Internet or intranet access
- RADSLS ports
- MVL ports
- Subscriber authentication and security access and permission features that prevent users from accessing unauthorized services
- Diagnostic tests and performance capabilities
- Primary network management support via SNMP agent for monitoring and traps
- Telnet for configuration and diagnostics

## Levels of Access

There are two levels of diagnostic/administrative access in the Hotwire DSLAM system:

- **Administrator**

The Administrator has complete read/write access to the DSLAM system. With Administrator permission, you can set specific parameters and variables to configure cards, ports, interfaces, VLAN bridging, and endpoint selection.

- **Operator**

The Operator has read-only access and can view configuration information and monitor performance but has no configuration modification permission.

## Software Functionality

Depending upon your system access, you can:

- Configure the system,
- Monitor the system, and/or
- Run applications and diagnostic tests to troubleshoot the network.

## Configuring the DSL Cards

The Hotwire DSLAM software provides DSL configuration options to:

- Configure the DSL cards
- Configure the interfaces and ports
- Set up user accounts
- Upload or download a copy of a card's configuration data to or from a Trivial File Transfer Protocol (TFTP) server
- Download a new version of the DSL and endpoint software

**NOTE:**

You must have Administrator permission to configure the system.

For more information about configuring the system, see Chapter 4, *Configuring the Hotwire DSLAM*, and Chapter 5, *8310 MVL and 8510 DSL Card Configuration*.



## Monitoring the DSL Cards

The Hotwire DSLAM software provides submenu options to monitor the activity of the Hotwire DSL cards. The monitoring screens allow you to:

- List the status of active ports and interfaces in a card, as well as display statistics about other physical layers and interfaces.
- Display network protocol statistics, such as information about an application program assigned to a specific socket number, UDP statistics, TCP data and connection statistics, IP statistics, ICMP packet statistics, and SNMP statistics including SNMP authentication statistics.
- Display bridging information about the Client, ARP, and VLANs.
- Display endpoint information about DSL ports 1 through 4 such as SN type, system name, system contact, and system location. Model and serial number, along with firmware and hardware revisions are also shown.

Use the monitoring screens to help you gather pertinent information and isolate potential problem areas. You can monitor the system with either Administrator or Operator permission.

For more information about monitoring the system, see Chapter 6, *Monitoring the Hotwire DSLAM*.

## Troubleshooting and Diagnostics

The Hotwire DSLAM system provides DSL diagnostic submenu options that:

- Display selftest results for CPU health, memory and ports, and resets.
- Show major alarms such as Selftest Failure, Processor Failure, and DSL or Ethernet port failure.
- Show minor alarms such as Configuration Error or Incorrect SN ports.
- Run a nondisruptive packet echo test over the DSL line.

### **NOTE:**

You must have Administrator permission to perform most of the troubleshooting and diagnostic activities. However, you can run nondisruptive tests as a user with operator permission.

For more information about troubleshooting and diagnostics, see Chapter 7, *Diagnostics and Troubleshooting*.



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# Hotwire Menus and Screens

# 2

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## Overview

The Hotwire DSLAM has a menu- and screen-driven user interface system that enables the user to configure and monitor the Hotwire cards. This chapter contains:

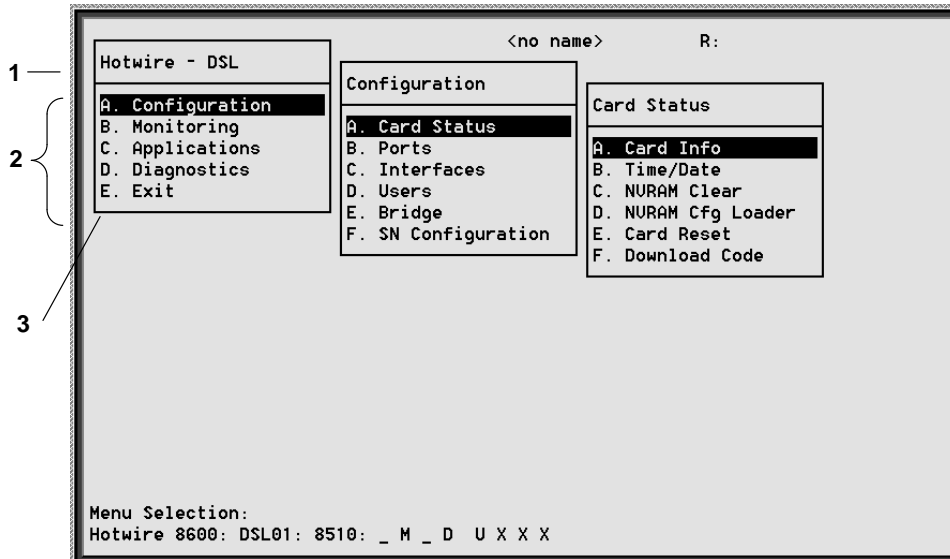
- [Menu and Screen Formats](#)
- [Commonly Used Navigation Keys](#)
- [Hotwire Menu Hierarchy View](#)
- [Logging In to the System](#)
- [Exiting From the System](#)

## Menu and Screen Formats

The Hotwire DSLAM uses an ASCII-based text format for its menus and screens. This section describes the components of a typical Hotwire menu and screen.

### Components of a Hotwire Menu

A typical Hotwire menu format looks like this:



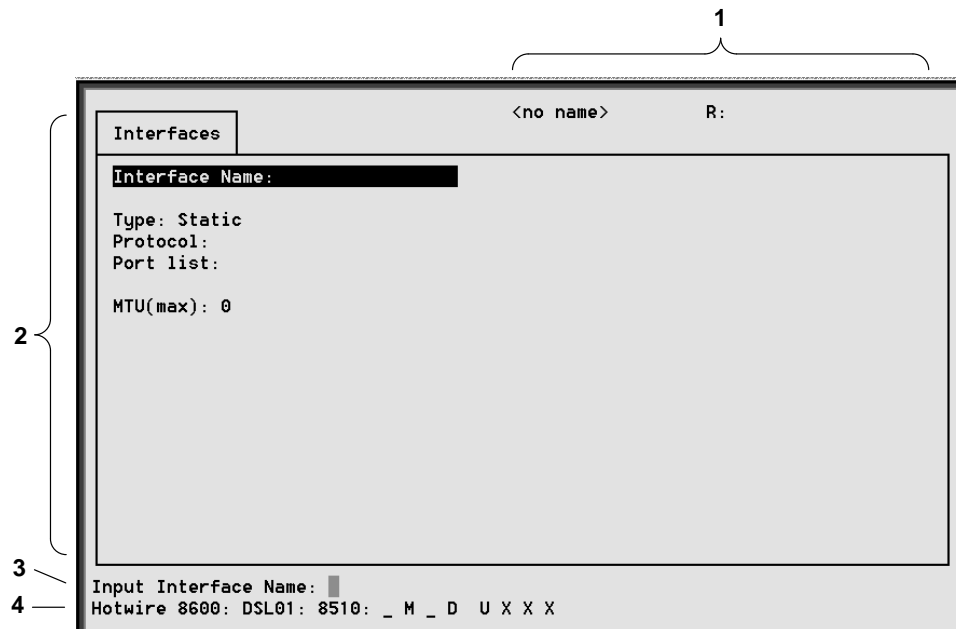
1. **Menu Title** is the top line of the menu window that displays the title of the menu or submenu.
2. **Menu List** is the portion of the menu window that displays the list of menu options. When selected, a menu option displays a submenu window or screen.
3. **Letter Navigation Keys** are provided within a menu list. These keys provide a convenient way (short cut) to select a menu item.

For example, from the Hotwire – DSL menu illustrated above, you can simply press the **A** key to select the Configuration menu item. The Configuration menu appears. You can then press the **A** key to select the Card Status menu item. This action displays the Card Status menu. (You can also use the arrow keys on your keyboard to select a menu item. See *Commonly Used Navigation Keys* on page 2-4 for more information.)

To back up one menu level, press Ctrl-z. To go to the Main Menu, press Ctrl-a, Ctrl-c, Ctrl-t, or Ctrl-y.

## Components of a Hotwire Screen

A typical Hotwire screen looks like this:



1. **System Header Line** is the top line of the screen. This line has two fields that provide system login information.
  - The first field displays the system name or the individual card name. (Access the System Information screen by selecting the appropriate card in the chassis and then follow this menu sequence: *Configuration* → *Card Status* → *Card Info*.) If you do not define the system name, the DSLAM user interface will display `<no name>`.
  - The second field displays the current login. This field displays `R:<user_login>` where `R:` indicates a login and `<user_login>` is the login account of the user currently accessing the system. For example, if a user with a login account called *admin* logs into the system using the local console, this field will display `R:admin`.
2. **Display Area** is the top portion of the screen on which pertinent DSLAM system information is displayed. This is also the portion of the screen on which fields requiring input are displayed. However, you cannot enter values for the fields in this portion of the screen. You must enter field values in the Input Line at the bottom of the screen (see below).
3. **Input Line** is the area of the screen where you are prompted to enter values for the specific field that is highlighted on the screen.
 

For example, in the Interfaces screen above, the Interface Name field is highlighted. If you want to add a new record, you must enter the Interface Name at the **Input Interface Name:** prompt at the bottom of the screen.
4. **Status Line** is the last line on the screen. This line displays status information about the selected card.

For example, in the above illustration, the following line is displayed:

**Hotwire 8600: DSL01: 8510: \_\_ M \_\_ D UXXX**

The first field indicates the chassis type. In this case, the system in use is the Hotwire 8600 DSLAM system. The second field indicates the card selected. In this example, the DSL01 card is selected. The remaining fields indicate card status information, such as whether or not an alarm is present and the status of the Ethernet link. Similar information is displayed on the Card Selection screen. For information about these fields, see *Card Selection Screen* on page 2-10.

## Commonly Used Navigation Keys

The following table lists navigation keys and their definitions. These commands are used to move around the Hotwire DSLAM menus and screens.

Keys	Definition
Ctrl-a	Moves to the top menu
Ctrl-c	Moves to the top of the current menu
Ctrl-k	Moves up to the previous menu selection or entry field
Ctrl-l	Refreshes the screen
Ctrl-n	Moves down or to the next selection
Ctrl-p	Moves back
Ctrl-r	Resets counters (on monitoring statistics displays)
Ctrl-t	Moves to the top menu
Ctrl-u	Clears the current input or prompt line
Ctrl-v	Displays pop-up menus
Ctrl-y	Moves to the top menu
Ctrl-z	Moves back or exits from screen
Up arrow	Moves up to the previous menu selection or entry field
Down arrow	Moves down to the next menu choice or entry field
Enter or Return	Accepts entry
?	Displays the Online help screen

## Hotwire Menu Hierarchy

This section describes the menu structure of the Hotwire user interface.

### Hotwire Chassis Main Menu

The following illustration shows the Hotwire Chassis Main Menu.

<b>Hotwire Chassis</b>
A. Chassis Info
B. Card Selection
C. Logout

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From the Hotwire Chassis Main Menu, you can select:

- **A. Chassis Info** to enter or display chassis information, such as the chassis name, name of person responsible for the system, and physical location of the chassis.  
For more information, see Chapter 3, *Initial Setup Instructions*.
- **B. Card Selection** to select a particular card in the chassis. This screen also displays status information about all cards in the chassis. The card you select determines which Hotwire menu the system will display next (Hotwire – DSL menu).  
For more information, see *Card Selection Screen* on page 2-10.
- **C. Logout** to exit from the current login session on the Hotwire DSLAM.  
For more information, see *Exiting From the System* on page 2-12.

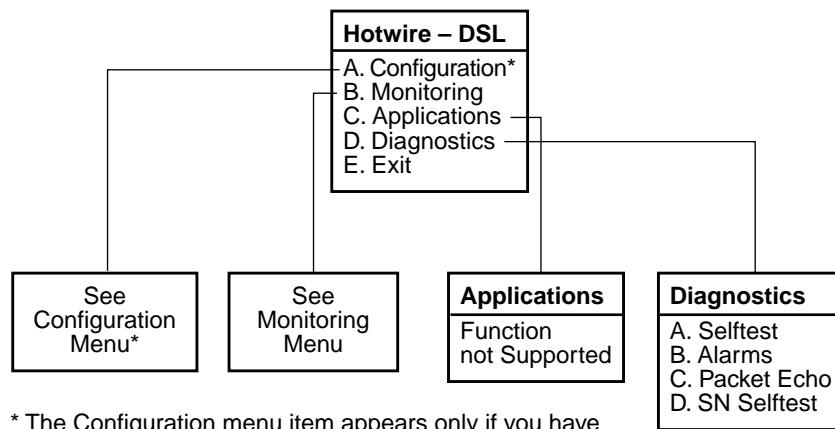
## Hotwire – MCC Menu

After selecting the MCC card from the Card Selection screen, the DSLAM system displays the Hotwire – MCC Menu. From this menu, you can configure, monitor, run applications, and troubleshoot the MCC card.

For information on the MCC card, see *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.

## Hotwire – DSL Menu

After selecting a specific DSL card from the Card Selection screen, the DSLAM system displays the Hotwire – DSL Menu.



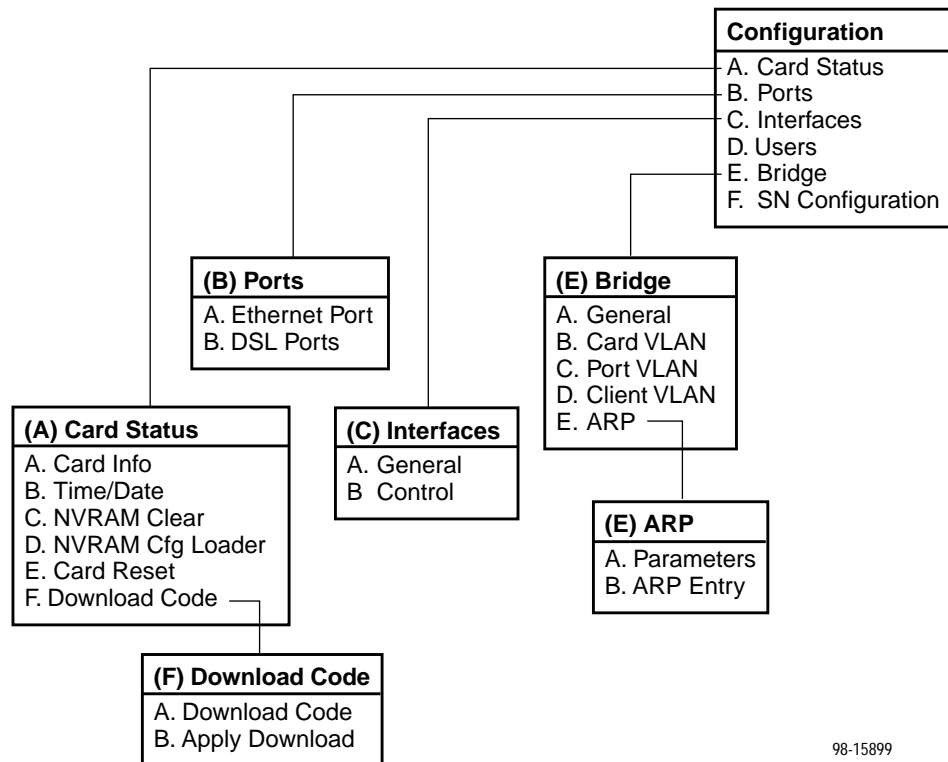
\* The Configuration menu item appears only if you have Administrator permission.

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From this menu, you can configure, monitor, run applications, and troubleshoot a specific DSL card.



The following figure illustrates the complete Configuration menu hierarchy from the Hotwire – DSL menu.

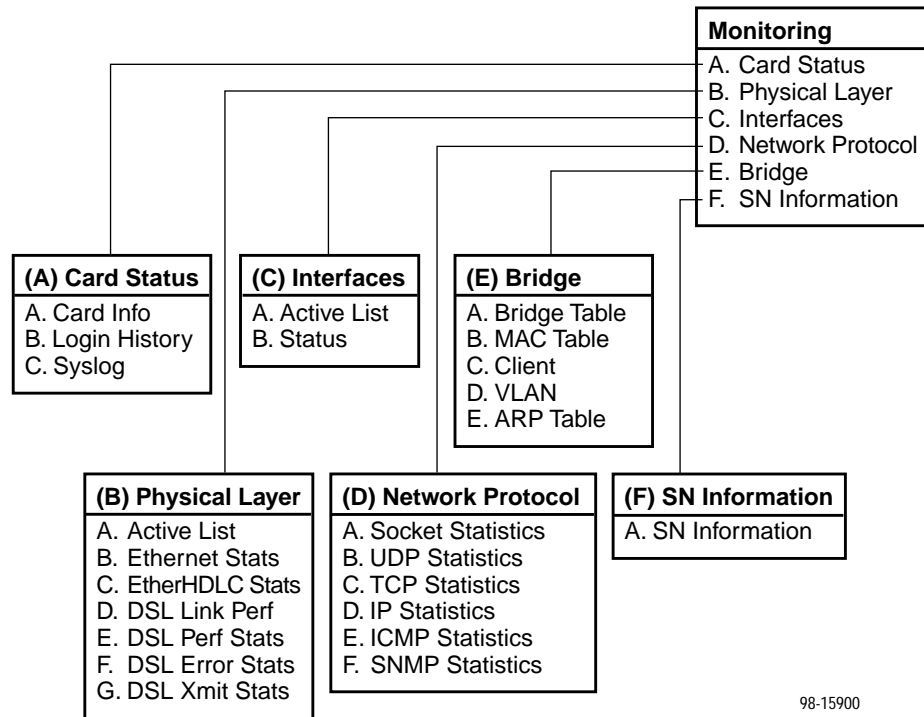


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**NOTE:**

The Configuration menu and its submenus appear only when logging in to the system with a user account that has administrator permission.

The following figure illustrates the complete Monitoring menu hierarchy from the Hotwire – DSL menu.



## Logging In to the System

This section describes how to log in to the Hotwire DSLAM system after the system has been configured for the first time.

### NOTE:

When you power on the system for the first time, the system displays the Who Am I screen. This screen can be accessed only from the local console. For information about this screen, see *Accessing the System for the First Time* in Chapter 3, *Initial Setup Instructions*.

## Reviewing the Levels of Access

There are two levels of privileges on the Hotwire DSLAM system. Your user accounts can be configured with a user name, password, and privilege of:

- Administrator, giving you access to all of the features of the system including configuration options, or
- Operator, giving you read-only access.

The default access is no login and password with administrator status. To provide login security to the DSLAM, user accounts must be configured.

### NOTE:

There must be at least one administrator configured in order to have system security.

For information on configuring user accounts, see the *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.

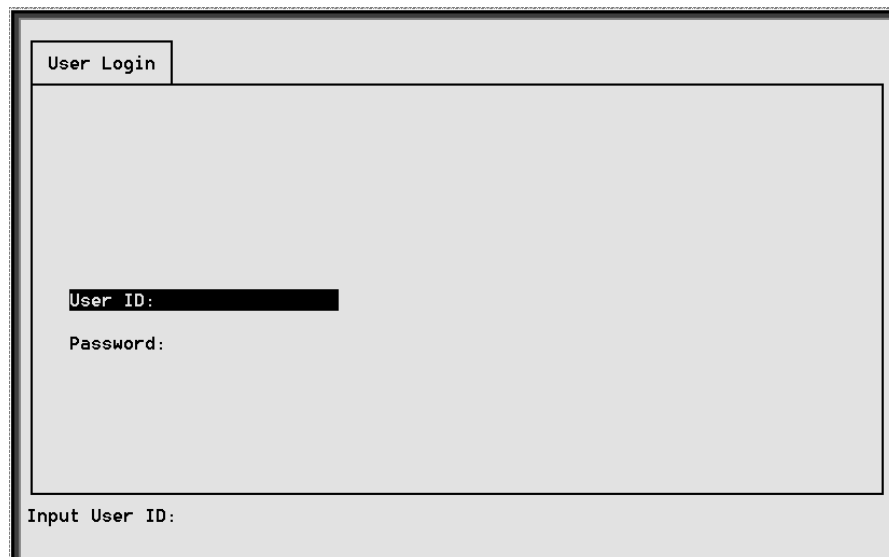
## User Login Screen

You can log in to the Hotwire DSLAM system using either a local VT100-compatible terminal or a remote Telnet connection. However, the Hotwire DSLAM system accepts only one login session at a time.

At the User Login screen, enter your login ID and password.

### NOTE:

The User Login screen only appears if one or more users have been defined.



The screenshot shows a terminal window titled "User Login". Inside the window, there are two input fields: "User ID:" followed by a blacked-out field, and "Password:" followed by a blacked-out field. Below the main window area, the text "Input User ID:" is visible.

**NOTE:**

The login ID and password are case sensitive; that is, the system recognizes both upper- and lower-case letters. For example, if you enter your user name and password information in upper case letters and your assigned user name and password are in upper- and lower-case letters, the system will not let you log in.

After entering your login ID and password, the system displays the Hotwire Chassis Main Menu.

**Card Selection Screen**

From the Hotwire Chassis Main Menu, select Card Selection to display the status of any of the 18 cards present in the chassis by type and slot number. The Card Selection screen also displays general and interface status for each card.

Card Selection						<noname>						L:					
Sl#	Md1#	Stat	Eth	DSL	Lnk	WAN	Lnk	Sl#	Md1#	Stat	Eth	DSL	Lnk	WAN	Lnk		
1:	8510:	_	M	_	D	U	X	X	X								
M:	8000:	_	_	_	U												
Goto Slot(Card) Number: <input type="text"/>																	
Goto Card (M for MCC or slot# for DSL):																	
Hotwire 8600: MCC: 8000: _ _ _ U																	

This display shows the following:

- There is an 8510 card in Slot 1
- Position 1 – no current test ( \_ )
- Position 2 – major alarm is present (M)
- Position 3 – no current test ( \_ )
- Position 4 – Ethernet link is down (D)
- Position 5 – DSL port 1 is up (U)
- Position 6, 7, and 8 – DSL ports 2, 3, and 4 are disabled (X)

On the chassis display, the following information is shown.

Position	Display	Description
	<slot number>	<b>Sl#.</b> M = MCC card; 1–18 = slot number for a DSL card
	<card type>	<b>Mdl#.</b> First four digits of the card model number. RADSL = 8510, MVL card = 8310
1	T (Test mode)	Card currently in test mode
2	M (Major alarm)	Major alarm present on card
3	R (Minor alarm)	Minor alarm present on card
4	e (Ethernet)	Status of Ethernet link (U=UP, D=Down, or X=Disabled)
5	d1 (DSL)*	Status of DSL card Port 1 (U=UP, D=Down, X=Disabled, or H=Handshaking)
6	d2 (DSL)*	Status of DSL card Port 2 (U=UP, D=Down, X=Disabled, or H=Handshaking)
7	d3 (DSL)*	Status of DSL card Port 3 (U=UP, D=Down, X=Disabled, or H=Handshaking)
8	d4 (DSL)*	Status of DSL card Port 4 (U=UP, D=Down, X=Disabled, or H=Handshaking)
9	w1 (WAN)*	Status of WAN link Port 1 (U=Up, D=Down, L=Loopback)
–	w2 (WAN)*	Status of WAN link Port 2 (U=Up, D=Down, L=Loopback)
–	w3 (WAN)*	Status of WAN link Port 3 (U=Up, D=Down, L=Loopback)
–	w4 (WAN)*	Status of WAN link Port 4 (U=Up, D=Down, L=Loopback)
*Not used for MCC cards.		

**NOTE:**

If an alarm, test condition, or other status is not active, an underscore is shown in its place.

Also on this screen, there is a prompt used to select a specific card in the DSLAM chassis. When a DSL slot number is entered, you are connected to the card you selected.

For more information about the status displayed on this screen, such as major and minor alarms, see *Troubleshooting* in Chapter 7, *Diagnostics and Troubleshooting*.

## Accessing the Hotwire – DSL Menu and Selecting a Specific DSL Card

### ► Procedure

To access the Hotwire – DSL menu:

1. From the Hotwire Chassis Main Menu, select Card Selection.  
The Card Selection screen appears.
2. Verify that the DSL card you want to access appears on the Card Selection screen. (See *Card Selection Screen* on page 2-10 for more information.)
3. At the **Goto Card (MCC or DSLnn):** prompt, enter the number of the slot. Then, press Return. For example, if you want to configure the DSL card in Slot 13, enter **13**.  
The Hotwire – DSL menu appears.

## Exiting From the System

You can manually log out of the system or, after five minutes of inactivity, the system will automatically log you out.

### Manually Logging Off

#### ► Procedure

To exit from the Hotwire DSLAM system:

1. Return to the Card Selection screen by selecting Exit from either the Hotwire – MCC menu or the Hotwire – DSL menu.
2. Press Ctrl-z.
3. From the Hotwire Chassis Main Menu, select Logout.  
The system exits from the current login session on the Hotwire DSLAM.

### Automatically Logging Off

The DSLAM system has an automatic timeout feature that logs you out of the system after five minutes of inactivity. You will need to log back in to continue your work.

To log back in, press Return to display the User Login screen and log in.

---

# Initial Setup Instructions

# 3

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## Overview

This chapter provides instructions on how to access the system for the first time and perform initial setup instructions.

**NOTE:**

It is highly recommended that you read the *Hotwire DSLAM for 8310 MVL and 8510 DSL Cards Network Configuration Guide* before you configure the system.

## Accessing the System for the First Time

When you power on the Hotwire DSLAM for the first time, the system displays the Who Am I screen on the console terminal. On this screen, you must set the management IP address and subnet mask for the MCC card. Follow the instructions in the following section, *Setting the Management IP Address and Subnet Mask on the MCC*.

## Setting the Management IP Address and Subnet Mask on the MCC

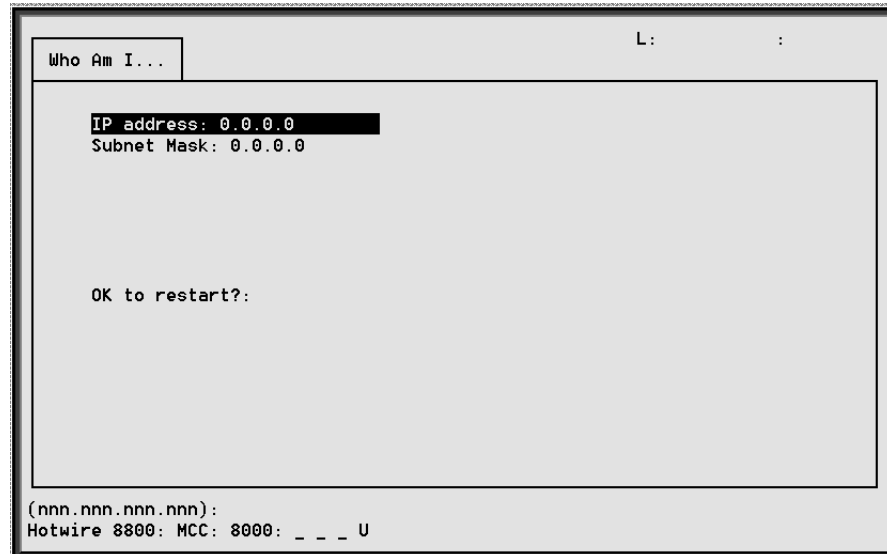
After powering on the system for the first time, set the management IP address and subnet mask of the MCC card. This is a mandatory step and must be completed before proceeding to Chapter 4, *Configuring the Hotwire DSLAM*.

**► Procedure**

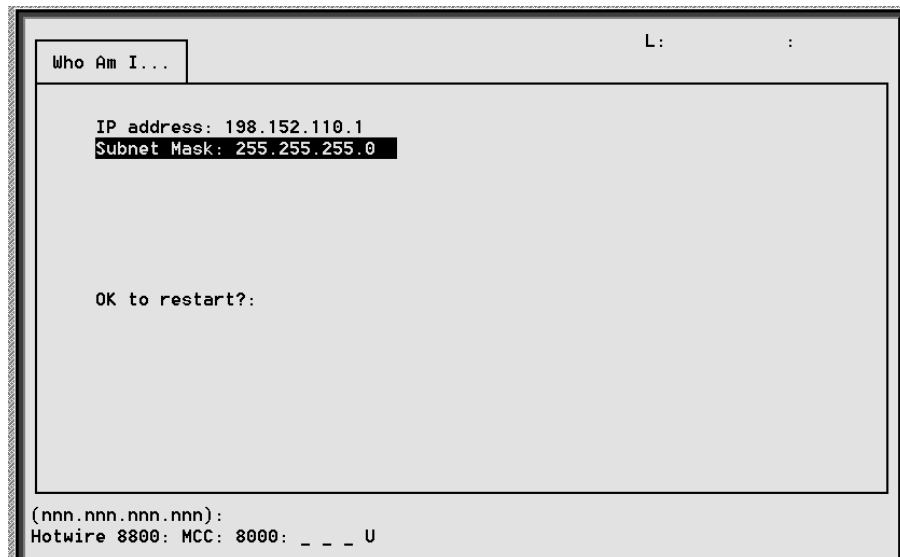
To set the management IP address and subnet mask from the console terminal:

1. Power up the chassis.

After the self-test completes, the Who Am I screen appears.



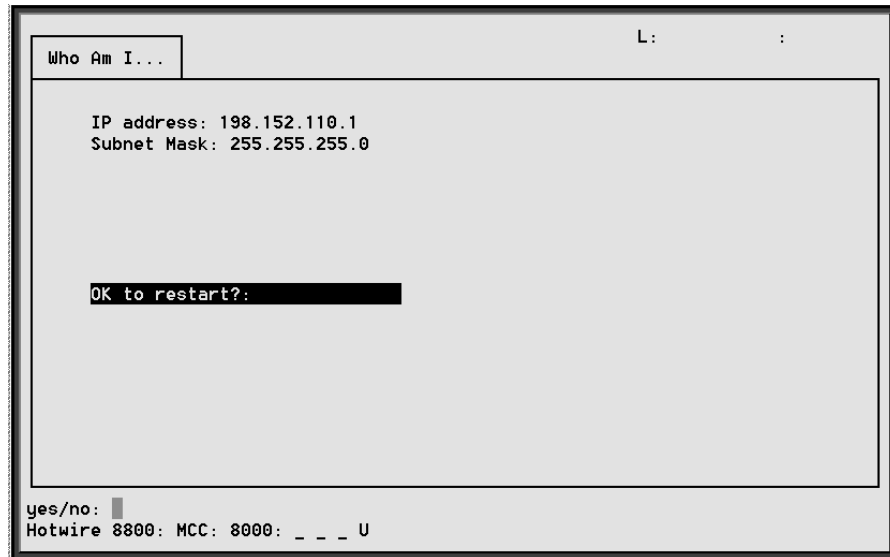
2. From the Who Am I screen, enter the management domain IP address of the MCC card and press Return. For example, if the IP address of the MCC card is **198.152.110.1**, type this value at the (nnn.nnn.nnn.nnn): prompt on the Input Line at the bottom of the screen.



The system automatically calculates the subnet mask based on the IP address you enter.



3. Do one of the following at the ( `nnn.nnn.nnn.nnn` ) : prompt:
  - To accept the subnet mask, press Return or,
  - To enter a different subnet mask, enter a new subnet mask and press Return.



The system highlights the `OK to restart?` prompt.

4. Type **y** at the **yes/no**: prompt to restart the card or **n** to decline the restart. If you type **y**, the card restarts. The system displays the Hotwire Chassis Main Menu.

**NOTE:**

At this point, the MCC card can accept a Telnet session for remote configuration.

If an MCC powers up with no router ID (for new cards or after a clear NVRAM command has been executed), the MCC will perform a BOOTP out the Ethernet interface to acquire an IP address and subnet mask. This IP address and subnet mask is kept in non-volatile storage if you want to enter or override this information on either the Who Am I screen or the MCC Ethernet IP Address screen.

## Additional Setup Instructions

This section describes additional setup instructions you should perform. On the Chassis Information screen, you can enter pertinent chassis information, such as the chassis name, name of the person responsible for the system, and the physical location of the chassis.

## Chassis Information Screen

### ► Procedure

To enter or display chassis configuration information:

1. Choose Chassis Info from the Hotwire Chassis Main Menu. The following table describes the information you should enter on the Chassis Information screen.

Field	Input	Description
Chassis Name	16 alphanumeric characters	Name for the equipment
Chassis Contact	32 alphanumeric characters	Name and phone number of individual responsible for the equipment
Chassis Location	16 alphanumeric characters	Physical location of the equipment
Bay Number	16 alphanumeric characters	Floor and/or bay number of the equipment
Chassis Number	16 alphanumeric characters	Chassis serial number (located on the lower right side of chassis)

2. When you have made the appropriate changes to the screen, a message **Configuration has been modified. Save (yes/no)?** appears. Enter **yes** to save changes and press Return to go back to the Hotwire Chassis Main Menu.

## What's Next?

Now you are ready to configure your Hotwire DSLAM. Refer to Chapter 4, *Configuring the Hotwire DSLAM*, for instructions on how to configure the mandatory minimum configurations and Chapter 5, *8310 MVL and 8510 DSL Card Configuration*, for additional configuration instructions when customizing your application.

After you have configured your system, you can monitor and troubleshoot potential problems on the system. Refer to Chapter 6, *Monitoring the Hotwire DSLAM*, and Chapter 7, *Diagnostics and Troubleshooting*, for more information.

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# Configuring the Hotwire DSLAM

# 4

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## Overview

The Hotwire DSLAM enables you to configure and manage the Hotwire MCC and DSL cards. This chapter describes the basic card configuration instructions.

## Configuring the MCC Card and DSL Cards

Use the procedures **in the following order** to configure the MCC card and DSL cards for the basic setup for terminal management and user data connectivity. For detailed information on these instructions, see Chapter 5, *8310 MVL and 8510 DSL Card Configuration*.

### **NOTE:**

For more information about MCC and DSL card configuration and management, consult the *Hotwire DSLAM for 8310 MVL and 8510 DSL Cards Network Configuration Guide*.

The following tables list the basic steps you need to configure the MCC card and the DSL and MVL cards.

<b>For the Management Domain, perform task . . .</b>	<b>On the . . .</b>	<b>See . . .</b>
1. Clear NVRAM if the Who Am I screen does not appear.	MCC Card	<i>Clear NVRAM</i> , page 4-3.
2. Set the IP address and Subnet Mask.	MCC Card	<i>Setting the IP Address and Subnet Mask</i> , page 4-3.
3. Configure time and date.	MCC Card	<i>Setting Time and Date</i> , page 4-4.
4. Create SNMP Community Strings and Authentication Failure Trap.	MCC Card	<i>Creating SNMP Community Strings and Enabling Authentication Failure Traps</i> , page 4-5.
5. Create default route.	MCC Card	<i>Creating the Default Route</i> , page 4-5.

<b>For each Access Node, perform task . . .</b>	<b>On the . . .</b>	<b>See . . .</b>
1. Configure VLAN(s) on DSL or MVL cards.	DSL or MVL Card	<i>Configuring VLAN(s) on a DSL or MVL Card</i> , page 4-6.
2. Select the Active VLAN on each DSL or MVL port.	DSL or MVL Card	<i>Selecting the Active VLAN on each DSL or MVL Port</i> , page 4-6.
3. Configure a default next hop router for each VLAN.	DSL or MVL Card	<i>Configuring the Next Hop Router for each VLAN</i> , page 4-7.
4. Configure static users.	DSL or MVL Card	<i>Configuring Static Users</i> , page 4-7.

## Clear NVRAM

Prior to configuring your system, you should clear NVRAM on the MCC and DSL cards if the Who Am I screen is not displayed on system power up.

### ► Procedure

1. Select *Configuration* → *Card Status* → *NVRAM Clear (A-A-D)*.
2. Enter yes at the **Type 'yes' to proceed or ^z to exit this screen** prompt.

#### **NOTE:**

An answer of yes causes the loss of all static configuration information, and the system resets automatically. Any changed parameters will return to default values, including user accounts, filtering information, interface configurations, and port configurations.

## Setting the IP Address and Subnet Mask

After powering on the system for the first time, you must set the management IP address and subnet mask of the MCC card. (Also see *Setting the Management IP Address and Subnet Mask on the MCC* in Chapter 3, *Initial Setup Instructions*.)

### ► Procedure

To set the management IP address and subnet mask of the MCC card:

1. Power up the chassis.  
When the self-test is complete, the Who Am I screen appears.
2. Enter the management domain IP address at the **(nnn.nnn.nnn.nnn):** prompt.  
The subnet mask is automatically calculated.
3. Do **one** of the following at the **(nnn.nnn.nnn.nnn) :** prompt:
  - Press Return to accept the subnet mask, or
  - Enter a new subnet mask and press Return.The system highlights the **OK to Restart?:** prompt.
4. Enter **y** at the **yes/no:** prompt to restart the card or **n** to decline the restart.  
The system displays the Hotwire Chassis Main Menu.

## Setting Time and Date

When you select Time/Date from the Card Status menu, the Time/Date screen is displayed. From this screen, you can configure the local time and date on the card.

### ► Procedure

To set the time and date on the MCC card:

1. Select **B. Card Selection** from the Hotwire Chassis Main Menu.
2. Enter **MCC** or **M** at the **Goto Card (MCC or slot # for DSL):** prompt.
3. Select *Configuration → Card Status → Time/Date (A-A-C)*.
4. Enter the current local time and date at the **Enter time in hh:mm [am|pm] format:** prompt.
5. Enter the current date at the **Enter today's date in mm/dd/yy or dd-mm-yy format:** prompt.
6. Enter **Broadcast** or **Unicast** at the **Action (Broadcast/Unicast):** prompt.
7. Enter the IP address of the Simple Network Time Protocol (SNTP) server at the **(nnn.nnn.nnn.nnn):** prompt.

#### **NOTE:**

While this field is optional, it is recommended that a value be entered to ensure the time of the DSLAM stays in synch with "real time." The SNTP server maintains a sense of common time among Internet hosts.

8. Enter the number of hours between synchronization (**1 – 24**) at the **Input Number:** prompt (default = 1).
9. Press Ctrl-z and save the changes.

#### **NOTE:**

At system boot time, the time on the DSL card automatically synchronizes with the MCC card. Therefore, it is usually not necessary to use this screen on the DSL card. If there is active DHCP-lease derived information on the card, changing the local time is not recommended.

## Creating SNMP Community Strings and Enabling Authentication Failure Traps

### ► Procedure

To configure SNMP community strings and enable the Authentication Failure trap mechanism:

1. From the MCC Main Menu, select *Configuration* → *SNMP* → *Communities/Traps (A-F-B)*.
2. If desired, enable the Authentication Trap Failure. You want to enable this field to send a trap when an SNMP request community string does not match or when the password for a Telnet session is incorrect.
3. Enter access permission at the **ReadOnly(ro)/ReadWrite(rw)/NoAccess(na):** prompt.
4. Type the IP address or addresses of the NMS manager(s) in *nnn.nnn.nnn.nnn* format at the **IP Address (nnn.nnn.nnn.nnn) or space to delete:** prompt.
5. Enter the port number at the **Input Number:** prompt (default = 162).
6. Enable the IP address and port to send traps to this address at the **Enable/Disable:** prompt.
7. Press Ctrl-z and save the changes.

For additional information on this screen, see Chapter 4, *SNMP Menu*, in the *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.

## Creating the Default Route

Use this procedure to create the default route to the management domain next hop router. This default route will be used to forward management domain traffic from the MCC card.

### ► Procedure

To create the default route to direct management domain traffic to the MCC card:

1. Select *Configuration* → *IP Router* → *Static Routes (A-E-A)*.
2. Enter **0** or press Return at the **Item Number** prompt.
3. Enter **0.0.0.0** at the **Destination (or space to delete route):** prompt.
4. Press Return at the **Subnet Mask: (nnn.nnn.nnn.nnn)** prompt.
5. Type the IP address of the default route to the next hop address at the **Next Hop IP Address (nnn.nnn.nnn.nnn)** prompt.
6. Type **1** for preference at the **Input Number** prompt.
7. Leave default fields for *s/D* (Source/Destination) and *PA* (Proxy ARP) fields.
8. Press Ctrl-z and save the changes.

## Configuring VLAN(s) on a DSL or MVL Card

### ► Procedure

To configure at least one VLAN ID for this DSL or MVL card:

1. Select *Configuration* → *Bridge* → *Card VLAN (A-E-B)*.
2. Enter **0** or press Return at the **Item Number (0 to add new record):** prompt.
3. Enter the VLAN ID at the **Enter VLAN ID between 1 and 4094 or space to delete:** prompt.
4. Enter **enabled** at the **Enabled/Disabled:** prompt in the Mux Fwd field. (Default = enabled.)
5. Enter **disabled** at the **Enabled/Disabled:** prompt in the IP Filter field. (Default = disabled.)
6. Enter **enabled** at the **Enabled/Disabled:** prompt in the IP Scoping field. (Default = enabled.)
7. If desired, enter a domain name at the **Domain Name:** prompt.
8. Enter **yes** at the **yes/no:** prompt to save your changes.

#### **NOTE:**

For more information about the fields listed above, see Chapter 3, *Service Domain*, in the *Hotwire DSLAM for 8310 MVL and 8510 DSL Cards Network Configuration Guide*.

## Configuring the Active VLAN on each DSL or MVL Port

### ► Procedure

To configure the active VLAN on each DSL or MVL port:

#### **NOTE:**

You can configure only one active VLAN per port, but normally you assign the same Next Hop Router.

1. Select *Configuration* → *Bridge* → *Port VLAN (A-E-C)*.
2. Enter the port number at the **DSL Port #:** prompt.
3. Enter **a** to activate at the **Action(Edit/Activate/Deactivate):** prompt.
4. Enter the number of the VLAN to be assigned to this port at the **Input Number:** prompt. If you want a VLAN that spans several DSL or MVL cards, you must specify the same VLAN number across all cards.
5. Press Ctrl-z and save the changes.



## Configuring the Next Hop Router for each VLAN

### ► Procedure

To configure the default next hop router for each VLAN:

1. Select *Configuration* → *Bridge* → *Port VLAN (A-E-C)*.
2. Enter the port number at the **DSL Port #:** prompt.
3. Enter **e** to edit at the **Action(Edit/Activate/Deactivate):** prompt.
4. Enter the IP address of the default next hop router for this VLAN at the **Enter IP address of default next hop router (nnn.nnn.nnn.nnn):** prompt.
5. Press Ctrl-z and save the changes.

## Configuring Static Users

### ► Procedure

To configure static users to get their peer address from DHCP:

1. Select *Configuration* → *Bridge* → *Client VLAN (A-E-D)*.
2. Enter the port number at the **DSL Port #:** prompt.
3. Enter **0** or press Return at the **Input Number:** prompt.
4. Enter the IP Address of this user at the **Enter Client IP address (nnn.nnn.nnn.nnn):** prompt.
5. Enter the IP address of the default next hop router for this client at the **Enter IP address of default next hop router (nnn.nnn.nnn.nnn):** prompt.
6. Enter the VLAN for this user at the **Input VLAN ID:** prompt.
7. Enter **yes** at the **yes/no:** prompt to save your changes.

#### **NOTE:**

For information on configuring dynamic users, see Chapter 3, *Service Domain*, in the *Hotwire DSLAM for 8310 MVL and 8510 DSL Cards Network Configuration Guide*.



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# 8310 MVL and 8510 DSL Card Configuration

# 5

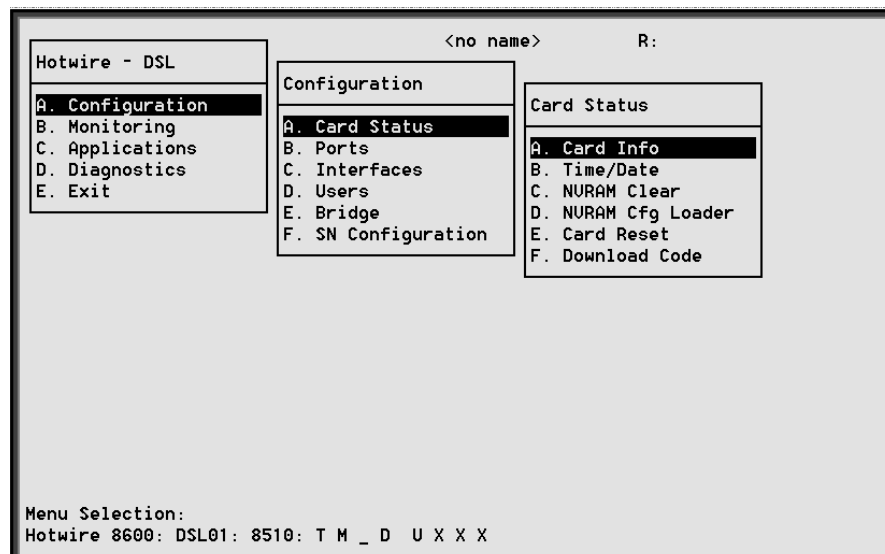
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## Overview

This chapter describes configuration options on the DSL card. Use these options to customize your applications. For information on customizing the MCC card, see *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.

## DSL Configuration Card Status Screens

Use the system information submenu of the Card Status screens to configure basic DSL card-level information.



**NOTE:**

Only a user who logs on to the Hotwire DSLAM with Administrative permission can configure the DSL card.

**► Procedure**

To configure card information, time/date, clear NVRAM, upload or download configuration sets, download new firmware, or reset card:

1. Follow this menu sequence:

*Configuration* → *Card Status (A-A)*

2. The Card Status menu appears. Enter the desired value on each selected screen and field as shown in Table 5-1 and press Return.

**Table 5-1. Card Status Options (1 of 3)**

<b>Card Info (Card Information)</b>	<b>A-A-A</b>
Gives the user the ability to configure basic card-level information.	
<b>Card Name</b> – 16 alphanumeric characters. Name assigned to the card.	
<b>Card Contact</b> – 32 alphanumeric characters. Name or number of party responsible for card.	
<b>Card Location</b> – 16 alphanumeric characters. Location assigned to the card.	
<b>Local Control Terminal Port Mode</b> – Standard/Extended (Default = Standard). Standard is for USA keyboards; Extended is for European keyboards.	
<b>Remote Control Terminal Port Mode</b> – Standard/Extended (Default = Standard). Standard is for USA keyboards; Extended is for European keyboards.	
<b>Telnet daemon tcp port</b> – 0–65536 (Default = 23). If you change this field, you need to do a card reset.	
<b>Time/Date</b>	<b>A-A-B</b>
Gives the user the ability to configure the local time and date on the DSL card.	
<b>Local Time/Date</b> – Enter the time in <i>hh.mm</i> format (am or pm). Enter the date in <i>mm/dd/yy</i> format.	
NOTE: At system boot time, the time on the DSL cards automatically synchronizes with the MCC card.	
<b>NVRAM Clear</b>	<b>A-A-C</b>
Gives the user the ability to clear out the Non-Volatile RAM (NVRAM) in order to reuse the card or to reconfigure the current card.	
CAUTION: If you select yes on this screen, you will permanently remove most of the configuration information you have stored on this card. The system will perform a reset and return to the factory configuration.	

Table 5-1. Card Status Options (2 of 3)

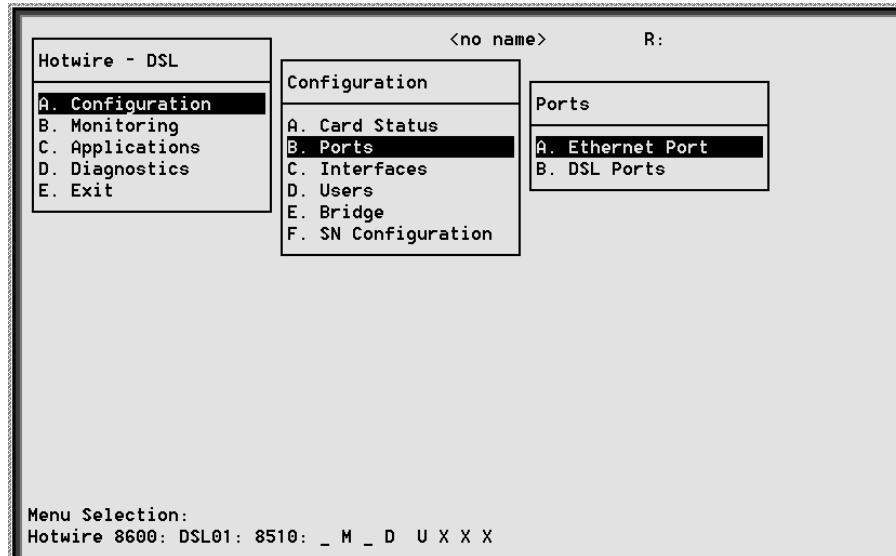
NVRAM Cfg Loader	A-A-D
<p>Gives the user the ability to upload or download a copy of the card's binary configuration data to or from a Trivial File Transfer Protocol (TFTP) server.</p> <p><b>Configuration File Name</b> –The file name may be a regular path name expression of directory names separated by a forward slash (/) ending with the file name. The total path name length must be less than 40 characters. If the TFTP server is hosted by a DOS machine, then directory and file names must follow the 8.3 naming convention imposed by DOS.</p> <p><b>DOS Machine</b></p> <p>If your server is hosted by a DOS machine, you must name the file to be uploaded using the DOS convention 8-character length. The system will automatically upload the configuration file and create directories and file names as needed.</p> <p><b>UNIX Machine</b></p> <p>If your server is hosted by a UNIX machine, the configuration file you name <b>will not</b> be created on the UNIX system by the TFTP server. It is <b>critical</b> that you work with your system administrator to plan the naming conventions for directories, filenames, and permissions so that anyone using the system has read and write permissions. (This is a UNIX system security feature.)</p> <p>NOTE: This must be done before you can upload files to a UNIX server.</p> <p><b>TFTP Server IP Address</b> – Address in <i>nnn.nnn.nnn.nnn</i> format. This address must be in the management domain.</p> <p><b>TFTP Transfer Direction</b> – Upload-to-Server/Download-to-Server (Default = Upload-to-Server). Select Upload-to-Server to store a copy of the card's configuration on the server. Select Download-to-Server to have the file server send a copy of the stored configuration file to the card.</p> <p><b>Start Transfer</b> – Yes/No (Default = No).</p> <p><b>Packets Sent</b> – Number of packets sent in download.</p> <p><b>Packets Received</b> – Number of packets received in download.</p> <p><b>Bytes Sent</b> – Number of bytes sent in download.</p> <p><b>Bytes Received</b> – Number of bytes received in download.</p> <p><b>Transfer Status</b> – Status of the upload or download transfer.</p> <p>NOTE: After a download, the card must be reset for the new configuration to take effect.</p>	
Card Reset	A-A-E
<p>Gives the user the ability to reset the card. This resets all counters and if a new configuration or software version has been downloaded, the new code will then become active.</p> <p>NOTE: This action disrupts the data flow for at least 30 seconds.</p>	
Download Code (Download Code and Apply Download)	A-A-F
<p>Gives the user the ability to download a new version of code and apply the downloaded code. For further information on this feature, see Appendix A, <i>Download Code and Apply Download</i>.</p>	

**Table 5-1. Card Status Options (3 of 3)**

<b>Download Code</b>	<b>A</b>
<p>This screen is similar to the NVRAM Config Loader screen.</p> <p><b>Image File Name</b> – The file name may be a regular pathname expression of directory names separated by a forward slash (/) ending with the file name. The total pathname length must be less than 40 characters. If the TFTP server is hosted by a DOS machine, then directory and file names must follow the 8.3 naming convention imposed by DOS.</p> <p><b>TFTP Server IP Address</b> – Address in <i>nnn.nnn.nnn.nnn</i> format. This address must be in the management domain.</p> <p><b>Start Transfer</b> – Yes/No (Default = No).</p> <p><b>Packets Sent</b> – Number of packets sent in download.</p> <p><b>Packets Received</b> – Number of packets received in download.</p> <p><b>Bytes Sent</b> – Number of bytes sent in download.</p> <p><b>Bytes Received</b> – Number of bytes received in download.</p> <p><b>Transfer Status</b> – Status of the download transfer.</p> <p>Once the download is complete, press Ctrl-z to exit back to the Download Code submenu and select Apply Download.</p>	
<b>Apply Download</b>	<b>B</b>
<p>This selection applies the downloaded code and drops all connections by performing a device reset. This screen is used to overlay the previously downloaded image for the card. If you select yes at the Reset System prompt, the system goes through a system restart and interrupts service on the card. For further information on this feature, see Appendix A, <i>Download Code and Apply Download</i>.</p> <p><b>NOTE:</b> If you have not previously downloaded code, then you will not be able to access this selection.</p>	

## DSL Configuration Ports Screens

Use the system information submenu of the Ports screens to display the DSL Ports screen.



### ► Procedure

To configure ports:

1. Follow this menu sequence:  
*Configuration* → *Ports (A-B)*
2. The Ports menu appears. Enter the desired value on each selected screen and field as shown in Table 5-2 and press Return.

**Table 5-2. Ports Options (1 of 3)**

<b>Ethernet Port</b>	<b>A-B-A</b>
Gives the user the ability to select full or half duplex on the Ethernet Port.	
<b>Port Name</b> – Enter the port name (up to 7 characters).	
<b>Full Duplex</b> – Enable/Disable (Default = Disable).	
<b>Function</b> – Edit/Reset. Select Reset to have changes become active.	

**Table 5-2. Ports Options (2 of 3)**

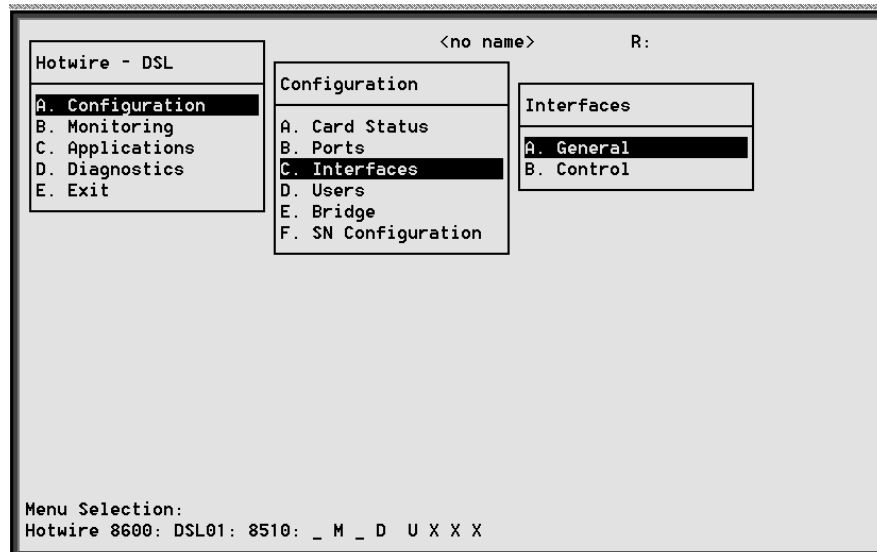
<b>DSL Ports (DSL Parameters) 8510 Card</b>	<b>A-B-B</b>
<p>Gives the user the ability to configure the operational and alarm parameters of the DSL ports on the 8510 card. Each DSL port is configured separately.</p>	
<p><b>Action</b> – Edit/Reset. Edit to configure the DSL ports, Reset to reset the port and make changes active.</p>	
<p><b>Port #</b> – Enter port 1 to 4 (Default = 0).</p>	
<p><b>Tx Power</b> – 0 dB, –3 dB, –6 dB. Enter the rate that allows you to reduce the transmit power by: –3 dB or –6 dB (Default = 0 dB). Short loops require less power, reducing crosstalk and giving better performance on longer loops in the same cable bundle.</p>	
<p><b>SN Tx Power</b> – 0 dB, –3 dB, –6 dB, –9dB. (Default = –6 dB)</p>	
<p><b>Startup Margin</b> – The Startup Margin (SM) field is used to determine the quality of the connection of the upstream link on system startup. It is used in conjunction with the adaptive speed fields to determine the initial line speeds of the DSL link. The value is between –3 and 9. In Adaptive Mode, if the margin falls below SM, the DSL link will be restarted at a slower speed. If the calculated margin of the next speed is greater than SM by 3 dB, the speed will increase. Enter –3 to 9 (Default = 3).</p>	
<p><b>Behavior</b> – Fixed/Adaptive (Default = Adaptive). In fixed rate mode, the DSL port will operate at the specified upstream and downstream speed. In rate adaptive mode, the rates will not exceed the maximum speed and traps are sent when the links drop below the minimum, as the transmission characteristics of the loop change.</p>	
<p><b>SN Type</b> – Model number of endpoint. For Model 8510 DSL Card, SN type is 5620. (This field is read-only.)</p>	
<p><b>Fixed: Down Speed*</b> – 7168/6272/5120/4480/3200/2688/2560/2240/1920/1600/1280/1024/960/896/768/640/512/384/256. (Default = 2560 kbps).</p>	
<p><b>Fixed: Up Speed</b> – 1088/952/816/680/544/408/272/91 (Default = 1088 kbps). Enter the fixed upstream speed.</p>	
<p><b>Adaptive: Max Dn Speed*</b> – 7168/6272/5120/4480/3200/2688/2560/2240/1920/1600/1280/1024/960/896/768/640/512/384/256. (Default = 7168 kbps).</p>	
<p><b>Adaptive: Min Dn Speed*</b> – 7168/6272/5120/4480/3200/2688/2560/2240/1920/1600/1280/1024/960/896/768/640/512/384/256. (Default = 640 kbps).</p>	
<p><b>Adaptive: Max Up Speed*</b> – 1088/952/816/680/544/408/272/91 (Default = 1088 kbps). Enter the maximum upstream speed.</p>	
<p><b>Adaptive: Min Up Speed</b> – 1088/952/816/680/544/408/272/91 (Default = 408 kbps). Enter the minimum upstream speed.</p>	
<p><b>Margin Threshold:</b> – Sends a trap message if the margin on either end falls below a selected value. Enter a value for the margin threshold trap (–5 dB to +10 dB) (Default = +3). Enter D to disable trap.</p>	
<p><b>Link Down Ct:</b> – Sends a trap message if the number of DSL link down events in 15 minutes exceeds the selected value. Enter a value for the Link Down Count Trap (0 to 1000). Enter D to disable trap.</p>	
<p><b>NOTE:</b> If you have made changes to this screen, select Reset in the Action field to make the changes active.</p>	
<p>* If you select a downstream speed of 2688 or higher, your upstream speed selection is limited to 1088/952/680/408.</p>	



Table 5-2. Ports Options (3 of 3)

DSL Ports (DSL Parameters) 8310 Card	A-B-B
<p>Gives the user the ability to configure the operational and alarm parameters of the DSL ports on the 8310 card. Each DSL port is configured separately.</p> <p><b>Action</b> – Edit/Reset. Edit to configure the DSL ports, Reset to reset the port and make changes active.</p> <p><b>Port #</b> – Enter port 1 to 4. (Default = 0)</p> <p><b>Behavior</b> – Adaptive. In rate adaptive mode, the rates will vary between the minimum and maximum speeds as the transmission characteristics of the loop change.</p> <p><b>Max Speed</b> – 768/704/640/576/512/448/384/320/256/192/128 (Default = 768).</p> <p><b>SN Type</b> – Model number of endpoint. For Model 8310 MVL Card, SN type is 6310. (This field is read-only.)</p> <p><b>Margin Threshold:</b> – Sends a trap message if the margin on either end falls below a selected value. Enter a value for the margin threshold trap (–5 dB to +10 dB) (Default = +3). Enter D to disable trap.</p> <p><b>Link Down Ct:</b> – Sends a trap message if the number of DSL link down events in 15 minutes exceeds the selected value. Enter a value for the Link Down Count Trap (0 to 1000). Enter D to disable trap.</p> <p><b>NOTE:</b> If you have made changes to this screen, select Reset in the Action field to make the changes active.</p>	

## DSL Configuration Interfaces Screens



Use the system information submenu of the Interfaces screens to configure basic interface information.

## ► Procedure

To view DSL card information and configure Maximum Transmission Unit (MTU) settings or restart, stop, or monitor an interface:

1. Follow this menu sequence:

*Configuration* → *Interfaces (A-C)*

2. The Interfaces menu appears. Enter the desired value on each selected screen and field as shown in Table 5-3 and press Return.

**Table 5-3. Interfaces Options**

<b>General (General Interfaces)</b>	<b>A-C-A</b>
<p>Gives the user the ability to view basic card interface information about a given interface.</p> <p><b>Interface Name</b> – 3 characters. e1a = Ethernet port; s1c, s1d, s1e and s1f = DSL or MVL interface.</p> <p><b>Type</b> – Static/Dynamic. Interface type.</p> <p><b>Protocol</b> – HDLC or Ethernet. Interface protocol.</p> <p><b>Port List</b> – Ports available on the card.</p> <p><b>MTU (max)</b> – 64–1600 bytes (Default = 1536).</p> <p style="padding-left: 40px;">NOTE: The above MTU values are the only values you may enter. Make certain that if you change from the default value, the new numbers are appropriate to your network. Do a card reset or reset the Ethernet interface.</p>	
<b>Control (Control Interfaces)</b>	<b>A-C-B</b>
<p>Gives the user the ability to start, stop, and monitor (up, down, or testing) the current state of an interface.</p> <p style="padding-left: 40px;">NOTE: Stopping the interface disables all of the traffic on that port, including diagnostics. If you want to only disable customer traffic, instead disable all VLANs on that port.</p> <p>There are no user-configurable elements on this screen except for the ability to start and stop the interface. Valid choices for the DSL card are e1a, s1c, s1d, s1e, and s1f.</p>	

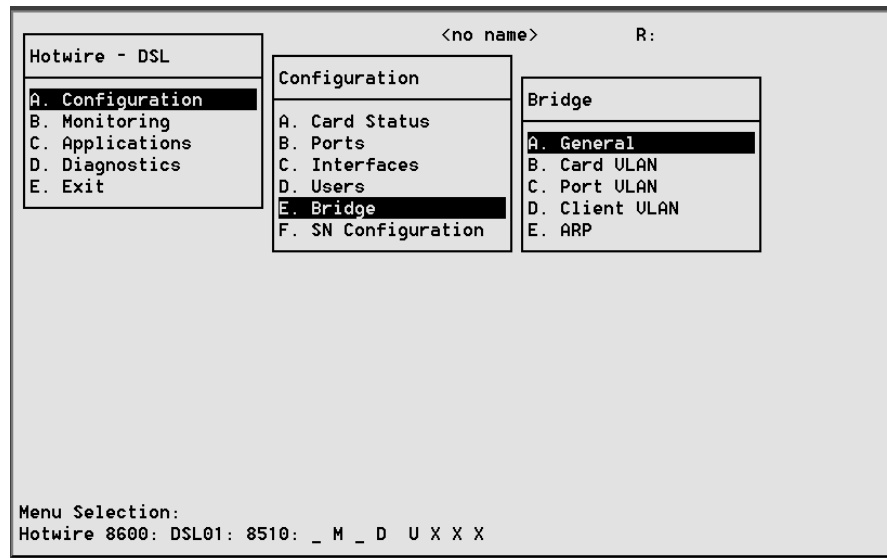
## DSL Configuration Users Screens

Use the system information submenu of the Users screens to configure login accounts for Telnet sessions directly to the DSL cards.

**This menu item is not currently supported on this card.**

## DSL Configuration Bridge Screens

Use the system information submenu of the Bridge screens to configure bridging information.



### ► Procedure

1. Follow this menu sequence:  
*Configuration* → *Bridge (A-E)*
2. The Bridge menu appears. Enter the desired value on each selected screen and field as shown in Table 5-4 and press Return.

**Table 5-4. Bridge Options (1 of 2)**

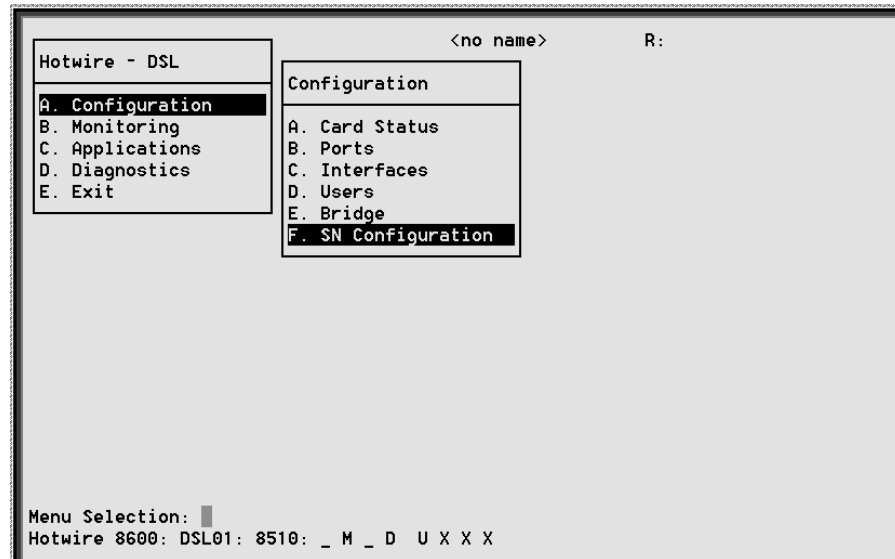
<b>General</b>	<b>A-E-A</b>
<p>Gives the user the ability to configure bridge aging timeouts for MAC entries on the bridge and general bridge parameters.</p> <p>There are no user configurable elements on this screen except for the ability to set the bridge aging timeout.</p> <p><b>Timeout</b> – Enter the bridge aging timeout (10–1,000,000 seconds) (Default = 300).</p>	
<b>Card VLAN (Card)</b>	<b>A-E-B</b>
<p>Gives the user the ability to configure VLANs for the entire card. There are a maximum of 16 entries per card</p> <p><b>Item</b> – Enter 0 (zero) to add a new record.</p> <p><b>VLAN</b> – Enter a VLAN ID between 2 and 4094 (Default = Null). There must be an entry in this field.</p> <p><b>Mux Fwd</b> – Enable/Disable (Default = Enable). There must be an entry in this field.</p> <ul style="list-style-type: none"> <li>■ When Mux Fwd is enabled, all upstream traffic is sent out the 10BaseT interface. Forwarding restrictions are set by the other parameters on the screen.</li> <li>■ When Mux Fwd is disabled, the DSLAM forwards traffic based on a destination MAC address.</li> </ul> <p>Either enabled or disabled, traffic is forwarded on ports having the same VLAN designation.</p> <p><b>IP Filter</b> – Enable/Disable (Default = Disable). There must be an entry in this field.</p> <ul style="list-style-type: none"> <li>■ When IP filtering is enabled, the DSLAM looks at IP traffic from the subscriber to authenticate the source IP address.</li> <li>■ When IP filtering is disabled, traffic passes all protocols. This does not apply to packets that are not IP type.</li> </ul> <p><b>IP Scoping</b> – Enable/Disable (Default = Enable). There must be an entry in this field.</p> <ul style="list-style-type: none"> <li>■ When IP Scoping is enabled, the DSLAM intercepts IP ARP and DHCP requests and responses.</li> <li>■ When IP Scoping is disabled, the DSLAM allows non-IP traffic to be forwarded.</li> </ul> <p><b>Domain Name</b> – Enter the domain name of the Internet Service Provider (ISP).</p>	
<b>Port VLAN (Port)</b>	<b>A-E-C</b>
<p>Gives the user the ability to configure one VLAN association on an individual port.</p> <p><b>DSL Port #</b> – Enter the DSL port number (Default = 1).</p> <p><b>VLAN</b> – Number of the VLAN port (Default = none). This field is read-only.</p> <p><b>Default NHR</b> – Enter the IP address of the next hop router in <i>nnn.nnn.nnn.nnn</i> format (Default = none). If the NHR IP address does not exist for that port, a default NHR IP address is used. If the default NHR IP address does not exist, the Address Resolution Protocol (ARP) request is ignored.</p>	

**Table 5-4. Bridge Options (2 of 2)**

<b>Client VLAN (Client)</b>	<b>A-E-D</b>
<p>Gives the user the ability to configure static clients on VLANs. As there are up to 32 clients per port, multiple screens are required to completely configure the port.</p> <p>For a list of VLAN IDs, press Ctrl-v.</p> <p><b>DSL Port #</b> – Enter the DSL port number (Default = 1).</p> <p><b>Number of clients</b> – Enter the number of clients to configure (0 – 32) (Default = none).</p> <p><b>User</b> – Enter the input number of the client (0 – 32) (Default = 0).</p> <p><b>IP Address</b> – Enter the client IP address in <i>nnn.nnn.nnn.nnn</i> format (Default = none). There must be an entry in this field. Typically, all IP addresses in the same VLAN would be on the same subnet.</p> <p><b>NHR</b> – Enter the IP address of the default next-hop router in <i>nnn.nnn.nnn.nnn</i> format (Default = none).</p> <p><b>VLAN</b> – VLAN ID between 2 and 4094. (This field is read-only.)</p> <p><b>Type</b> – S = Static or D = Dynamic. (This field is read-only.)</p>	
<b>ARP (Parameters and Add ARP Entry)</b>	<b>A-E-E (A and B)</b>
<p><i>Select:</i></p> <p><b>Parameters (A)</b></p> <p>Gives the user the ability to configure general Address Resolution Protocol (ARP) cache parameters.</p> <p><b>Complete Entry Timeout (minutes)</b> – Length of time that a complete entry remains in the ARP Table before removal. A complete entry is one for which there is a MAC address and a node has responded to the ARP request. Range = 1 to 200,000 minutes. (Default = 20)</p> <p><b>Incomplete Entry Timeout (minutes)</b> – Length of time in minutes that an incomplete entry remains in the ARP table before being removed. (An incomplete entry is an entry without a MAC address.) This is also the amount of time that a packet will remain in the system while waiting for address resolution. Range = 1 to 255 minutes. (Default = 3)</p> <p>NOTE: If you have made changes to this screen, you must do a card reset.</p> <p><b>ARP Entry (Add ARP Entry) (B)</b></p> <p>Gives the user the ability to add entries into the ARP cache.</p> <p><b>Item</b> – Enter 0 (zero) to add a new record.</p> <p><b>IP Address</b> – <i>nnn.nnn.nnn.nnn</i> format.</p> <p><b>MAC Address</b> – <i>xx-xx-xx-xx-xx-xx</i> format.</p> <p><b>VLAN</b> – Enter a VLAN ID between two and 4094 (Default = Null). There must be an entry made in this field.</p> <p><b>Trailer</b> – Yes/No (Default = No).</p> <p><b>Perm</b> – Yes/No (Default = No). If you select yes for Perm and no to proxy, the ARP entry will be saved in NVRAM (up to 32 entries). These are loaded when the card reboots.</p> <p>NOTE: For the Add ARP Entry screen, all other information entered is not stored in the nonvolatile memory and will be lost when you reset the card.</p>	

## DSL Configuration Service Node Screens

Use the SN Configuration screen to configure endpoint Service Node information.



### ► Procedure

- Follow this menu sequence:  
*Configuration* → *SN Configuration (A-F)*.
- The SN Configuration menu appears. Enter the desired value on the selected screen and field as shown in [Table 5-5](#) and press Return.

**Table 5-5. Service Node Options**

SN Configuration	A-F
Displays endpoint information for the 5620 DSL or 6310 MVL Service Node.	
<b>Port #</b> – Enter the DSL or MVL port number (1 to 4).	
<b>SN Type</b> – Model number of SN connected to the DSL port. For Model 8510, the SN is 5620. For Model 8310, the SN is 6310. (This field is read-only.)	
<b>System Name</b> – 16 alphanumeric characters. Enter the name assigned to the SN.	
<b>System Contact</b> – 32 alphanumeric characters. Enter the name or number of the person responsible for the SN.	
<b>System Location</b> – 16 alphanumeric characters. Enter the location of the SN.	
<b>Model Num</b> – Model number of card. (This field is read-only.)	
<b>Serial Num</b> – Serial number of card. (This field is read-only.)	
<b>Firmware Rev</b> – Version of firmware. (This field is read-only.)	
<b>Hardware Rev</b> – Version of hardware. (This field is read-only.)	
<b>CAP Rev</b> – (For Model 8510 only.) Version of CAP chipset. (This field is read-only.)	
<b>MVL Rev</b> – (For Model 8310 only.) Version of MVL chipset. (This field is read-only.)	
<b>Reset SN?</b> – Yes/No. Enter yes to reset the SN and begin a selftest.	
NOTE: Entering yes in the Reset SN field will temporarily disrupt the data path on the specified DSL port while the SN resets.	
<b>SN Selftest Results</b> – Pass/Fail. This field displays the results of the SN selftest, when completed.	

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# Monitoring the Hotwire DSLAM

# 6

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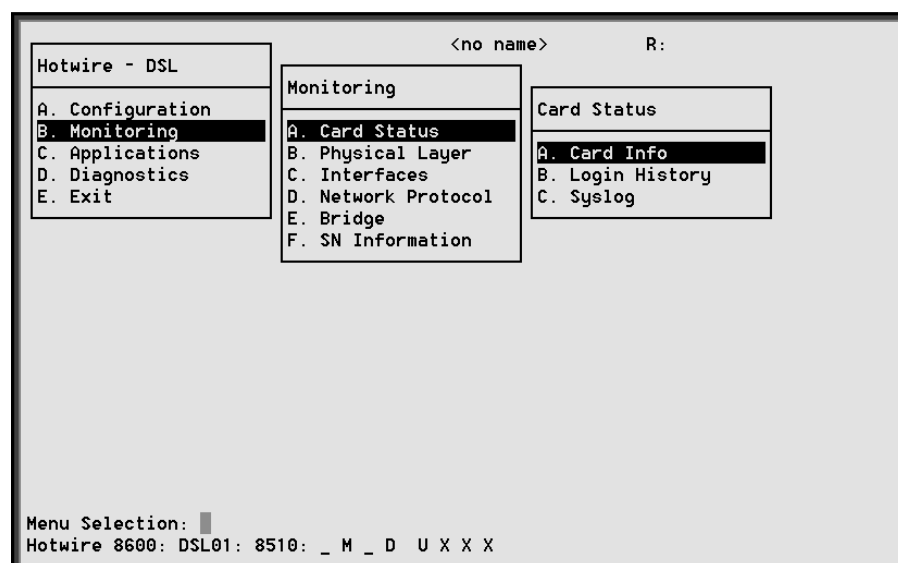
## Overview

The Hotwire DSLAM lets you to monitor the activity of the Hotwire DSL cards. When you select Monitoring from the Hotwire DSL Main Menu, a menu tree of selections on history and error logs, performance statistics, card status, and physical and logical interface status information is presented.

Most of the Monitoring screens are read only; that is, the information displayed is to help you gather pertinent information and isolate potential problem areas. For diagnostic tools and hardware and software troubleshooting techniques, see Chapter 7, *Diagnostics and Troubleshooting*.

## DSL Monitoring Card Status Screens

Use the Card Status screens to display read-only system information.



► **Procedure**

To view general card information, login history, and the syslog:

1. Follow this menu sequence:

*Monitoring* → *Card Status (B-A)*

2. The Card Status menu appears. Select the submenu option as shown in Table 6-1 and press Return.

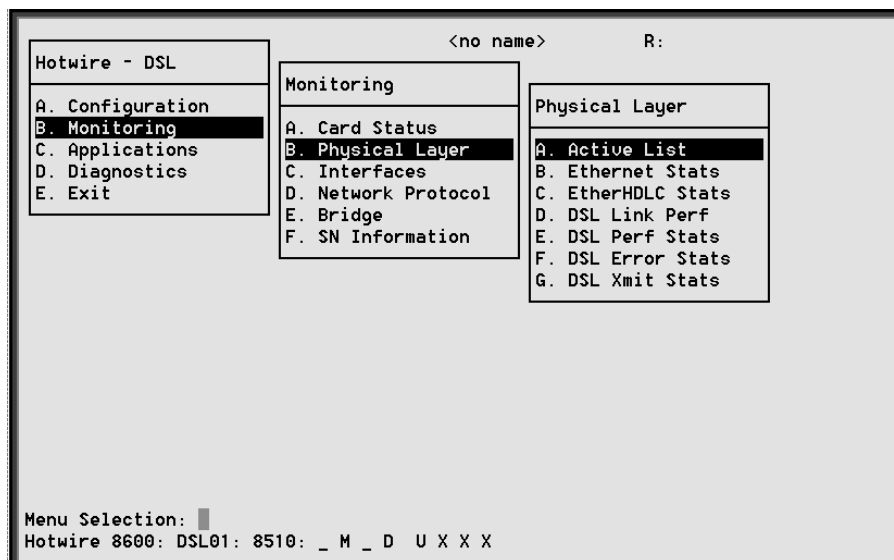
**Table 6-1. Card Status Options**

<b>Card Info (General Card Information)</b>	<b>B-A-A</b>
Displays card information.	
<b>Card Name</b> – Name assigned to the card.	
<b>Card Location</b> – Physical location of the system.	
<b>Card Contact</b> – Name or number of the person responsible for the card.	
<b>Card Up Time</b> – Length of time the card has been running.	
<b>Available Buffers</b> – Number of Buffers not in use.	
<b>Buffer Ram Size</b> – Size of the Buffer Ram.	
<b>Fast Data Ram Size</b> – Total and Available Fast Data Ram.	
<b>Card Type</b> – Type of Card (MCC, DSL).	
<b>Model Num</b> – Model number of card.	
<b>Serial Num</b> – Serial number of card.	
<b>Firmware</b> – Version of firmware.	
<b>CAP Firmware</b> – (For Model 8510 only.) Version CAP chipset.	
<b>MVL Rev</b> – (For Model 8310 only.) Version of MVL chipset.	
<b>Hardware Rev</b> – Version of hardware.	
<b>Login History</b>	<b>B-A-B</b>
Displays a list of information on the 10 most recent logins.	
<b>User</b> – User ID.	
<b>Time</b> – Date and time of the most recent login.	
<b>Local/Remote</b> – Local or Remote Connection.	
<b>Number of unsuccessful Console logins</b> – Number of console logins that were incorrect in the last 10 attempts.	
<b>Number of unsuccessful Telnet logins</b> – Number of Telnet logins that were incorrect in the last 10 attempts.	
<b>Syslog</b>	<b>B-A-C</b>
Displays a timestamp sequential list of operational type errors by date and error. There is one logged error per line in a downward scrolling list. There is a 17-error entry maximum.	



## DSL Monitoring Physical Layer Screens

Use the Physical Layer screens to display read-only system information about physical ports.



### ► Procedure

To view the active ports list, Ethernet statistics, and HDLC bus statistics:

1. Follow this menu sequence:  
*Monitoring* → *Physical Layer* (**B-B**)
2. The Physical Layer menu appears. Select the submenu option as shown in Table 6-2 and press Return.

**Table 6-2. Physical Layer Options (1 of 5)**

Active List (Active Ports List)	B-B-A
Displays a list of the current status of all the active ports (e1a = Ethernet; s1c, s1d, s1e, and s1f = DSL cards).	
<b>Num</b> – Number of the port.	
<b>Name</b> – Name of the port.	
<b>Description</b> – Type of port.	
<b>MAC Address</b> – MAC address of the active port. (Internal dummy address used for non-Ethernet ports.)	
<b>Status</b> – Active or disconnected.	

Table 6-2. Physical Layer Options (2 of 5)

Ethernet Stats (Ethernet Statistics)	B-B-B
<p>Displays a list of the Ethernet statistics of the LAN port (e1a).</p> <p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters.</p> <p><b>Port</b> – Type of port (e1a).</p> <p><b>Initialized Ethernet Ports</b> – e1a (There is only one other net port on the card).</p> <p><b>LAN Address</b> – LAN (or MAC) address of the Ethernet port.</p> <p><b>Bytes received</b> – Number of bytes have been received by the Ethernet port since the last reset.</p> <p><b>Bytes transmitted</b> – Number of bytes have been transmitted by the Ethernet port since the last reset.</p> <p><b>Packets received</b> – Number of packets transmitted by the Ethernet port since the last reset and what type.</p> <ul style="list-style-type: none"> <li>– Multicast – Single packets copied to a specific subset of network addresses.</li> <li>– Broadcasts – Messages sent to all network destinations.</li> <li>– Flooded – Information received, then sent out to each of the interfaces.</li> <li>– Filtered – Processes or devices that screen incoming information.</li> <li>– Discarded – Packets discarded.</li> <li>– VLAN Error – Number of errors transmitted by the VLAN and what type.</li> </ul> <p><b>Errors</b> – Number of errors transmitted by the Ethernet port and what type.</p> <ul style="list-style-type: none"> <li>– M = Multi-collision frames – not counted in this release and always set to 0.</li> <li>– L = Late collisions – collision detected often; at least 64 bytes have been transmitted.</li> <li>– E = Excessive collisions – port tried to send a packet 15 times without success.</li> <li>– Overruns – No buffer space.</li> <li>– Bad CRC – Cyclic Redundancy Check.</li> <li>– Framing – Receiver improperly interprets set of bits within frame.</li> <li>– Jumbo gram – Ethernet packet too long.</li> <li>– Overflow – Part of traffic that is not carried.</li> <li>– Buffer – No buffer space.</li> </ul> <p><b>Fast restarts</b> – Number of fast restarts and what type (RX off, TX off, Mem err).</p> <p><b>Endless Pkt</b> – Number of endless packets received on the Ethernet port.</p> <p><b>Startless Pkt</b> – Number of startless packets received on the Ethernet port.</p> <p><b>Babble</b> – Number of garbled packets received due to crosstalk.</p>	

Table 6-2. Physical Layer Options (3 of 5)

Ethernet Stats (Ethernet Statistics) (continued)	B-B-B
<p><b>Packets transmitted</b> – Number of packets transmitted by the Ethernet port and what type.</p> <ul style="list-style-type: none"> <li>– Multicast – Single packets copied to a specific subset of network addresses.</li> <li>– Broadcast – Messages sent to all network destinations.</li> <li>– Flooded – Information received, then sent out to each of the interfaces.</li> <li>– Local origin – Locally transmitted packet; e.g. Ping.</li> <li>– Queued – Packets waiting to be processed.</li> </ul> <p><b>Errors</b> – Number of errors transmitted by the Ethernet port and what type.</p> <ul style="list-style-type: none"> <li>– M = Multi-collision frames – not counted this release and always set to 0.</li> <li>– L = Late collisions – collision detected often; at least 64 bytes have been transmitted.</li> <li>– E = Excessive collisions – port tried to send a packet 15 times without success.</li> </ul> <p><b>Disconnects</b> – Number of disconnects on the Ethernet port and what type.</p> <ul style="list-style-type: none"> <li>– Disable – Transmit error, timed out.</li> <li>– MAU drop – Transceivers dropped.</li> <li>– Xmit fail – Transmit fail</li> </ul>	
EtherHDLC Stats (EtherHDLC Statistics)	B-B-C
<p>Displays statistics in real time on the HDLC link later protocol between the Access Node and each Service Node (s1c, s1d, s1e, and s1f ports.) (See field definitions from previous screen.)</p> <p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters.</p> <p><b>Port name</b> – Port name (s1c, s1d, s1e, or s1f).</p> <p><b>Initialized EtherHDLC Ports</b> – s1c, s1d, s1e, or s1f.</p> <p><b>Bytes received</b> – Number of bytes received.</p> <p><b>Bytes transmitted</b> – Number of bytes transmitted.</p> <p><b>Packets received</b> – Number of packets received.</p> <p><b>Packets transmitted</b> – Number of packets transmitted.</p> <p><b>Errors</b> – Number of other receive errors. (If a high number of errors have been received, the card may have to be reset.)</p>	

Table 6-2. Physical Layer Options (4 of 5)

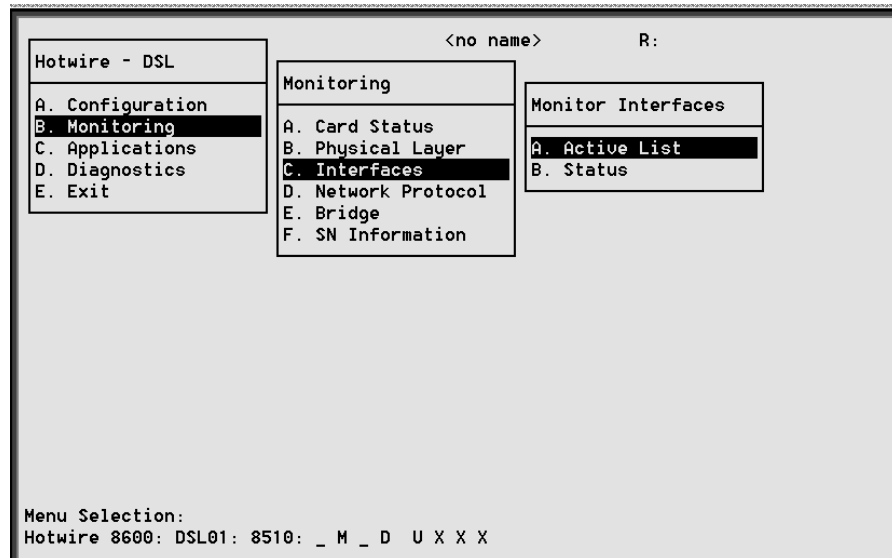
<b>DSL Link Perf (DSL Link Performance Summary)</b>	<b>B-B-D</b>
<p>Displays a summary of the link performance for each of the DSL ports.</p> <p>Enter port number one to four to see the fields for current 15-minute period (real time count of events during the past 0 to 15 minutes), previous 15-minute period (data updated every 15 minutes), previous 1-hour period (data updated every hour), and 24-hour period (data is updated every hour).</p> <p><b>Port #</b> : – Enter the port number (1 to 4) you wish to monitor.</p> <p><b>Dn Margin</b> – Measure of the noise margin on the specified port in the downstream direction.</p> <p><b>Up Margin</b> – Measure of the noise margin on the specified port in the upstream direction.</p> <p><b>DnErrRate</b> – This statistic is not available for this release and an NA appears for each time period.</p> <p><b>UpErrRate</b> – Block error rate in upstream direction. Error rate = bad blocks/good blocks and is expressed as <math>A \times 10^{-B}</math>.</p> <p><b>DnAttEst</b> – Measure of the downstream transmission loss on the DSL line.</p> <p><b>UpAttEst</b> – Measure of the upstream transmission loss on the DSL line.</p> <p><b>Operating Speeds</b> – Downstream and upstream operating speeds.</p>	
<b>DSL Perf Stats (DSL Performance Stats)</b>	<b>B-B-E</b>
<p>Displays the link performance for each of the DSL ports. Tells you the number of times the link has been down and the elapsed time the link has been up.</p> <p>Enter port number one to four to see the fields for current 15-minute period (real time count of events during the past 0 to 15 minutes), previous 15-minute period (data updated every 15 minutes), previous 1-hour period (data updated every hour), and 24-hour period (data updated every hour).</p> <p><b>Port #</b> : – Enter the port number (1 to 4) you wish to monitor.</p> <p><b>15min Valid</b> – Number of 15-minute intervals in which downstream performance data has been received across the DSL link from the endpoint (SN).</p> <p><b>pkt rcv up</b> – Number of upstream packets received.</p> <p><b>pkt snt up</b> – Number of upstream packets sent.</p> <p><b>pkt lost up</b> – Number of upstream packets lost.</p> <p><b>pkt rcv dn</b> – Number of downstream packets received.</p> <p><b>pkt snt dn</b> – Number of downstream packets sent.</p> <p><b>pkt lost dn</b> – Number of downstream packets lost.</p> <p><b>Link dn count</b> – Number of times the DSL link has gone down.</p> <p><b>elp lnk up</b> – Count in seconds of the elapsed time the link has been up.</p> <p><b>elp time</b> – Count in seconds of the elapsed time since the DSL card was last reset.</p> <p><b>Pct link up</b> – Percentage of time the link has been up in the past 24 hours.</p> <p><b>k octs sent dn</b> – How many thousands of octets have been sent to the SN.</p> <p><b>k octs rcv dn</b> – How many thousands of octets have been received by the SN.</p> <p><b>k octs sent up</b> – How many thousands of octets have been sent upstream from the SN.</p> <p><b>k octs rcv up</b> – How many thousands of octets have been received upstream from the SN.</p>	

Table 6-2. Physical Layer Options (5 of 5)

DSL Error Stats	B-B-F
<p>Displays the error performance (margin) rates for each of the DSL ports after selecting a specific DSL port number. Margin is a measure of performance.</p> <p>Enter port number one to four to see the fields for current 15-minute period (real time count of events during the past 0 to 15 minutes), previous 15-minute period (data updated every 15 minutes), previous 1-hour period (data updated every hour), and 24-hour period (data bucket updated every hour). A margin of 0 db equals an expected bit error rate of <math>10^{-7}</math>. (The higher the margins, the fewer the errors.)</p> <p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters.</p> <p><b>dn margin</b> – Measure of the noise margin on the specified port in the downstream direction.</p> <p><b>up margin</b> – Measure of the noise margin on the specified port in the upstream direction.</p> <p><b>dn err rate</b> – This statistic is not available for this release and an NA appears for each time period.</p> <p><b>up err rate</b> – Block error rate in upstream direction. Error rate = bad blocks/good blocks and is expressed as <math>A \times 10^{-B}</math>.</p> <p><b>dn err secs</b> – Count of the number of down error seconds with at least one block error in the downstream data path.</p> <p><b>up err secs</b> – Count of the number of up error seconds with at least one block error in the upstream data path.</p> <p><b>dn svr err sec</b> – Count of the number of seconds with at least 800 block errors in the downstream data path.</p> <p><b>up svr err sec</b> – Count of the number of seconds with at least 800 block errors in the upstream data path.</p>	
DSL Xmit Status (DSL Transmit Stats)	B-B-G
<p>Displays the transmit and receive statistics for each of the DSL ports after selecting a specific DSL port number.</p> <p>Enter port number one to four to see the fields for current 15-minute period (real time count of events during the past 0 to 15 minutes), previous 15-minute period (data updated every 15 minutes), previous 1-hour period (data updated every hour), and 24-hour period (data updated every hour).</p> <p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters.</p> <p><b>Port #</b> – Enter the port number (1 to 4) you wish to monitor.</p> <p><b>dn xmit pwr</b> – Measure of the power level of the downstream signal sent to the SN (in db).</p> <p><b>up xmit pwr</b> – Measure of the power level of the upstream signal sent by the SN (in db).</p> <p><b>dn rx gain</b> – Measure of how much amplification was applied to the signal received at the SN.</p> <p><b>up rx gain</b> – Measure of how much amplification was applied to the signal received at the DSLAM port.</p> <p><b>dn att est</b> – Measure of the downstream transmission loss on the DSL line.</p> <p><b>up att est</b> – Measure of the upstream transmission loss on the DSL line.</p>	

## DSL Monitoring Interfaces Screens

Use the Interfaces screens to display read-only system information about interfaces.



### ► Procedure

To view the active interfaces list, and interface status list:

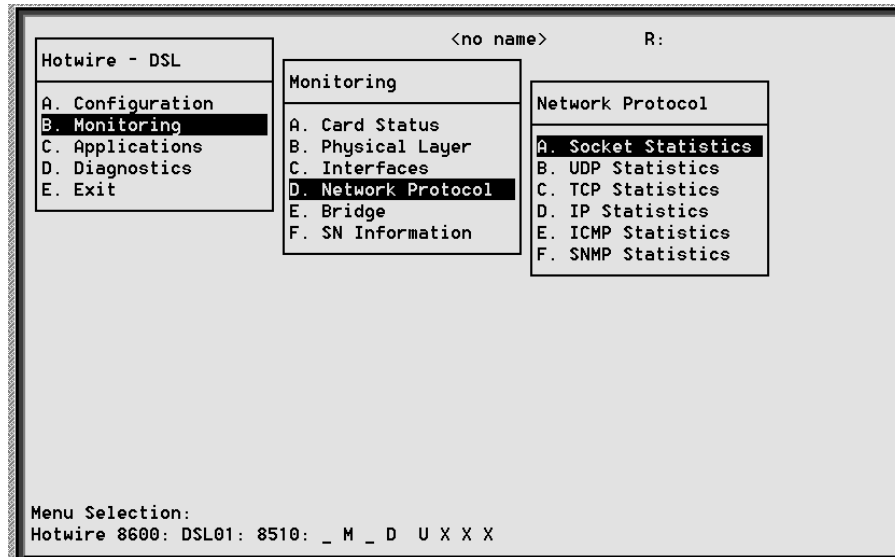
1. Follow this menu sequence:  
*Monitoring* → *Interfaces* (**B-C**)
2. The Monitor Interfaces menu appears. Select the submenu option as shown in Table 6-3 and press Return.

**Table 6-3. Monitor Interfaces Options**

<b>Active List (Active Interfaces List)</b>	<b>B-C-A</b>
<p>Displays a list of the current status of all of the active interfaces in the card.</p> <p><b>if</b> – Number of the interface.</p> <p><b>name</b> – Name of the interface.</p> <p><b>type</b> – Interface type (static).</p> <p><b>link</b> – Name of the protocol on the interface.</p> <p><b>state</b> – Current state of the interface.</p> <p><b>ll-state</b> – Not applicable.</p> <p><b>port</b> – Port linked to this interface.</p> <p>The only information that changes on this screen is the state (active or port-wait) column.</p>	
<b>Status (Interface Status)</b>	<b>B-C-B</b>
<p>Displays a list of additional information, after a specific interface (port) has been selected.</p> <p><b>if name</b> – Enter the name of the desired interface.</p> <p><b>protocol</b> – Type of protocol for the entered interface name.</p> <p><b>port</b> – Port linked to this interface.</p> <p><b>restarts</b> – Number of times interface has been restarted.</p> <p><b>user</b> – &lt;na&gt; or none.</p> <p><b>type</b> – Static.</p> <p><b>link-downs</b> – Number of times the link has gone down.</p> <p><b>state</b> – Active or prtwait.</p> <p><b>inactivity T/O</b> – Number of times the interface has timed out.</p>	

## DSL Network Protocol Screens

Use the Network Protocol screens to display read-only system information.



### ► Procedure

To view socket statistics, UDP statistics, TCP data and connection statistics, IP statistics, ICMP statistics, and SNMP statistics. (These statistics only apply to traffic over the backplane.)

1. Follow this menu sequence:

*Monitoring* → *Network Protocol* (**B-D**)

2. The Network Protocol menu appears. Select the submenu option as shown in Table 6-4 and press Return.



**Table 6-4. Network Protocol Options (1 of 5)**

<b>Socket Statistics</b>	<b>B-D-A</b>
<p>Displays information for the interface. Enter the socket name from the active socket list to view information on the application assigned to the specified socket number.</p> <p><b>Start Socket</b> – Enter the socket number to start the active socket list.</p> <p><b>Active Socket List</b> – This is the heading information for the following fields. It lists all the information about the currently selected socket.</p> <p>In addition, the lower right-hand corner of the screen displays a Socket Statistics window with detailed information about the selected destination. The Socket Statistics window displays the following information:</p> <p><b>Socket</b> – Socket number.</p> <p><b>Socket name</b> – Internal name of the socket.</p> <p><b>Family</b> – Family of this socket (DARPA Internet).</p> <p><b>Type</b> – Socket type (stream or datagram).</p> <p><b>Local</b> – Port number on this card.</p> <p><b>Remote</b> – Port number on remote card.</p> <p><b>State</b> – Current state of the socket.</p> <p><b>Input Bytes</b> – Bytes waiting in the socket for the owning application to process (will go to 0 when processed by the application).</p> <p><b>Send Bytes</b> – Bytes waiting to be sent out to the remote machine.</p> <p><b>PDU Drops</b> – Incoming packets dropped (usually due to a lack of space).</p> <p><b>Byte Drops</b> – Outgoing packets dropped (usually due to a lack of space).</p>	
<b>UDP Statistics</b>	<b>B-D-B</b>
<p>Displays information on User Datagram Protocol (UDP) statistics.</p> <p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters.</p> <p><b>Output Packets</b> – Number of UDP packets sent out of the card.</p> <p><b>Input Packets</b> – Number of UDP packets coming into the card.</p> <p><b>No Receive Port</b> – Number of UDP packets coming into the card that had no receive port waiting for this packet.</p> <p><b>Unchecksummed</b> – Number of UDP packets coming into the card that had no checksum.</p> <p><b>Header Error</b> – Number of UDP packets coming into card that had an error with the packet header.</p> <p><b>Incorrect Checksum</b> – Number of UDP packets coming into the card that had a bad checksum.</p> <p><b>Bad Length</b> – Number of UDP packets coming into the card that are an illegal length (too short).</p> <p><b>Other Error</b> – Number of UDP packets coming into the card that had an error, but not one of the above.</p>	

Table 6-4. Network Protocol Options (2 of 5)

TCP Statistics (TCP Data Statistics)	B-D-C
<p>Displays a summary of the Transmission Control Protocol (TCP) data activity (packets and bytes transmitted and received) on all interfaces on the card. The left column is for received data and the right column is for transmitted data.</p>	
<p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters.</p>	
<p><i>Left column:</i></p>	
<p><b>Packets Received</b> – Number of TCP packets received by the card.</p>	
<p><b>acks</b> – Number of acknowledgements received for transmitted packets. (Also shows the number of bytes that were acknowledged as received by the remote system.)</p>	
<p><b>duplicate acks</b> – Number of duplicate acknowledgements received.</p>	
<p><b>acks for unsent data</b> – Number of acknowledgements received for data that has not been sent yet.</p>	
<p><b>pkts/bytes rcvd in-sequence</b> – Number of packets/bytes correctly received in sequence for data that had to be split in multiple TCP packets.</p>	
<p><b>dupl pkts/bytes</b> – Number of duplicate packets/bytes received.</p>	
<p><b>pkts/bytes w. some dup. data</b> – Number of packets/bytes with some duplicated data. (Duplicated data is discarded by TCP.)</p>	
<p><b>pkts rcvd out-of-order</b> – Packets received out of order.</p>	
<p><b>pkts of data after window</b> – Packets of data received after our receive window is full.</p>	
<p><b>window probes</b> – Packets received looking for space in our receive window.</p>	
<p><b>window update pkts</b> – Packets received from the remote system advertising a new window size.</p>	
<p><b>pkts rcv after close</b> – Packets received after the (our) TCP connection is shut down.</p>	
<p><b>discarded for bad checksum</b> – Packets that were discarded because the checksum failed.</p>	
<p><b>discarded for bad header offset fields</b> – Packets discarded because the TCP header was corrupted.</p>	
<p><b>discarded because packet too short</b> – Packets discarded because the packet was too short (not a complete TCP header).</p>	
<p><i>Right column:</i></p>	
<p><b>Packets sent</b> – Number of TCP packets sent by the card.</p>	
<p><b>data pkts</b> – Number of the sent packets that were data packets instead of TCP control packets.</p>	
<p><b>data pkts retransmit</b> – Number of packets that had to be transmitted.</p>	
<p><b>ack-only pkts</b> – Number of sent packets that contained only an acknowledgement of a received packet and no additional data.</p>	
<p><b>URG only pkts</b> – Number of packets that contained only an Urgent flag and no data.</p>	
<p><b>window Probe Pkts</b> – Number of packets that were window probes.</p>	
<p><b>window Update Pkts</b> – Number of packets that were advertising our new window size.</p>	
<p><b>control Pkts</b> – Number of control packets sent (SYN, FIN, or RST flag).</p>	

Table 6-4. Network Protocol Options (3 of 5)

TCP Connection Statistics	B-D-C
<p>When you press Return on the TCP Data Statistics screen, the TCP Connection Statistics screen is displayed, showing a summary of the TCP connection activity on all interfaces on the card.</p> <p><b>connection requests</b> – Number of TCP connections initiated by a process on this card.</p> <p><b>connection accepts</b> – Number of TCP connections accepted by this card.</p> <p><b>connections established</b> – Number of connections established.</p> <p><b>connections closed/dropped</b> – Number of connections closed (normally) including those dropped.</p> <p><b>embryonic connections closed</b> – Number of connections dropped before data transfer.</p> <p><b>segments updated rtt</b> – Number of packets that updated the Round Trip Time (RTT) and the total number of times TCP attempted to update the RTT.</p> <p><b>retransmit timeouts</b> – Number of times a packet had to be transmitted because it was not acknowledged and the number of times a connection was dropped because a packet could not be transmitted.</p> <p><b>persist timeout</b> – Number of times the TCP persistence timer went off and sent a probe to the remote system.</p> <p><b>keepalive timeouts</b> – Number of times a TCP keepalive request timed out.</p> <p><b>keepalive probes sent</b> – Number of TCP keepalive probes sent.</p> <p><b>connections dropped by keepalive</b> – Number of connections dropped because the keepalive timer failed to get any responses.</p>	
IP Statistics	B-D-D
<p>Displays a summary of the IP activity on all interfaces on the card.</p> <p><b>total pkts rev</b> – Total number of IP packets received by this card, with errors broken down on the right of the screen.</p> <p><b>fragments rev</b> – Number of packet fragments received, with dropped fragments on the right of the screen.</p> <p><b>packets were fragmented on transmit</b> – Number of packets that were fragmented on transmit.</p> <p><b>packets were received on transmit</b> – Number of packets that were fragmented on transmit and the number of fragments that were created by those packets.</p> <p><b>packets forwarded</b> – Number of packets that were forwarded to another system.</p> <p><b>packets not forwardable</b> – Number of packets that could not be forwarded. (Usually due to packet errors or routing problems.)</p> <p><b>packet redirects sent</b> – Number of redirect messages sent to other systems because they sent a packet that should not be sent to this card.</p> <p><b>network broadcasts received for local networks</b> – Number of network broadcasts received for local networks.</p> <p><b>network broadcasts forwarded by media broadcast</b> – Number of network broadcasts forwarded by media broadcast.</p> <p><b>network broadcasts partially processed</b> – Number of network broadcasts dropped due to an error.</p>	

**Table 6-4. Network Protocol Options (4 of 5)**

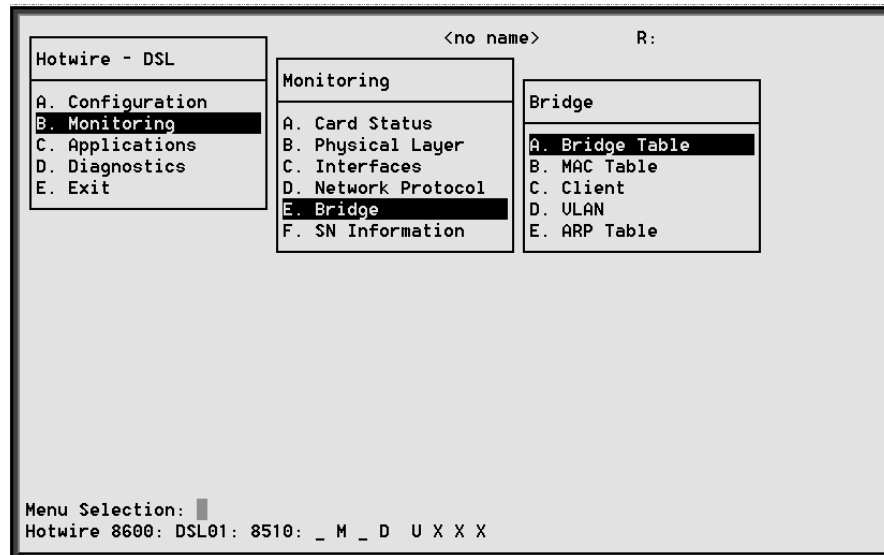
<b>ICMP Statistics (ICMP Packet Statistics)</b>	<b>B-D-E</b>
<p>Displays a summary of the Internet Control Message Protocol (ICMP) activity on all interfaces of the card such as echo replies, source quench messages, and information requests with their output, input, and status.</p> <p>The columns show output and input packet counts. Note that the Status column is only applicable for "routing redirect."</p> <p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters. Press Return to see more ICMP statistics.</p>	
<b>SNMP Statistics</b>	<b>B-D-F</b>
<p>Displays information on Simple Network Management Protocol (SNMP) statistics.</p> <p>The counters increment in real time and you may enter Ctrl-r at any time to reset the counters.</p> <p><b>In Packets</b> – Total number of SNMP Protocol Data Units (PDUs) received by the agent.</p> <p><b>Get Requests</b> – Total number of SNMP Get Request PDUs accepted and processed by the SNMP agent.</p> <p><b>Get Next Requests</b> – Total number of SNMP Get Next PDUs accepted and processed by the SNMP agent.</p> <p><b>Total Requested Variables</b> – Total number of Management Information Base (MIB) retrieved successfully by the SNMP agent as a result of receiving valid SNMP Get Request and Get Next PDUs.</p> <p><b>Set Requests</b> – Total number of SNMP Set Requests PDUs accepted and processed by the SNMP agent.</p> <p><b>Total Set Variables</b> – Total number of MIB objects modified successfully by the SNMP agent as a result of receiving valid SNMP Set Requests PDUs.</p> <p><b>ASN.1 Parse Errors</b> – Total number of Abstract Syntax Notation One (ASN.1) or Bit Error Rate (BER) errors encountered when decoding received SNMP messages.</p> <p><b>Out Packets</b> – Total number of SNMP PDU responses sent by the agent.</p> <p><b>Out Too Big Errors</b> – Total Number of SNMP PDUs generated by the SNMP agent for which the value of error status field is too big.</p> <p><b>Out No Such Names</b> – Total number of SNMP PDUs generated by the SNMP agent for which the value of error status field is "no such name."</p> <p><b>Out Bad Values</b> – Total number of SNMP PDUs generated by the SNMP agent for which the value of the error status field is bad value.</p> <p><b>Out General Errors</b> – Total number of SNMP PDUs generated by the SNMP agent for which the value of error status is Gen Err.</p> <p><b>Read-only Errors</b> – Total number of SNMP PDUs delivered by the SNMP agent for which the value of the error status field is read-only.</p> <p><b>Out Get Response</b> – Total number of Get-Response PDUs sent out by the SNMP agent.</p> <p><b>Out Traps</b> – Total number of SNMP Traps PDUs generated by the SNMP agent.</p> <p><b>SNMP Status</b> – Indicates the state of the SNMP Agent. The first byte = error code, the second byte = sub-routine code.</p>	

**Table 6-4. Network Protocol Options (5 of 5)**

<b>SNMP Authentication Statistics</b>	<b>B-D-F</b>
<p>When you press Return on the SNMP Statistics screen, the SNMP Authentication Statistics screen is displayed, giving you additional Community Administration information.</p> <p><b>Community Administration</b> – Number of SNMP Protocol Data Units (PDUs) with community based authentication.</p> <ul style="list-style-type: none"><li>– Bad Versions – Total number of SNMP messages delivered to the SNMP agent for an unsupported SNMP version.</li><li>– Bad Community Name – Total number of SNMP messages delivered to the SNMP agent that used an SNMP community name not known to the entity.</li><li>– Bad Community Use – Total number of SNMP messages delivered to the SNMP agent that represent an SNMP operation not allowed by the SNMP community named in the message.</li></ul>	

## DSL Bridge Screens

Use the Bridge screens to display read-only system information.



### ► Procedure

To view bridge information:

1. Follow this menu sequence:  
*Monitoring → Bridge (B-E)*
2. The Bridge menu appears. Select the submenu option as shown in Table 6-5 and press Return.

**Table 6-5. Bridge Options (1 of 2)**

<b>Bridge Table</b>	<b>B-E-A</b>
<p>Displays information on various bridge functions.</p> <p><b>Item</b> – Enter the item number you wish to display from one to 16.</p> <p><b>VLAN</b> – VLAN ID between two and 4094 (Default = Null).</p> <p><b>Mux Fwd</b> – Enable/Disable.</p> <p><b>IP Filter</b> – Enable/Disable.</p> <p><b>IP Scoping</b> – Enable/Disable.</p> <p><b>Domain Name</b> – Domain name of the card. There can be up to 12 VLAN addresses at a time, with a maximum of 30 characters each.</p>	
<b>MAC Table</b>	<b>B-E-B</b>
<p>Displays the MAC table.</p> <p><b>Bridge</b> – lb0 (Equivalent to e1a). Name of the logical bridge.</p> <p><b>Entry #</b> – Enter the MAC table entry number you wish to view.</p> <p><b>Entries</b> – Number of entries in the MAC table.</p> <p><b>Bridge Timer</b> – Timer that is used to show dynamic MAC addresses.</p> <p><b>#</b> – Entry number.</p> <p><b>MAC Address</b> – MAC address in xx.xx.xx.xx.xx.xx format.</p> <p><b>VLAN ID</b> – VLAN ID associated with the MAC address.</p> <p><b>Age (Secs)</b>– Age in seconds since the address was last used.</p> <p><b>Intf</b> – Interface behind which the network element associated with the MAC address lies.</p> <p><b>Flags</b> – Dynamic = MAC addresses that are determined via DHCP. Perm (DHCP) = MAC addresses are determined by the lease time. Entries in the MAC table will be removed when the lease time expires.</p>	

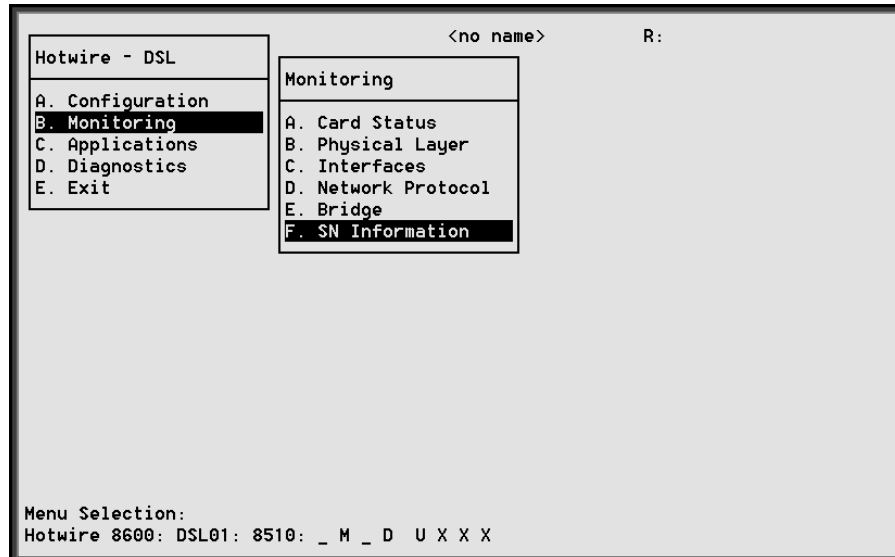
Table 6-5. Bridge Options (2 of 2)

Client	B-E-C
<p>Displays specific attributes on a per port basis.</p> <p><b>DSL Port #</b> – Enter the DSL port number 1–4 (Default = 1).</p> <p><b>User to Display</b> – Entry number.</p> <p><b>Total</b> – Total number of users.</p> <p><b>User</b> – Enter the input number of the client (Default = 0).</p> <p><b>IP Address</b> – Client IP address in <i>nnn.nnn.nnn.nnn</i> format (Default = 0).</p> <p><b>NHR</b> – IP address of the default next hop router in <i>nnn.nnn.nnn.nnn</i> format.</p> <p><b>VLAN</b> – VLAN ID between two and 4094 (Default = none). (This field is read-only.)</p> <p><b>Type</b> – S = Static or D = Dynamic. (This field is read-only.)</p> <p><b>Lease Expiration</b> – Date and time when the lease expires.</p> <p><b>Port Specific Parameters</b> – Enabled/Disabled. Shows active VLAN information.</p> <p>In order to display the following information, VLAN has to be activated (*) on the Port screen in the Configuration Bridge screen menu (<b>A-E-C</b>)</p> <p><b>DNHR:</b> – Default next-hop router name.</p> <p><b>IP Scoping:</b> – Enabled/Disabled.</p> <p><b>Mux Mode:</b> – Enabled/Disabled.</p> <p><b>IP Filtering:</b> – Enabled/Disabled. IP source filtering.</p>	
VLAN	B-E-D
<p>Displays VLAN information.</p> <p><b>Item</b> – Enter the item to display.</p> <p><b>VLAN</b> – VLAN ID between two and 4094 (Default = none). (This field is read-only.)</p> <p><b>Ports</b> – DSL ports that are members of the VLAN.</p> <p>NOTE: The Ethernet interface is a member of all VLANs.</p>	
ARP Table	B-E-E
<p>Displays the current Address Resolution Protocol (ARP) cache.</p> <p><b>Line</b> – Sequential number of line.</p> <p><b>IP Address</b> – Internet Protocol Address.</p> <p><b>MAC Address</b> – MAC address associated with the IP address. (An incomplete can be shown in this column for some internal entries such as the backplane.)</p> <p><b>Min</b> – Number of minutes since this entry was last used.</p> <p><b>VLAN</b> – VLAN ID between two and 4094 (Default = none). (This field is read-only.)</p> <p><b>Flags</b> – Various flags associated with this entry.</p> <ul style="list-style-type: none"> <li>– PM = permanent</li> <li>– PB = publish this entry (respond for other hosts)</li> <li>– TR = trailers</li> <li>– PX = proxy ARP (card will proxy ARP for this IP address)</li> <li>– SB = subnet proxy ARP.</li> </ul>	



## DSL SN Information Screen

Use the SN Information screen to display read-only Service Node information.



### ► Procedure

1. Follow this menu sequence:  
*Monitoring* → *SN Information* (**B-F**)
2. The SN menu appears. The information displayed on this screen is shown in Table 6-6.

**Table 6-6. Service Node Options**

<b>SN Information</b>	<b>B-F</b>
<p>Displays Service Node information.</p> <p><b>Port #</b> – Enter the DSL or MVL port number (1 to 4).</p> <p><b>SN Type</b> – Model number of endpoint. For Model 8510, the SN is 5620. For Model 8310, the SN is 6310 MVL modem.</p> <p><b>System Name</b> – 16 alphanumeric characters. Name assigned to the endpoint.</p> <p><b>System Contact</b> – 32 alphanumeric characters. Name or number of the person responsible for the endpoint.</p> <p><b>System Location</b> – 16 alphanumeric characters. Physical location of the system.</p> <p><b>Model Num</b> – Model number of the endpoint.</p> <p><b>Serial Num</b> – Serial number of the endpoint.</p> <p><b>Firmware Rev</b> – Version of firmware.</p> <p><b>Hardware Rev</b> – Version of hardware.</p> <p><b>CAP Rev</b> – (For Model 8510 only.) Version of CAP chipset.</p> <p><b>MVL Rev</b> – (For Model 8310 only.) Version of MVL chipset.</p>	

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# Diagnostics and Troubleshooting

# 7

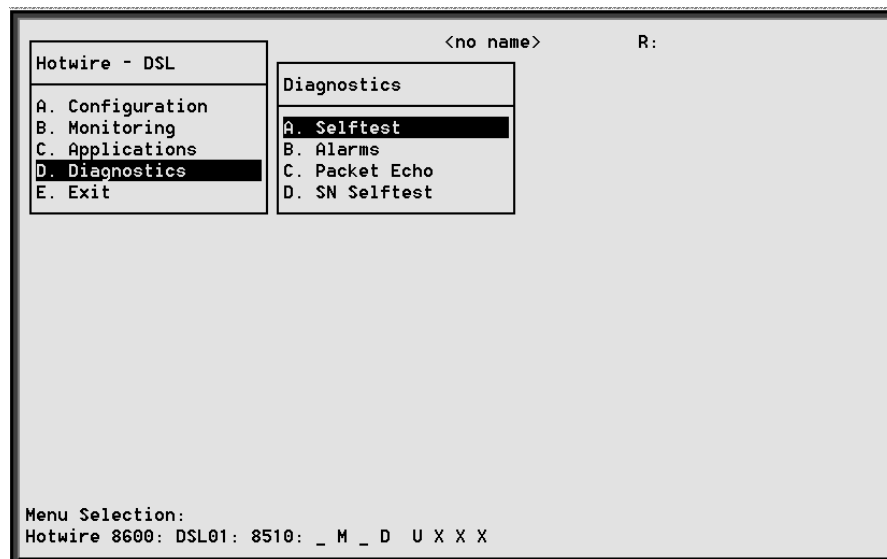
---

## Applications Screens

This menu selection is not currently supported on this card.

## Diagnostic Screens

Use the Diagnostics submenu to perform selftests or view alarm status.



## ► Procedure

To view selftest, card alarm, packet test, and SN self-test information:

1. Follow these menu sequences:
  - Diagnostics* → *Selftest (D-A)*
  - Diagnostics* → *Alarms (D-B)*
  - Diagnostics* → *Packet Echo (D-C)*
  - Diagnostics* → *SN Selftest (D-D)*
2. The Diagnostics menu appears. Select the submenu option as shown in Table 7-1 and press Return.

**Table 7-1. Diagnostics Options**

<b>Selftest</b>	<b>D-A</b>
<p>Displays the results of the last disruptive selftest of the DSL card. This selftest is only performed on power up of the system or a reset of the card. Each subsystem (processors, memory, and interfaces) reports pass or fail. If all subsystems pass, the card has passed selftest. If a subsystem fails, reset or replace the card.</p> <p>You can determine when the selftest occurred by reading the elapsed time since the last reset on the card.</p>	
<b>Alarms (Card Alarms)</b>	<b>D-B</b>
<p>Displays all active card alarm conditions. Major alarms include Selftest failure, Processor failure (sanity timer), and DSL or Ethernet port failures. Minor alarms include Config Error (configuration has been corrupted) and threshold exceed for DSL margin or Link Down events.</p>	
<b>DSL Packet Echo Test</b>	<b>D-C</b>
<p>Gives the user the ability to conduct a nondisruptive packet test between the DSL card and Hotwire SN endpoint. Test packets are sent to the SN at 10 percent of the line rate and echoed back to this card, where they are counted and checked for errors. The running time of the test can be specified and the test will continue until the specified time has elapsed or the test is stopped.</p> <p>Results include packets sent, valid packets received, errored packets received, errored seconds, and elapsed time of the test.</p> <p>NOTE: You can specify the DSL port number but only one port can be entered at a time.</p>	
<b>SN Selftest</b>	<b>D-D</b>
<p>Gives the user the ability to perform a power-on SN selftest. A port number can be selected to perform the test.</p> <p>NOTE: Entering yes in the Reset SN field will temporarily disrupt the data path on the specified DSL port while the SN resets.</p>	

## Troubleshooting

The status of each card in the Hotwire DSLAM is indicated on the Card Selection screen (see Chapter 2, *Hotwire Menus and Screens*). Choose Card Selection from the Hotwire Chassis Main Menu.

The status of each DSL card is indicated by codes being displayed in any of eight positions to the right of the card selected. For example, if you select DSL card in Slot 4, the following may be displayed:

```

4: 8510  _ M R U  U  U X X
Pos:      1 2 3 4  5 6 7 8

```

This display shows the following:

- There is an 8510 card in Slot 4
- Position 1 – no current test ( \_ )
- Position 2 – major alarm is present (M)
- Position 3 – minor alarm is present (R)
- Position 4 – Ethernet link is up (U)
- Positions 5 and 6 – DSL ports 1 and 2 are up (U)
- Positions 7 and 8 – DSL ports 3 and 4 are disabled (X)

The following table explains the codes by position.

Position	Display	Description
	<card type>	MCC
1	T (Test mode)	Card currently in test mode
2	M (Major alarm)	Major alarm present on card
3	R (Minor alarm)	Minor alarm present on card
4	e (Ethernet)	Status of Ethernet link (U=UP, D=Down, X=Disabled)
5	d1 (DSL)*	Status of DSL card Port 1 (U=UP, D=Down, X=Disabled, or H=Handshaking)
6	d2 (DSL)*	Status of DSL card Port 2 (U=UP, D=Down, X=Disabled, or H=Handshaking)
7	d3 (DSL)*	Status of DSL card Port 3 (U=UP, D=Down, X=Disabled, or H=Handshaking)
8	d4 (DSL)*	Status of DSL card Port 4 (U=UP, D=Down, X=Disabled, or H=Handshaking)
9	w1 (WAN)*	Status of WAN link Port 1 (U=Up, D=Down, L=Loopback)
–	w2 (WAN)*	Status of WAN link Port 2 (U=Up, D=Down, L=Loopback)
–	w3 (WAN)*	Status of WAN link Port 3 (U=Up, D=Down, L=Loopback)
–	w4 (WAN)*	Status of WAN link Port 4 (U=Up, D=Down, L=Loopback)
* Not used for MCC cards.		

## Checking Alarms

If the Card Selection screen indicates that a Major or Minor Alarm is on a card, follow the menu sequence *Diagnostics* → *Alarms (D-B)* to determine the cause of the alarm.

### NOTE:

If a DSL card does not appear on the Card Selection screen because the MCC card can no longer communicate with it, the MCC card will generate a major alarm. You should go to the MCC's *Monitor* → *Card Status* → *Syslog (A-A-C)* and view the event on its system log.

## Major Alarms

Use Table 7-2 to determine the appropriate action to take for each Major Alarm.

**Table 7-2. Major Alarms (1 of 2)**

Failure Type	Action
<b>Selftest failure</b>	<ol style="list-style-type: none"> <li>1. Check the Selftest Results display by following the menu sequence: <i>Diagnostics</i> → <i>Selftest</i>.</li> <li>2. Do another Selftest (Reset) and check results. <ul style="list-style-type: none"> <li>– If the results are normal, the problem was transient. Log the results.</li> <li>– If the results are the same as the first selftest, the card should be replaced. If only one port on a DSL card is bad, that port can be disabled. You may continue to use the card until it is convenient to replace it.</li> </ul> </li> </ol>
<b>Processor failure (Sanity timer)</b>	<ol style="list-style-type: none"> <li>1. Check the Selftest Results display by following the menu sequence: <i>Diagnostics</i> → <i>Selftest</i>.</li> <li>2. Do another Selftest (Reset) and check results. <ul style="list-style-type: none"> <li>– If the results are normal, the problem was transient. Log the results.</li> <li>– If the results are the same as the first selftest, the card should be replaced.</li> </ul> </li> </ol>

Table 7-2. Major Alarms (2 of 2)

Failure Type	Action
<b>Ethernet port failure</b>	<ol style="list-style-type: none"> <li>1. Check cable connections to the DSLAM. <ul style="list-style-type: none"> <li>– If cables are terminated properly, go to Step 2.</li> <li>– If cables are not terminated properly, terminate them correctly.</li> </ul> </li> <li>2. Check cable connections to the Hub or Ethernet switch. <ul style="list-style-type: none"> <li>– If cables are terminated properly, go to Step 3.</li> <li>– If cables are not terminated properly, terminate them correctly.</li> </ul> </li> <li>3. Check the Activity/Status LED at the Ethernet Hub or Switch. <ul style="list-style-type: none"> <li>– If Activity/Status LED does not indicate a problem, go to Step 4.</li> <li>– If Activity/Status LED indicates a problem, take appropriate action.</li> </ul> </li> <li>4. Disconnect the Ethernet cable and replace it with a working cable from a spare port on the Hub. <ul style="list-style-type: none"> <li>– If the replacement cable works, the original is bad and should be permanently replaced.</li> <li>– If the replacement cable does not work, reconnect the original cable and go to Step 5.</li> </ul> </li> <li>5. Move the DSL card and cable to another (spare) slot. <ul style="list-style-type: none"> <li>– If this solves the problem, the connector or interface panel connections for the original slot are bad. Schedule maintenance for the chassis and try to use the spare slot temporarily.</li> <li>– If this does not solve the problem, the DSL card is probably bad and should be replaced.</li> </ul> </li> </ol>
<b>DSL port failure</b>	<ol style="list-style-type: none"> <li>1. Check the Selftest Results display by following the menu sequence: <i>Diagnostics</i> → <i>Selftest</i>.</li> <li>2. Do another Selftest (Reset) and check results. <ul style="list-style-type: none"> <li>– If the results are normal, the problem was transient. Log the results.</li> <li>– If the results are the same as the first selftest, the card should be replaced. If only one port on a DSL card is bad, that port can be disabled. You may continue to use the card until it is convenient to replace it.</li> </ul> </li> </ol>
<b>DSL card not responding</b> (LEDs on card are out or MCC is showing an alarm.)	<ol style="list-style-type: none"> <li>1. Check to see if the lights are out on the card. <ul style="list-style-type: none"> <li>– Plug the card into an empty slot to see if it responds. If not, the card is bad and needs to be replaced.</li> <li>– If the card responds in a different slot, the slot connector may be bad. Call your service representative.</li> </ul> </li> <li>2. Check to see if the lights are on, but not responding. <ul style="list-style-type: none"> <li>– Pull the card out and plug it in again.</li> <li>– Reset the card from the MCC or DSL Main Menu.</li> <li>– Go to the MCC Main Menu and clear NVRAM.</li> <li>– Replace the card.</li> </ul> </li> </ol>

## Minor Alarms

Use Table 7-3 to determine the appropriate action to take for each Minor Alarm.

**Table 7-3. Minor Alarms (1 of 2)**

Failure Type	Action
<b>Config Error</b>	<ol style="list-style-type: none"> <li>1. Check the Selftest Results display by following the menu sequence: <i>Diagnostics</i> → <i>Selftest</i>.</li> <li>2. Do another Selftest (Reset) and check results. <ul style="list-style-type: none"> <li>– If the results are normal, the problem was transient. Log the results.</li> <li>– If Selftest results still show configuration corruption, there is a card problem. The card's nonvolatile RAM should be erased and the configuration reentered. Perform a configuration download.</li> <li>– If the configuration has not been saved, use reset and erase NVRAM to force the card to the factory default. Enter the basic default route to the MCC and reconfigure the card manually.</li> </ul> </li> </ol>
<p>NOTE: The following are minor alarms where thresholds have been exceeded and are primarily indications of degraded quality on the DSL loop. They are not necessarily related to problems with the DSL card.</p>	
<b>Margin Threshold</b> (A trap message is sent if margin falls below selected value.)	<ul style="list-style-type: none"> <li>■ If DSL speed is set to a Fixed Rate, you may choose to lower the speed in the direction indicated by the threshold alarm (Fixed Up Speed or Fixed Down Speed) to get a better Margin and improved error performance.</li> <li>■ If DSL speed is set to Rate Adaptive and the Margin Threshold is &gt; 0, then this alarm is a warning that the loop has degraded. The actual bit rate should still be above <math>10^{-7}</math>. This condition may be temporary due to high temperature or humidity/rain, or it may be permanent due to high noise from additional digital circuits installed in the same cable bundle.</li> <li>■ If DSL speed is set to Rate Adaptive and the Margin Threshold is &lt; 0, then this alarm is a warning that the loop has seriously degraded. The actual bit rate may be below <math>10^{-7}</math>. This condition may be temporary or permanent. However, if it persists, the loop may have to be reengineered for better performance by performing one of the following: <ul style="list-style-type: none"> <li>– Remove bridge taps</li> <li>– Change cable gauge on a cable section</li> <li>– Run new cable</li> <li>– Remove other noise-generating digital circuits from the cable bundle</li> </ul> </li> </ul>



Table 7-3. Minor Alarms (2 of 2)

Failure Type	Action
<p><b>Link Down Threshold</b> (A trap message is sent if the number of DSL link down events in 15 minutes exceeds the selected value.)</p>	<ul style="list-style-type: none"> <li>■ If the threshold is set low (1–4), and the link is currently down, then there may be a loop or SN problem. Check both. <ul style="list-style-type: none"> <li>– Verify that the SN is powered up, is connected to the loop, and has passed its Selftest.</li> <li>– Check the loop for continuity</li> </ul> </li> <li>■ If the threshold is set low (1–4), and the link is currently up, then an event had occurred to temporarily knock out the connection. Log the event and continue normal operation.</li> <li>■ If the threshold is set high (&gt; 4), and the link is currently down, then check the Margin statistics over the past hour and day. If the numbers are low, there may be a situation where the DSL modems cannot train. This condition may be temporary or permanent. However, if it persists, the loop may have to be reengineered for better performance by performing one of the following: <ul style="list-style-type: none"> <li>– Remove bridge taps</li> <li>– Change cable gauge on a cable section</li> <li>– Run new cable</li> <li>– Remove other noise-generating digital circuits from the cable bundle</li> </ul> </li> <li>■ If the threshold is set high (&gt; 4) and the link is currently up, then there may be a loose connection in the loop plant, or the loop is barely usable. Check the Margin. If the Margin is normal, there may be a loose connection. If the Margin is low, try reducing the speed of the DSL port.</li> </ul>

## Network Problems

Review the following symptoms and possible solutions to help in solving any problems you may encounter on the Hotwire DSLAM.

**PROBLEM:** Intranetworking communication problems.

- ACTION:**
1. Verify that the internetworking network cables meet IEEE standards for local Ethernet networks.
  2. Check cable connections to DSLAM and other devices in the network.
  3. Determine whether or not your system is the only one in the network with a problem.

## Slow Performance

**PROBLEM:** Performance is slow.

- ACTION:**
1. Check the Ethernet Statistics screen for excessive Cycle Redundancy Check (CRC) errors, a bad connection, or a bad cable (see *DSL Monitoring Physical Layer Screens* in Chapter 6, *Monitoring the Hotwire DSLAM*).

## Excessive Collisions

**PROBLEM:** Excessive collisions on an Ethernet port.

- ACTION:**
1. Determine if your network is too large or long (single Ethernet cable or end-to-end cable).
  2. Check to see if there are too many repeaters.
  3. Check to see if there are too many users on a single Ethernet.

## No Response at Startup

**PROBLEM:** DSL cards do not respond at startup after rebooting chassis.

**ACTION:**

1. Reset the MCC card.
2. Be sure LEDs go through the reset sequence once. Then, a second time after 15–20 seconds.

## Cannot Upload Configurations to a Unix Server

**PROBLEM:** TFTP server denies write permission (Message is “TFTP recv failure”).

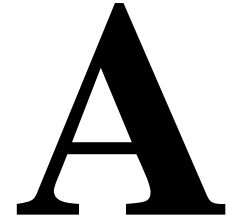
**ACTION:**

1. Before uploading configurations, create a dummy file and give it global Read-Write permissions.
2. Configure TFTP host to have Write permissions is specified directory.



---

# Download Code and Apply Download



---

The Download Code menu option on the Hotwire DSLAM gives you the ability to upgrade your software with a new version of code and then apply this code to your system.

The screenshot shows a terminal window titled "Download Code" with a tab labeled "<no name>". The interface includes a text input field for "Image File Name:" which is currently empty. Below this, the "TFTP Server IP Address:" is set to "0.0.0.0". The "Start Transfer:" option is set to "no". A status section shows "Packets Sent:" and "Packets Received:" both at "00000", and "Bytes Sent:" and "Bytes Received:" both at "00000". The "Transfer Status:" field is empty. At the bottom, there is a prompt "Enter File Name:" followed by a cursor, and a footer line that reads "Hotwire 8600: DSL01: 8510: \_ M \_ D X X X X".

New firmware releases are typically applied to either the MCC or DSL cards in your system. When a software upgrade affects both the MCC and the DSL cards, you must download and apply a new version of code into each of the DSL cards **before** you download and apply a new version of code into the MCC.

## TFTP Server Configuration

When you are downloading code to an endpoint, configure your TFTP server with the following timeout values:

- **Retransmission timeout** – Value not less than 10 seconds.
- **Total transmission** – Value not less than three times the retransmission timeout.

You may also use the above values for a standard TFTP transfer.

### NOTE:

Before initiating a download, verify that you can Ping to the TFTP server. If you can not, do not proceed with the download. Also, make certain that the files that you are going to download from exist in the system.

## Download Code

When you are attempting to download to the DSL cards, refer to Table 5-1, **Card Status Options**, in Chapter 5, *8310 MVL and 8510 DSL Card Configuration*. In general, the following describes what to expect when you have initiated a download from the configuration menu.

From the DSL Configuration Main Menu, select

*Configuration* → *Card Status* → *Download Code (A-A-F)*.

This selection brings you to the Download submenu. Select Download Code.

### NOTE:

To download code to the Service Node(s), you must use the MCC download menu. For information on this and other methods used to download firmware to the DSL and MVL cards, see Chapter 4, *Configuration Options*, in the *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.

## Fully Functional System: Deferred Apply

Enter the path and image file name and the TFTP Server IP address. Select yes to begin the file transfer. When you are downloading the new firmware, this does not impact service or the operation of the system. Depending on the network traffic, this download may take a minimum of 10 minutes. You may apply the newly acquired firmware load at any time following the successful transfer.

### CAUTION:

**When the download is completed, if you elect to apply the code, service will be disrupted while the card restarts and the new code is installed.**

### **Download Only System: Automatic Immediate Apply**

In order for the system to become fully functional again, you **must** start the Download Code file transfer procedure. Enter the image file name and the TFTP Service IP address. Select yes to begin the file transfer. When the file transfer has successfully completed, the system will automatically restart and become fully functional with the newly acquired firmware.

### **Apply Download**

From the DSL Configuration Main Menu, select

*Configuration → Card Status → Download Code (A-A-F).*

This selection brings you to the Download submenu. Select Apply Code.





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# Traps

# B

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Traps are configured via a Telnet or terminal session. The addition or removal of a card or another hardware component within the Hotwire DSLAM system causes a trap to be generated. These traps indicate a configuration change notification (CCN) of a card (a hardware replacement or a software upgrade).

## DSL Card Traps

The DSL card sends the following traps.

Event	Trap Class	Comment	Trap # – MIB *
Device failure	major	AN's operating software has detected an internal device failure.	15-sys
Selftest failure	minor	Sent if any portion of the AN's restart/selftest fails.	16-sys
CCN (Configuration Change Notice)	warning	Configuration change caused by one the following events: <ul style="list-style-type: none"><li>■ software download</li><li>■ configuration download</li><li>■ card removed (objective)</li></ul>	7-sys

\* MII = MIB II, ent = Entity MIB, dsl = hotDSL Enterprise MIB, sys = hotSys Enterprise MIB, dhcp = DHCP Enterprise MIB, diag = hot\_diag.mib

Event	Trap Class	Comment	Trap # – MIB *
CCN (Configuration Change Notice)	warning	Configuration change caused by one the following events: <ul style="list-style-type: none"> <li>■ change affecting the entity MIB</li> </ul>	1–ent
xDSL link up or down Transitions threshold exceeded	minor	Number of link down events above threshold. This rate is limited to once every 15 minutes.	1–dsl
xDSL port speed low	warning	Port speeds decreased to lower bound thresholds.	2–dsl
xDSL port speed normal	normal	Port speed now above lower bound threshold.	102–dsl
Ethernet link down	major	—	2–MII
Ethernet link up	normal	—	3–MII
xDSL margin low	minor	Margin estimate below customer set threshold.	3–dsl
xDSL margin normal	normal	Margin estimate now above customer set threshold.	103–dsl
xDSL port failure	major	Processor detected bad DSL modem chip set.	5–dsl
xDSL port operational	normal	Processor can now communicate with DSL modem chip set.	105–dsl
xDSL SN selftest fail	warning	Self test failure from an SN.	19–dsl
Configuration download failure	warning	Configuration download has failed.	2–diag
Cold start	warning	Card has been reset and performed a cold start.	0–MII
Warm start	warning	Power on reset.	1–MII
* MII = MIB II, ent = Entity MIB, dsl = hotDSL Enterprise MIB, sys = hotSys Enterprise MIB, dhcp = DHCP Enterprise MIB, diag = hot_diag.mib			

Event	Trap Class	Comment	Trap # – MIB *
xDSL test start	normal	Test started by any means.	6-dsl
xDSL test clear	normal	Test over.	106-dsl
DHCP filter security failure	minor	Can not add new route to route table because maximum number of stored rules reached.	11-dhcp
SN device mismatch	minor	SN identified on port <i>N</i> does not match device described in port configuration role.	07-dsl
SN device mismatch clear	minor	SN identified on port <i>N</i> now matches device described in port configuration table.	107-dsl
SN loss of power	minor	Card received "last gasp" message from SN, followed by a link down condition one minute later.	17-dsl
SN device failure	major	Operating software has detected an internal device failure. The SN is still operating.	18-dsl
SN selftest failure	minor	Failure of the SN's hardware components. This trap is only sent if the hardware failure still allows sending traps.	19-dsl
SN fatal reset	---	Variable binding field contains device failure code.	20-dsl
Dynamic filter injection failure	warning	Cannot inject or delete dynamic filters to SN on port <i>N</i> .	10-dhcp
* MII = MIB II, ent = Entity MIB, dsl = hotDSL Enterprise MIB, sys = hotSys Enterprise MIB, dhcp = DHCP Enterprise MIB, diag = hot_diag.mib			



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# Glossary

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<b>10BaseT</b>	A 10-Mbps Ethernet LAN that works on twisted-pair wiring.
<b>address</b>	A symbol (usually numeric) that identifies the interface attached to a network.
<b>ARP</b>	Address Resolution Protocol. Part of the TCP/IP suite, ARP dynamically links an IP address with a physical hardware address.
<b>authentication server</b>	An authentication server can either be a RADIUS server or an XTACACS server and can be used to confirm an end-user system's access location.
<b>backplane</b>	A common bus at the rear of a nest or chassis that provides communications and power to circuit card slots.
<b>bandwidth</b>	The range of frequencies that can be passed by a transmission medium, or the range of electrical frequencies a device is capable of handling.
<b>BootP</b>	Bootstrap Protocol. Described in RFCs951 and 1084, it is used for booting diskless nodes.
<b>bps</b>	Bits per second. Bits per second. Indicates the speed at which bits are transmitted across a data connection.
<b>byte</b>	A sequence of successive bits (usually eight) handled as a unit in data transmission.
<b>CAP</b>	Carrierless Amplitude Modulation and Phase Modulation. A transmission technology for implementing a Digital Subscriber Line (DSL). The transmit and receive signals are modulated into two wide-frequency bands using passband modulation techniques.
<b>central office</b>	CO. The PSTN facility that houses one or more switches serving local telephone subscribers.
<b>Community name</b>	An identification used by an SNMP manager to grant an SNMP server access rights to MIB.
<b>default route</b>	The address used for routing packets whose destination is not in the routing table. In Routing Information Protocol (RIP), this is IP address 0.0.0.0.
<b>DHCP</b>	Dynamic Host Configuration Protocol. A Microsoft protocol for dynamically allocating IP addresses.
<b>DHCP Relay Agent</b>	A system that detects and forwards DHCP discover or request messages to the appropriate DHCP server.
<b>DHCP Server</b>	A server which uses DHCP to allocate network addresses and deliver configuration parameters to dynamically configured hosts.
<b>domain</b>	A block of IP addresses. Syntactically, all IP addresses within a given domain would share a common IP address prefix of some length.
<b>downstream</b>	In the direction of the customer premises.
<b>DSL</b>	Digital Subscriber Line. DSL is a copper loop transmission technology enabling high-speed access in the local loop.
<b>DSL card</b>	Digital Subscriber Line Card. The primary card in the Hotwire DSLAM system. It has one Ethernet port and four DSL ports.
<b>DSLAM</b>	Digital Subscriber Line Access Multiplexer. DSLAM provides simultaneous high-speed digital data access and analog POTS over the same twisted-pair telephone line.

<b>e1a</b>	Name of the DSL card's and MCC card's 10BaseT (Ethernet) interface.
<b>Ethernet</b>	A type of network that supports high-speed communication among systems. It is a widely-implemented standard for LANs. All hosts are connected to a coaxial cable where they contend for network access using a Carrier Sense, Multiple Access with Collision Detection (CSMA/CD) paradigm.
<b>Ethernet address</b>	A six-part hexadecimal number in which a colon separates each part (for example, 8:0:20:1:2f:0). This number identifies the Ethernet communications board installed in a PC and is used to identify the PC as a member of the network.
<b>filter</b>	A rule or set of rules applied to a specific interface to indicate whether a packet can be forwarded or discarded.
<b>FTP</b>	File Transfer Protocol. A TCP/IP standard protocol that allows a user on one host to access and transfer files to and from another host over a network, provided that the client supplies a login identifier and password to the server.
<b>gateway address</b>	The subnet that the end-user system is on.
<b>host</b>	A computer attached to a network that shares its information and devices with the rest of the network.
<b>host routes</b>	An IP address having a subnet mask of 255.255.255.255.
<b>HDLC</b>	High-Level Data Link Control. A communications protocol defined by the International Standards Organization (ISO).
<b>ICMP</b>	Internet Control Message Protocol. An Internet protocol that allows for the generation of error messages, test packets, and information messages related to IP.
<b>Internet</b>	The worldwide internetwork that predominantly uses the TCP/IP protocol.
<b>intranet</b>	A private network or internet using Internet standards and software, but protected from public access.
<b>IP</b>	Internet Protocol. An open networking protocol used for internet packet delivery.
<b>IP Address</b>	Internet Protocol Address. The address assigned to an Internet host.
<b>ISP</b>	Internet Service Provider. A vendor who provides direct access to the Internet.
<b>LAN</b>	Local Area Network. A privately owned and administered data communications network limited to a small geographic area.
<b>MAC</b>	Media Access Control. The lower of the two sublayers of the data link layer, the MAC sublayer controls access to shared media.
<b>MAC Address</b>	Media Access Control Address. The unique fixed address of a piece of hardware, normally set at the time of manufacture, and used in LAN protocols.
<b>margin (DSL)</b>	The additional noise, measured in dB, that would need to be added to the existing noise on a given DSL loop to bring the Bit Error Rate to $10^{-7}$ .
<b>MCC Card</b>	Management Communications Controller Card. The DSLAM circuit card used to configure and monitor the DSLAM.
<b>MIB</b>	Management Information Base. A database of managed objects used by SNMP to provide network management information and device control.
<b>NAP</b>	Network Access Provider. The provider of the physical network that permits connection of service subscribers to NSPs.
<b>NHR</b>	Next Hop Router. The next router IP address to any given destination.

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<b>NMS</b>	Network Management System. A computer system used for monitoring and controlling network devices.
<b>NSP</b>	Network Service Provider. A local telephone company or ISP that provides network services to subscribers.
<b>packet</b>	A group of control and data characters that are switched as a unit within a communications network.
<b>PING</b>	An IP-based application used to test reachability of destinations by sending an ICMP echo request and waiting for a reply. The ping program is supported from both the DSL and MCC cards.
<b>POTS</b>	Plain Old Telephone Service. Standard telephone service over the PSTN with an analog bandwidth of less than 4 Hz.
<b>POTS Splitter</b>	A device that filters out the DSL signal and allows the POTS frequencies to pass through.
<b>PPP</b>	Point-to-Point Protocol. as specified by Internet RFC 1661.
<b>proxy ARP</b>	Proxy Address Resolution Protocol (ARP). A technique for using a single IP address for multiple networks. A device responds to ARP requests with its own physical address, then routes packets to the proper recipients.
<b>Router</b>	A device that connects LANs by dynamically routing data according to destination and available routes.
<b>Routing Table</b>	A table used by a node to route traffic to another node in the multiplexer network.
<b>RTU</b>	Remote Termination Unit. A DSL device installed at the customer premises.
<b>s1c</b>	Interface name of a DSL card's DSL port #1.
<b>s1d</b>	Interface name of a DSL card's DSL port #2.
<b>s1e</b>	Interface name of a DSL card's DSL port #3.
<b>s1f</b>	Interface name of a DSL card's DSL port #4.
<b>Service Node</b>	Endpoint modem at the customer premise, also known as a Remote Termination Unit (RTU). There are two model types. See RADSL and MVL.
<b>SNMP</b>	Simple Network Management Protocol. Protocol for open networking management.
<b>SNMP agent</b>	An application level program that facilitates communication between an SNMP management system and a device. See NMS.
<b>SNMP trap</b>	A message sent to an SNMP manager to notify it of an event, such as a device being reset.
<b>static route</b>	A user-specified permanent entry into the routing table that takes precedence over routes chosen by dynamic routing protocols.
<b>subnet address</b>	The subnet portion of an IP address. In a subnetted network, the host portion of an IP address is split into a subnet portion and a host portion using an address (subnet) mask. This allows a site to use a single IP network address for multiple physical networks.
<b>subnet mask</b>	A number that identifies the subnet portion of a network address. The subnet mask is a 32-bit Internet address written in dotted-decimal notation with all the 1s in the network and subnet portions of the address.
<b>TCP</b>	Transmission Control Protocol. An Internet standard transport layer protocol defined in STD 7, RFC 793. It is connection-oriented and stream-oriented.

<b>Telnet</b>	Virtual terminal protocol in the Internet suite of protocols. Allows the user of one host computer to log into a remote host computer and interact as a normal terminal user for that host.
<b>terminal emulation</b>	Software that allows a PC to mimic the signals of a specific type of terminal, such as a VT100 or 3270, to communicate with a device requiring that terminal interface.
<b>TFTP</b>	Trivial File Transfer Protocol. A standard TCP/IP protocol that allows simple file transfer to and from a remote system without directory or file listing. TFTP is used when FTP is not available.
<b>TraceRoute</b>	A program that lists the hosts in the path to a specified destination.
<b>upstream</b>	In the direction of the telephone network.
<b>XTACACS</b>	See Authentication Server.



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