MODEL 7112 T1 DSU/CSU

WITH INTERNAL ETHERNET LAN ADAPTER

USER'S GUIDE

Document No. 7112-A2-GB20-20

March 1998

PARADYNE™

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About This Guide

Document Purpose and Intended Audience

This guide contains information needed to set up, configure, and operate the Model 7112 T1 DSU/CSU and is intended for use by installers and operators.

Document Summary

Section	Description
Chapter 1	*About the T1 DSU/CSU.* Describes the DSU/CSU features and SNMP management capabilities with a typical configuration example.
Chapter 2	*Using the ASCII Terminal Interface.* Provides instructions for accessing the user interface and navigating the screens.
Chapter 3	*Configuring the DSU/CSU.* Provides procedures for setting up the user interface, and DSU/CSU configuration steps.
Chapter 4	*Security.* Presents procedures for creating a login, setting the effective access levels, and controlling SNMP access.
Chapter 5	*IP Addressing.* Provides details regarding IP addresses with examples.
Chapter 6	*Monitoring the DSU/CSU.* Describes monitoring details about the LEDs, DSU/CSU status, and network statistics.
Chapter 7	*Testing.* Provides details about available tests and test setup.
Chapter 8	*Messages and Troubleshooting.* Provides information on SNMP traps, device messages, and troubleshooting.

Section	Description
Appendix A	*Configuration Option Tables.* Contains all configuration options, default settings, and possible settings.
Appendix B	*Worksheets.* Contains all the configuration options, default settings, and possible settings to use for planning.
Appendix C	*MIB Descriptions.* Provides all MIBs supported by the DSU/CSU.
Appendix D	*Standards Compliance for SNMP Traps.* Contains SNMP trap compliance details.
Appendix E	*Cables and Pin Assignments.* Contains connector and interface details.
Appendix F	*Technical Specifications.* Contains physical and regulatory specifications, network and port interfaces, power consumption values, etc.
Glossary	Defines acronyms and terms used in this document.
Index	Lists key terms, acronyms, concepts, and sections in alphabetical order.

Product-Related Documents

Document Number	Document Title
7112-A2-GN10	*Model 7112 T1 DSU/CSU with Internal Ethernet LAN Adapter Startup Instructions*

Contact your sales or service representative to order additional product documentation.

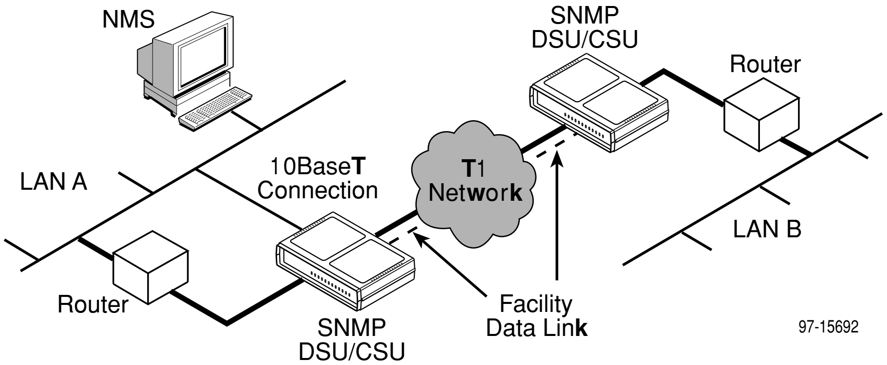
Paradyne documents are also available on the World Wide Web at:

http://www.paradyne.com
Select *Service & Support* → *Technical Manuals*

About the T1 DSU/CSU

1

Model 7112 T1 DSU/CSU Features



The 7112 T1 DSU/CSU provides an interface between the T1 digital network and the customer premises equipment, converting signals received from the DTE (Data Terminal Equipment) to bipolar signals that can be transmitted over T1 lines.

The T1 DSU/CSU offers these features:

- **10BaseT Port.** Allows the DSU/CSU to connect directly to an Ethernet LAN.
- **SNMP (Simple Network Management Protocol) Management.** Provides network management via an industry-standard SNMP management system.
- **Facility Data Link (FDL).** Provides remote management via SNMP or Telnet session capability over the T1 network.
- **ASCII Terminal Interface (ATI).** Provides a menu-driven VT100-compatible interface for configuring and managing the DSU/CSU locally or remotely by Telnet session or External Modem.
- **Two Customer-Specified Configuration Storage Areas.** Allows quick access to alternate sets of configuration options.

- **Management.** Provides management via:
  - — ASCII terminal connection through the Terminal port
  - — External modem through the Terminal port
  - — Telnet through the Ethernet port or the FDL
  - — SNMP through Ethernet port or the FDL
- **Alarm Indication.** Activates front panel LEDs.
- **Diagnostics.** Provides the capability to diagnose device and network problems and perform tests, including digital loopbacks, pattern tests, and self-test.
- **Device and Test Monitoring.** Provides the capability of tracking and evaluating the unit’s operation, including health and status, and error-rate monitoring.
- **Security.** Provides multiple levels of security, which deters unauthorized access to the DSU/CSU.

Typical DSU/CSU Configurations

Figures 1-1 and 1-2 show typical LAN/WAN interconnection applications for the DSU/CSU. The routers connected to the DSU/CSU at each location provide the LAN interconnection.

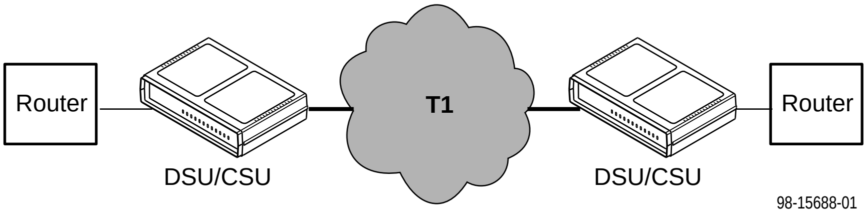


Figure 1-1. Typical Configuration (through a T1 network)

Two SNMP DSUs can be connected back-to-back to act as Local Area Data Sets.

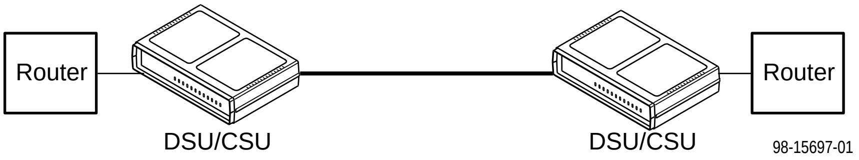


Figure 1-2. Typical Configuration (DSU/CSU to DSU/CSU)

User Interface Types

There are three types of user interfaces to the T1 DSU/CSU:

- Menu-driven ASCII terminal interface screens (see Chapter 2, *Using the ASCII Terminal Interface (ATI)*).
- SNMP NMS Access – Refer to *Model 7112 T1 DSU/CSU Features* on page 1-1. Provides the capability to access the DSU/CSU via an SNMP management system connected to the Ethernet port or remotely through the Facility Data Link (FDL). Refer to Chapter 5, *IP Addressing*.
- Front panel LED status indicators. Refer to Chapter 6, *Monitoring the DSU/CSU*.

Front Panel LED Status Indicators

Refer to Chapter 6, *Monitoring DSU/CSU LEDs*.

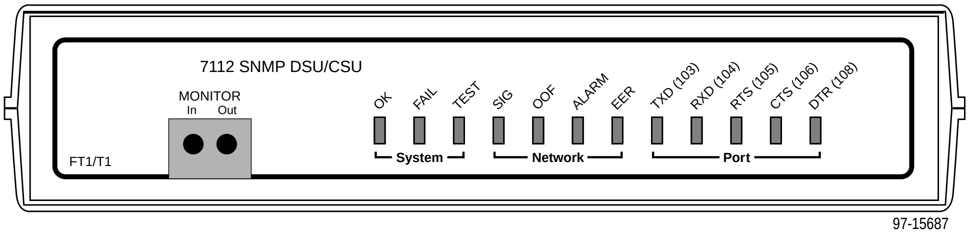


Figure 1-3. Model 7112 SNMP DSU/CSU Front Panel

Rear Panel Interface Connections

Figure 1-4 shows the physical interfaces of the DSU/CSU. Information about the installation of the DSU/CSU is contained in *Model 7112 T1 DSU/CSU with Internal Ethernet LAN Adapter Startup Instructions*.

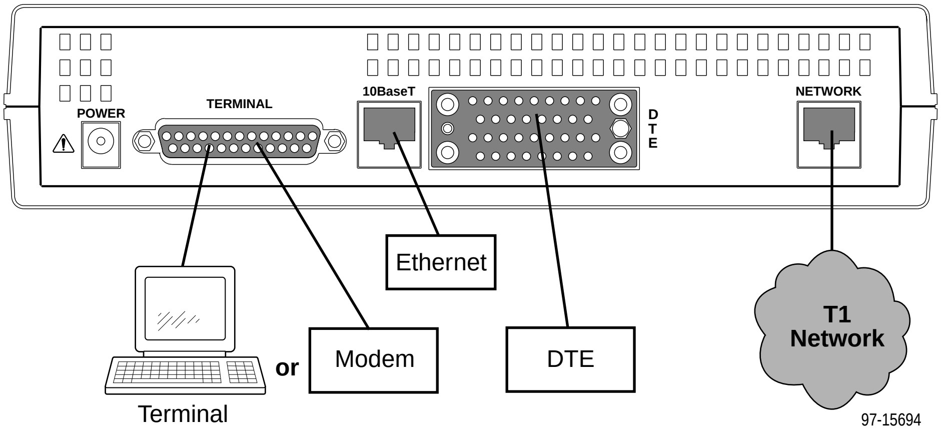


Figure 1-4. Rear Panel Connectors

CAUTION:

The 10BaseT and Network connectors are not keyed. Follow the installation procedures carefully to avoid connection errors.

SNMP Management Capabilities

The DSU/CSU supports SNMP Version 1, and has the capability of being managed by any industry-standard SNMP manager and accessed using SNMP protocol by external SNMP managers.

Management Information Base (MIB) Support

The following MIBs are supported:

- **MIB II (RFC 1213 and RFC 1573)** – Defines the general objects for use with a network management protocol in TCP/IP internets and provides general information about the DSU/CSU. MIB II is backward-compatible with MIB I.
- **Ethernet-like MIB (RFC 1643)** – Defines objects for managing Ethernet-like interfaces (e.g., 10BaseT).
- **RS-232-Like MIB (RFC 1659)** – Defines objects for managing RS-232-type interfaces and supports the V.35 synchronous data port on the DSU/CSU.
- **Enterprise MIB** – Supports configuration, status, statistics, and tests on the DS1 network interface.
- **DS1/E1 MIB (RFC1406)** – Defines objects for managing DS1 interfaces and supports the network interface on the DSU/CSU. DS1 Near End Group and DS1 Fractional Group are supported.
- **Generic-Interface Extension MIB (RFC 1229) (Generic Interface Test table only)** – Provides extensions to the generic interface group defined in MIB II.

Using the ASCII Terminal Interface (ATI)

2

Accessing the ATI

You can communicate with the ATI using one of the following methods:

- Direct connection through the Terminal port.
- Dialing in through an external modem to the Terminal port.
- Telnet session through the Ethernet port.
- Telnet session through the Facility Data Link (FDL).

NOTE:

Only one ATI session can be active at a time, and another user's session cannot be forced to end. To automatically log out a user due to inactivity, enable the Inactivity Timeout option (see Table A-6, Terminal Port Options and Table A-7, Telnet Session Options).

The user interface is blank until activated. Press Enter to activate the user interface. Security can limit ATI access several ways. To setup security or a login ID, refer to Chapter 4, *Security*.

Connecting to the Terminal Port

Ensure that the device you connect communicates using the following settings:

- Data rate set to 9.6 kbps.
- Character length set to 8.
- Parity set to None.
- Stop Bits set to 1.

To change Terminal port settings, refer to Table A-6, Terminal Port Options.

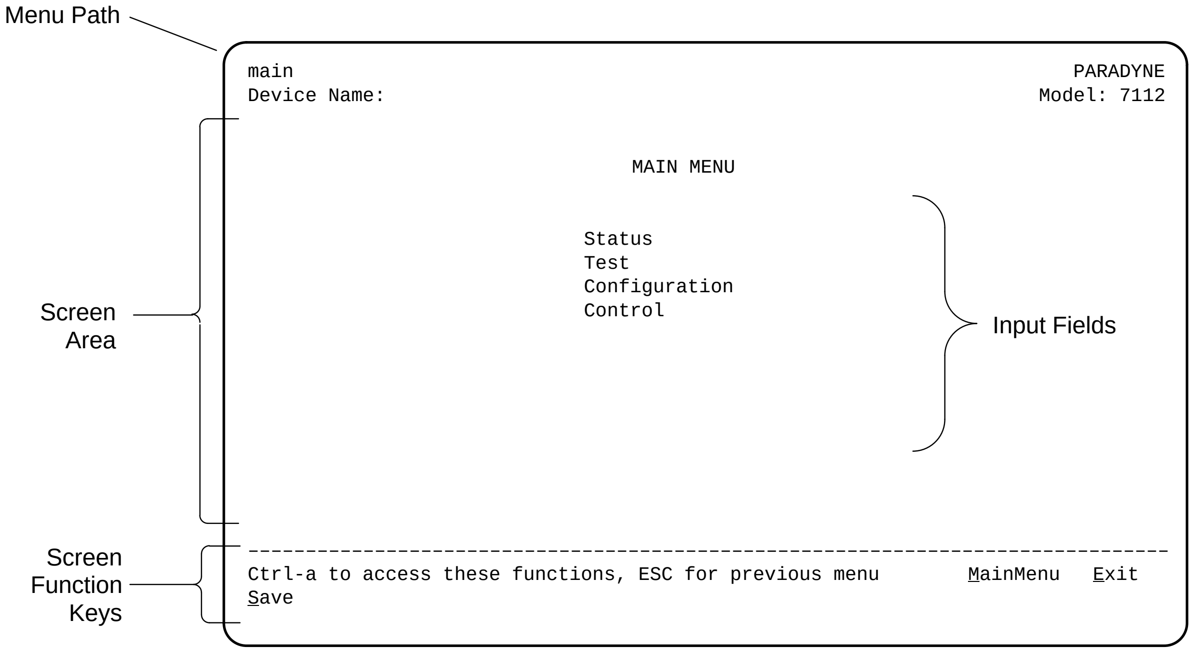
Initiating an ATI Session

The Main Menu screen is displayed on the screen unless a login ID and password is required or the ATI is already in use.

If security is enabled, the system prompts you for a login ID and password. After you enter a valid login ID and password, the Main menu appears. If you enter an invalid login ID and password after three attempts, the Telnet session closes or the terminal connection returns to an idle state. Refer to Chapter 4, *Security.*

If the ATI is already in use, you will see a "connection refused" or "connection failed" message (if you are using a Telnet session) or you will see the IP address of the other user (if you are using the Terminal port).

Entry to all of the DSU/CSU's tasks begins at the Main Menu screen.



```
main                                                                    PARADYNE
Device Name:                                                         Model: 7112


                                   MAIN MENU


                               Status
                               Test
                               Configuration
                               Control









--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu   Exit
Save
```

Select . . .	To . . .
Status	View system status, diagnostic test results, cross connections, statistics, and LEDs identity information.
Test	Select and cancel tests for the DSU/CSU's interfaces.
Configuration	Display and edit the configuration options.
Control	Control the user interface for device naming, login administration, or to initiate a power-up reset of the DSU/CSU.

Screen Work Areas

There are two user work areas:

- **Screen area** – Provides the menu path, access level, menus, and input fields above the dotted line.

  The menu path appears as the first line on the screen. In this manual, the menu path is presented as a menu selection sequence with the names of the screens For example:

  Main Menu → Configuration → Load Configuration From →
  Edit → Terminal Port

- **Screen function key area** – Provides functions available below the dotted line based upon screen selection and access level.

Screen Format Types

Three types of screen formats are available on the ATI.

Use the screen format . . .	**To . . .**
Menu selection	Display a list of available functions for user selection.
Input	Add or change information on a screen. Input or edit fields that have an Underline in the field value or selection. See *Screen Work Areas*.
Display	Display configuration information and results from performance and DSU/CSU-specific tests. Display-only fields that have no underline in the field value.

What Affects Screen Displays

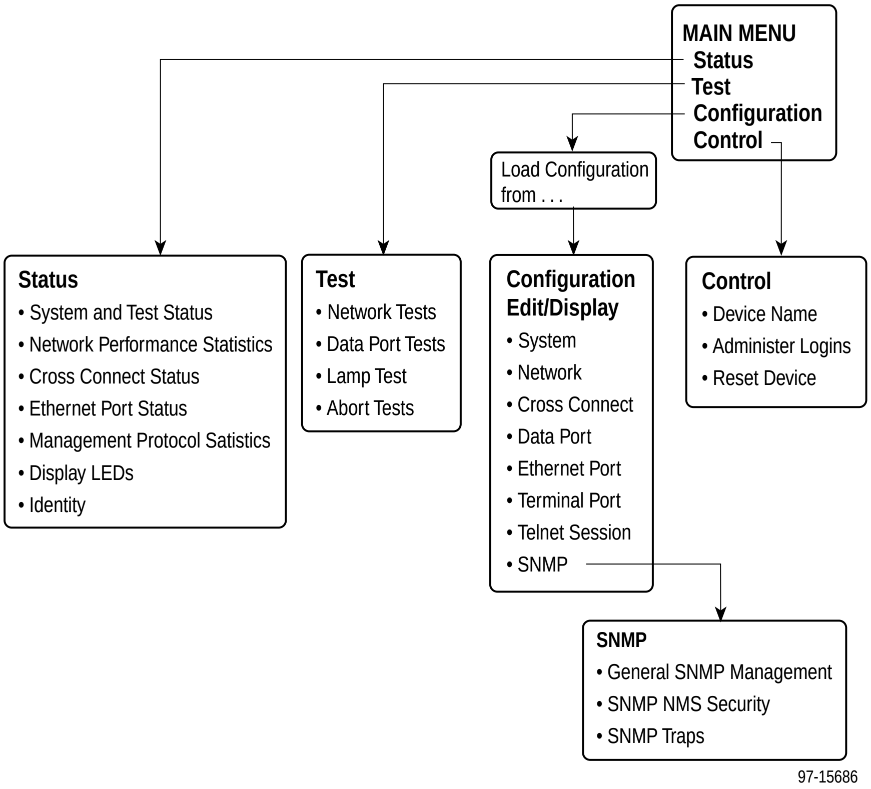
What appears on the screens depends on the:

- **Current configuration** – How your DSU/CSU is currently configured.
- **Effective security access level** – An access level that is typically set by the system administrator for each interface and each user.
- **Data selection criteria** – What you entered in previous screens.

Navigating

You can navigate the screens by:

- Using keyboard keys
- Using screen function keys
- Switching between the two screen work areas



Keyboard Keys

Use the following keyboard keys to navigate within the screen.

Press . . .	**To . . .**
Ctrl-a	Move cursor between the screen area and the screen function keys area below the dotted line at the bottom of the screen.
Esc	Return to the previous screen.
Tab	Move cursor to the next field on the screen.
Backspace	Move cursor to the previous field on the screen.

Press . . .	To . . .
Enter	Accept entry or display valid options on the last row of the screen when pressed before entering data or after entering invalid data.
Ctrl-k	Tab backwards (moves cursor one field to the left).
Spacebar	Select the next valid value for the field.
Delete (Del)	Delete character that the cursor is on.
Up Arrow or Ctrl-u	Move cursor up one field within a column on the same screen.
Down Arrow or Ctrl-d	Move cursor down one field within a column on the same screen.
Right Arrow or Ctrl-f	Move cursor one character to the right if in edit mode.
Left Arrow or Ctrl-b	Move cursor one character to the left if in edit mode.
Ctrl-l	Redraw the screen display, clearing information typed in but not yet entered.

▶ Procedure

To make a menu or field selection:

1. Press the tab key or the right arrow key to position the cursor on a menu or field selection. Each selection is highlighted as you press the key to move the cursor from position to position.
2. Press Enter. The selected menu or screen appears.
3. Continue Steps 1 and 2 until you reach the screen you want.

The current setting or value appears to the right of the field name. You can enter information into a selected field by:

- Typing in the first letter(s) of a field value or command, using the DSU/CSU’s character matching feature.
- Switching from the screen area to the screen function area below the dotted line and selecting or entering the designated screen function key.

If a field is blank and the Field Values screen area displays valid selections, press the spacebar and the first valid value for the field will appear. Continue pressing the spacebar to scroll through other valid values.

Screen Function Keys

All screen function keys located below the dotted line operate the same way (upper- or lowercase) throughout the screens.

For the screen function . . .	Select . . .	And press Enter to . . .
MainMenu	M or m	Return to the Main Menu screen.
Exit	E or e	Terminate the async terminal session.
New	N or n	Enter new data.
Delete	L or l	Delete data.
Save	S or s	Save information.
Refresh	R or r	Update screen with current information.
ClrStats	C or c	Clear network performance statistics and refresh the screen, Clear status messages for one-time events.
PgUp	U or u	Display the previous page.
PgDn	D or d	Display the next page.
ResetMon	R or r	Reset an active Monitor of active pattern test counter to zero.

Switching Between Screen Work Areas

Selecting Ctrl-a allows you to switch between the two screen work areas to perform all screen functions.

▶ Procedure

To access the screen function area below the dotted line:

1. Press Ctrl-a to switch from the screen area to the screen function key area below the dotted line. The available selections for the first input field appear on the last line as shown below.
2. Select either the function’s designated (underlined) character or press the tab key until you reach the desired function key.

   Example:
   To save the changes you have made on this screen, enter s or S (Save).
3. Press Enter.
4. To return to the screen area above the dotted line, press Ctrl-a again.

Ending an ATI Session

Use the Exit function key from any screen to terminate the session.

▶ Procedure

To end a session with the ASCII terminal interface:

1. Press Ctrl-a to go to the screen function key area below the dotted line.
2. Tab to Exit (or type e or E) and press Enter. The User Interface Idle screen appears.

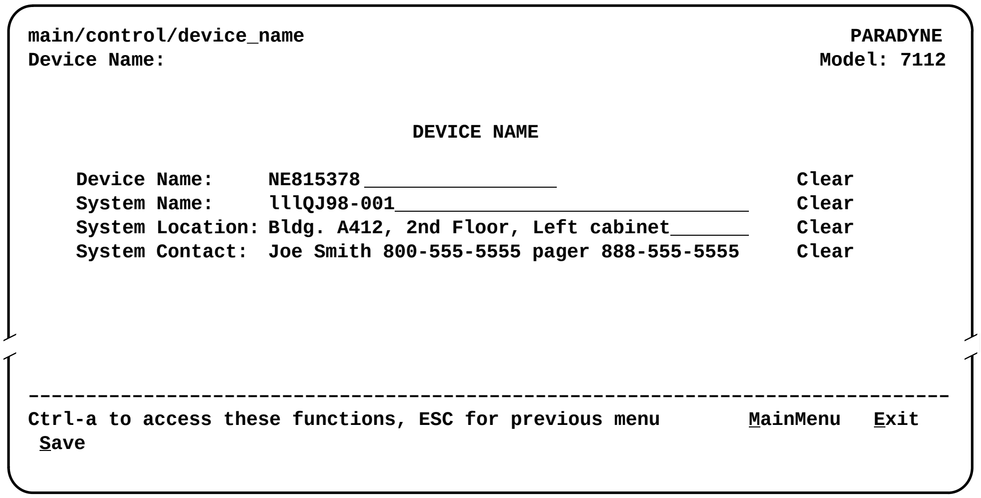
Configuring the DSU/CSU

3

Entering Device and System Information

Use the Device Name screen to determine the name that will be displayed at the top of all ATI screens, and SNMP system information that will be displayed on the Identity screen. To access the Device Name screen, follow this menu selection sequence:

Main Menu → Control → Device Name



```
main/control/device_name                                         PARADYNE
Device Name:                                                  Model: 7112


                              DEVICE NAME

    Device Name:     NE815378_________________                   Clear
    System Name:     lllQJ98-001_______________________________  Clear
    System Location: Bldg. A412, 2nd Floor, Left cabinet_______  Clear
    System Contact:  Joe Smith 800-555-5555 pager 888-555-5555   Clear



--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu      MainMenu   Exit
 Save
```

Fields on the Device Name screen are null until you enter values. Allowable values are any printable ASCII character except the ^ (caret).

Use the left and right arrow keys to scroll through the fields. Select Clear to reset a field to a null value.

▶ Procedure

To enter Device Name screen information:

1. Position the cursor in the Device Name field. Enter a name unique in your system to identify the unit.

   The maximum length of Device Name is 20 characters.

2. Position the cursor in the System Name field. Enter a name unique in your network to identify the system.

   The maximum length of System Name is 255 characters.

3. Position the cursor in the System Location field. Enter the physical location of the system.

   The maximum length of System Location is 255 characters.

4. Position the cursor in the System Contact field. Enter the name and contact information for the person responsible for the unit.

   The maximum length of System Contact is 255 characters.

5. Save the Device Name screen information.

Configuring the DSU/CSU

Configuration option settings determine how the DSU/CSU operates. Use the Configuration branch of the DSU/CSU menu to display or change configuration option settings.

Configuration Option Areas

The DSU/CSU is shipped with factory settings in all four strap areas. You can find default information by:

- Referring to Appendix A, *Configuration Option Tables* or Appendix B, *Worksheets*.
- Accessing the Default Factory Configuration branch of the DSU/CSU menu.

The DSU/CSU has four sets of configuration option settings. The Current Configuration matches the Default Factory Configuration until modified and saved by the user.

Configuration Option Area	**Configuration Option Set**
Current Configuration	The DSU/CSU's active set of configuration options.
Customer Configuration 1	Use to set up and store a set of configuration options for future use.
Customer Configuration 2	Use to set up and store a second set of configuration options for future use.
Default Factory Configuration	A read-only configuration area containing the factory default configuration options.

If the factory default settings do not support your network's configuration, you can customize the configuration options for your application.

Accessing and Displaying Configuration Options

To display the configuration options, you must first copy one configuration option set into the edit area.

▶ Procedure

To load a configuration option set into the configuration edit area:

1. Follow this menu selection sequence:

   Main Menu → Configuration (Load Configuration From)

2. Select the Current, Customer 1, Customer 2, or Default Factory Configuration and press Enter.

   The selected configuration option set is loaded and the Configuration Edit/Display menu screen appears.

See Appendix A for a list and explanation of the configuration options available.

Saving Configuration Options

When changes are made to the configuration options, the changes must be saved to take effect. The Save key and Save Configuration To screen appear when the user has an effective access level of 1. All other effective access levels have read-only permission.

▶ Procedure

To save configuration options changes:

1. Press Ctrl-a to switch to the screen function key area below the dotted line.
2. Select Save and press Enter. The Save Configuration To screen appears.
3. Select one of the three configuration option areas on the screen and press Enter. When Save is complete, Command Complete appears in the message area at the bottom of the screen.

NOTE:

When Exit is selected before Save, a Save Configuration screen appears requiring a Yes or No confirmation response.

If you select . . .	Then the . . .
Yes	Save Configuration To screen appears.
No	Main Menu appears and changes are not saved.

Assigning DS0 Channels to the Data Port

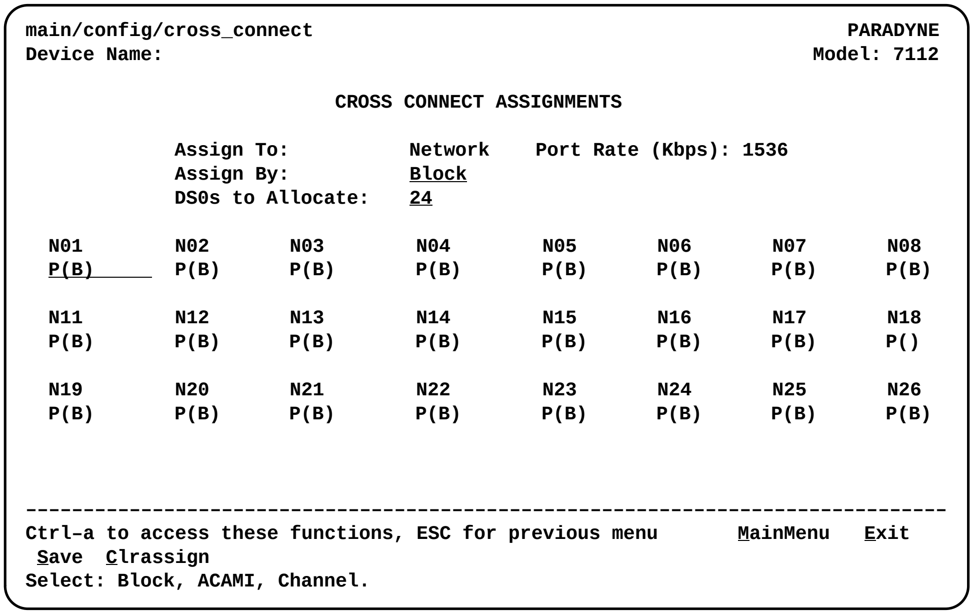
The DSU/CSU provides Cross Connect configuration options that allow you to do the following:

- Display network DS0 channels assigned to the data port.
- Allocate network DS0 channels to the data port.
- Clear (unassign) all DS0 channels from the data port interface.

The DSU/CSU's default configuration has all DS0 channels assigned to the data port.

To access the Cross Connect Assignments screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From →
Cross Connect



```
main/config/cross_connect                                            PARADYNE
Device Name:                                                      Model: 7112

                           CROSS CONNECT ASSIGNMENTS

             Assign To:          Network    Port Rate (Kbps): 1536
             Assign By:          Block
             DS0s to Allocate:   24

  N01        N02       N03        N04        N05       N06       N07       N08
  P(B)       P(B)      P(B)       P(B)       P(B)      P(B)      P(B)      P(B)

  N11        N12       N13        N14        N15       N16       N17       N18
  P(B)       P(B)      P(B)       P(B)       P(B)      P(B)      P(B)      P()

  N19        N20       N21        N22        N23       N24       N25       N26
  P(B)       P(B)      P(B)       P(B)       P(B)      P(B)      P(B)      P(B)



--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu   Exit
 Save  Clrassign
Select: Block, ACAMI, Channel.
```

Displaying DS0 Channel Assignments

Use the Cross Connect Assignments screen to view which DS0 channels are currently assigned to the data port. Below each DS0 channel you will see either “Available” or “P”. DS0s with a “P” designation are assigned to the data port. DS0s marked “Available” are unused (unassigned).

Cross Connect Assignments may also be displayed by accessing the Cross Connect Status screen under the Status branch of the Main Menu.

Using the Block or ACAMI Assignment Method

By using the block or ACAMI (Alternate Channel Alternate Mark Inversion) assignment method, you can assign a data port to a block of contiguous DS0 channels on the network interface.

The block assignment method allows a block of contiguous channels to be assigned by specifying the number of DS0’s to allocate and an initial DS0 channel (the first DS0 channel in a block of DS0 channels). The number of channels assigned is determined by the port rate. These channels are automatically assigned to the destination network interface when the initial DS0 channel is selected.

The ACAMI assignment method also allows a block of contiguous channels to be assigned. However, with ACAMI, the number of channels assigned is twice the number needed for the port rate. This is because with ACAMI, every alternate DS0 channel (starting with the *n*+1 DS0 channel), does not carry data from the port, but instead always transmits and receives all ones.

▶ Procedure

To assign data ports by the block or ACAMI method:

1. Access the Cross Connect Assignments screen by following this menu selection sequence:

   Main Menu → Configuration → Load Configuration From →
   Cross Connect

2. Use the **Assign By** field to specify the assignment method (Block or ACAMI).

3. After filling in the **DS0s to Allocate** field, specify a port assignment for the first DS0 channel in a block of contiguous, available DS0 channels.

4. Select Ctrl-a and then Save to save your changes.

Using the Individual Channel Assignment Method

This channel method allows you to select the individual DS0 channels to allocate to the data port. The data port rate is automatically determined based on the number of channels selected. The DS0s do not need to be contiguous.

▶ Procedure

To assign the data port by the individual channel method:

1. Access the Cross Connect Assignments screen by following this menu selection sequence:

   Main Menu → Configuration → Load Configuration From → Cross Connect

2. Use the **Assign By** field to specify the assignment method (Channel).
3. Specify the port assignments for the individual DS0 channels. The DS0 channels do not need to be contiguous.
4. The port rate increases as the port is assigned to each additional DS0 channel. For example, if two DS0 channels (at 64 kbps each) are assigned to the data port, a port rate of 128 kbps is required.
5. Select Ctrl-a and then Save to save your changes.

Clearing DS0 Channel Assignments

You can clear (deallocate) all the DS0 channels currently allocated to network interface.

▶ Procedure

To clear DS0 channel allocation:

1. Access the Cross Connect Assignments screen by following this menu selection sequence:

   Main Menu → Configuration → Load Configuration From → Cross Connect

2. Select Ctrl-a and then Clrassign.
3. Press Enter to clear the specified DS0 channels.

Security

4

Overview

The DSU/CSU provides several methods of security by limiting user access to the ATI through option settings. Refer to *ATI Access* on page 4-4.

- Enable the Login Required option to require a Login ID for the:
  - Terminal Port
  - Telnet Session
- Limit the access:
  - Port Access Level option of 1, 2, or 3 for the Terminal port
  - Session Access Level option of 1, 2, or 3 for the Telnet Session
- Disable the access:
  - Telnet Session option
  - Facility Data Link (FDL) option
  - Ethernet Port Use option

SNMP security is handled through Community Names with access levels and IP address validation. Refer to *Controlling SNMP Access* on page 4-6.

Creating a Login

Logins apply to Terminal port and Telnet access to the ATI. Six login ID/password combinations are available. Each Login ID and Password must be unique and include an access level.

For additional information regarding the ATI access using the Login Required option, refer to *ATI Access* on page 4-4.

▶ Procedure

To create a login record:

1. Follow this menu selection sequence:

   Main Menu → Control → Administer Logins

2. Press Ctrl-a to switch to the screen function key area below the dotted line.
3. Select New and press Enter.
4. Create the login by entering the following fields. Login IDs and passwords are case-sensitive.

On the Administer Logins screen, for the . . .	**Enter . . .**
Login ID	1 to 10 ASCII printable characters
Password	1 to 10 ASCII printable characters
Access Level	Level 1, Level 2, or Level 3

NOTE:

Assign at least one Level 1 Access Level. Full access is necessary to make configuration option changes and administer logins.

5. Press Ctrl-a to switch to the screen function key area below the dotted line. Select Save and press Enter.
6. When Save is complete, Command Complete appears at the bottom of the screen. Select:

   — New to add another login record

   — MainMenu to go to the Main Menu

   — Exit to end the ATI session

Deleting a Login

▶ Procedure

To delete a login record:

1. Follow this menu selection sequence:

   Main Menu → Control → Administer Logins

2. Press Ctrl-a to switch to the screen function key area below the dotted line.
3. Select PgUp or PgDn and press Return to page through login pages/records until you find the one to be deleted.
4. Once the correct record is displayed, select Delete and press Enter.
5. To complete the delete action, select Save and press Enter.

   When the deletion is complete, Command Complete appears at the bottom of the screen. The number of login pages/records reflects one less record, and the record following the deleted record appears.

Resetting the DSU/CSU's COM Port or Factory Defaults

Misconfiguring the access unit could render the user interface inaccessible, leaving it in a state where a session cannot be started via the COM port or a Telnet session. If this occurs, access unit connectivity can be restored via a directly connected terminal.

Two methods can be used to restore access to the user interface:

- **Reset COM Port** – Allows you to reset the configuration options related to COM port usage. This also causes a device reset, where the access unit performs a Device Self-Test. No security-related configuration options are changed.
- **Reload Factory Defaults** – Allows you to reload the Default Factory Configuration, resetting all of the configuration and control settings which causes the current configuration to be destroyed and a device reset. This method is also useful when the user's password(s) have been forgotten.

▶ Procedure

To reset COM port settings:

1. At the async terminal that is directly connected to the access unit, configure the terminal to operate at 9.6 kbps, using character length of 8 bits, with one stop-bit, and no parity.
2. Reset the access unit, then immediately and repeatedly press Enter at a rate of about 1 press per second until the System Paused screen appears.
3. Tab to the desired method, and enter yes (or y) for the selected prompt.

If entering yes to prompt . . .	Then . . .
Reset COM Port usage	■ Port Type is set to Terminal ■ Data Rate (kbps) is set to 9.6 ■ Character Length is set to 8 ■ Stop Bits is set to 1 ■ Parity is set to None ■ External Device Commands is set to Disable
Reload Factory Defaults	All factory-loaded configuration and control settings contained in the Default Factory Configuration configuration area are loaded.

If no (or n) is entered, or if no selection is made within 30 seconds, the access unit returns to the condition or operation it was in when the system reset was initiated, with the COM port rate returning to its configured rate.

The access unit resets itself, going through a Device Self-Test. Connectivity is restored and the Main Menu screen appears.

ATI Access

Access to the ATI is available through either the Terminal port or a Telnet session.

Access to the ATI through the Terminal port can be limited. Refer to Table A-6, Terminal Port Options, to:

- Enable Login Required.
- Assign a Port Access Level of 1, 2, or 3.

The ATI can be accessed remotely through a Telnet Session via either the Ethernet port or the FDL. The DSU/CSU provides several methods for limiting access to the ATI through a Telnet session.

- Refer to Table A-7, Telnet Session Options, to:
  - Enable Login Required.
  - Assign a Telnet Session Access Level of 1, 2, or 3.
  - Disable Telnet access completely.
- To prevent the 10BaseT port and FDL from supporting a Telnet session:
  - Set the Ethernet Port Use option to Disable. Refer to Table A-5, Ethernet Port Options.
  - Disable the FDL. Refer to Table A-2, Network Interface Options.

NOTE:

Preventing access to the ATI by setting the FDL or Ethernet Port Use options to Disable also inhibits SNMP management over those interfaces.

Effective Access Level

The ATI effective access level (Table 4-1) is the more restrictive of:

- Port/Session access level, or
- The Access level associated with the Login ID.

For example, if a login ID is created with an Access Level 1 and the Terminal Port is set for a Port Access Level of 2, the effective access level to the ATI is 2.

Table 4-1. Effective Access Levels

ATI Access to Menu Functions	Effective Access Level 1	Effective Access Level 2	Effective Access Level 3
Status	Full Access	Full Access	Read-Only
Test	Full Access	Full Access	No Access
Configuration	Full Access	Read-Only	Read-Only
Control	Full Access	No Access	No Access

When user access to the ATI is attempted through the Terminal port or a Telnet session, the ATI response is based on the Login Required option and the availability of the ATI. Table 4-2 describes how the system responds to various ATI access conditions.

Table 4-2. ATI Access Conditions (1 of 2)

If access to the ATI is through the . . .	Then . . .	What to do now?
Terminal port with Security disabled with the Login Required option set to Disable (See Table A-6)	The Main Menu screen appears.	Select a menu option to begin your session.
Terminal port with Security enabled with the Login Required option set to Enable (See Table A-6)	You are prompted for a login ID and password.	If Invalid Password appears, re-enter the password. After three tries with an invalid password, contact the system administrator.
	The Main Menu screen appears if the login ID is not configured yet.	Select a menu option to begin your session.

Table 4-2. ATI Access Conditions (2 of 2)

If access to the ATI is through the . . .	Then . . .	What to do now?
Terminal port and the ATI is already in use with a Telnet session	**User Interface Already In Use** message appears with the active user's IP address and Login ID.	Try again later. When the ATI is available, the message **User Interface Idle** appears. Press Enter for the Main Menu.
Telnet session and the ATI is currently in use	**Connection Failed** message appears. The DSU/CSU allows only one ATI session.	Try again later.

Controlling SNMP Access

There are three methods for limiting SNMP access.

- Disable the SNMP management option.
- Assign SNMP community names and access levels. The DSU/CSU supports SNMP Version 1, which provides limited security through the use of community names.
- Limit SNMP access through validation of the IP address of each allowed SNMP manager.

Assigning SNMP Community Names and Access Levels

The DSU/CSU can be managed by an SNMP manager supporting the SNMP protocol. The community name must be supplied by an external SNMP manager accessing an object in the MIB.

To define SNMP community names, follow this menu selection sequence:

Main Menu → Configuration → (Load Configuration From) →
SNMP → General SNMP Management

Refer to Table A-8, General SNMP Management Options, to:

- Enable SNMP Management.
- Assign the SNMP community names of the SNMP Managers that are allowed to access the DSU/CSU's Management Information Base (MIB).
- Specify read or read-write access for each SNMP community name.

Limiting SNMP Access through the IP Addresses

The DSU/CSU provides an additional level of security through validation of the IP addresses.

The SNMP Management option must be enabled. To control SNMP access with IP addresses, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From →
SNMP→ SNMP NMS Security Options

Refer to Table A-9, SNMP NMS Security Options. The SNMP access can be limited by:

- Enabling NMS IP address validation to perform validation checks on the IP address of an SNMP management system attempting to access the DSU/CSU.
- Specifying read or read-write access for each NMS authorized to access the unit.

IP Addressing

5

IP Addressing

There are three IP addressing strategies to provide SNMP NMS connectivity.

- Local addressing only
- Extending subnet for FDL
- Unique subnet for the FDL

Review the following information before selecting an IP addressing scheme.

- Assign an IP address for the 10BaseT port and FDL management interfaces.
- Set the default gateway address. This is a default route for all destinations not on the LAN. The gateway should be a router on the LAN with routes to the rest of the network
- Each DSU/CSU routing table supports a maximum of 20 routes.
  - A subnet route is automatically added for the 10BaseT port
  - A Host route is automatically added for the FDL link using RIP
- Any legal host address is allowed for a given subnet.

IP Addressing Examples

Management of IP addressing is based on individual IP addresses assigned to each interface. The IP interfaces for the unit are:

- **Ethernet port** – See Table A-5, Ethernet Port Options.
- **FDL** – See Table A-2, Network Interface Options.

NOTE:

Do not assign IP addresses without the assistance of the network manager or individuals responsible for determining the IP addressing scheme for your organization.

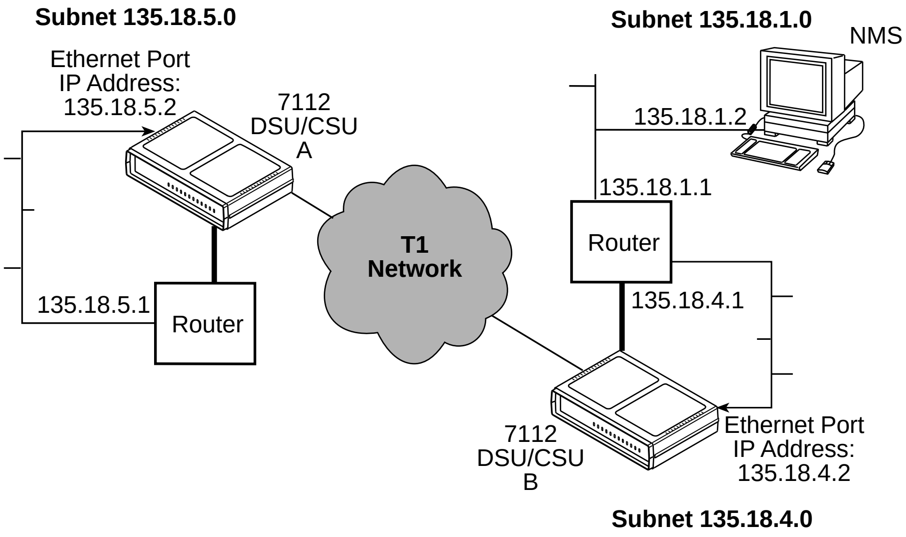
The following examples apply to IP (SNMP) management traffic only. The subnet mask shown for these examples is 255.255.255.000.

Local Addressing Only (No FDL)

In the following example, the DSU/CSUs do not use the FDL for management communications. This can be the result of using Fractional T1 service or Frame Relay Service. In this example both DSU/CSUs:

- Only receive management data through the 10BaseT port connection.
- Do not route the data between themselves. Routers route the management data for the connected DSU/CSUs using the user data path between the routers.

The following illustration shows each DSU/CSU with its own IP address on the LAN subnet.



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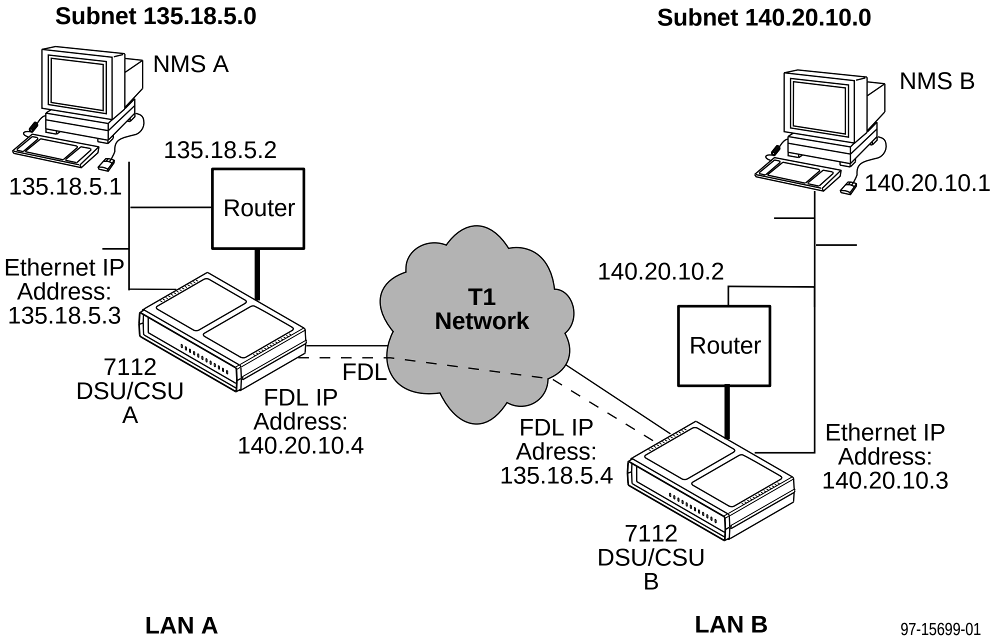
FDL Connection – Extending Subnet for FDL

In this example:

- DSU/CSU A is connected to the NMS on LAN A through the 10BaseT port.
- DSU/CSU A is connected to DSU/CSU B through the FDL.
- DSU/CSU B is addressed through the FDL as if it existed on LAN A.
- DSU/CSU A forwards all data to DSU/CSU B using Proxy ARP.
- A proprietary RIP is used to learn the IP addresses of the remote FDL interfaces. It can take up to 5 minutes for the RIP protocol to exchange addresses once the FDL is active.



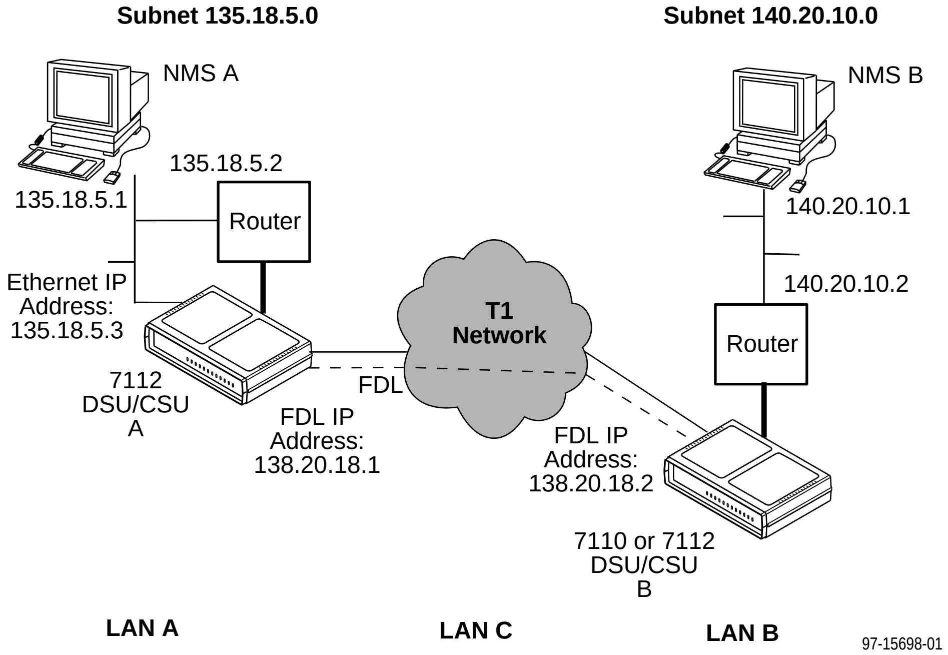
FDL Connection – Unique FDL Subnet

In this example:

- DSU/CSU A is connected to the NMS on LAN A through the 10BaseT port.
- DSU/CSU A is connected to DSU/CSU B through the FDL.
- DSU/CSU A and DSU/CSU B create their own unique Subnet (LAN C).

NOTE:

Interconnected DSU/CSUs automatically pass routing information between each other using a proprietary protocol. However, a static route to subnet 138.20.18.2 must be set in the routing table of the NMS Host or Router.



Assigning IP Addresses and Subnet Masks

After selecting an IP scheme, assign an address to the DSU/CSUs.

If using the . . .	**Then assign the . . .**
10BaseT port as a management interface	10BaseT port IP address and subnet mask. Refer to Table A-5, Ethernet Port Options.
FDL	IP address and subnet mask. Refer to Table A-2, Network Interface Options.

The DSU/CSU can validate the IP address of an NMS that attempts to access it. Refer to Table A-9, SNMP NMS Security Options.

Monitoring the DSU/CSU

6

What to Monitor

This chapter presents information on how to access and monitor DSU/CSU status and performance statistics on the T1 network. You can monitor DSU/CSU operations by monitoring:

- LEDs on the Status screen or the DSU/CSU's front panel
- System and Test Status screens
- Highest priority Health and Status message on the last line of all screens
- Cross Connect Status screen
- Network Interface Status screen
- Network Performance Statistics screen
- Network Management System via SNMP MIB objects
- SNMP traps and other information reported by your NMS via SNMP MIB objects

Table 6-1 shows the available indicators of alarm conditions on the network interface and the User Data port.

Table 6-1. Alarm Indicator Locations

Alarm Condition	Status Screen	Network LED
Loss of Signal (LOS)	Y	SIG
Out of Frame (OOF)	Y	OOF
Alarm Indication Signal (AIS)	Y	ALARM
Excessive Error Rate (EER)	Y	EER
Yellow	Y	ALARM

DSU/CSU LEDs

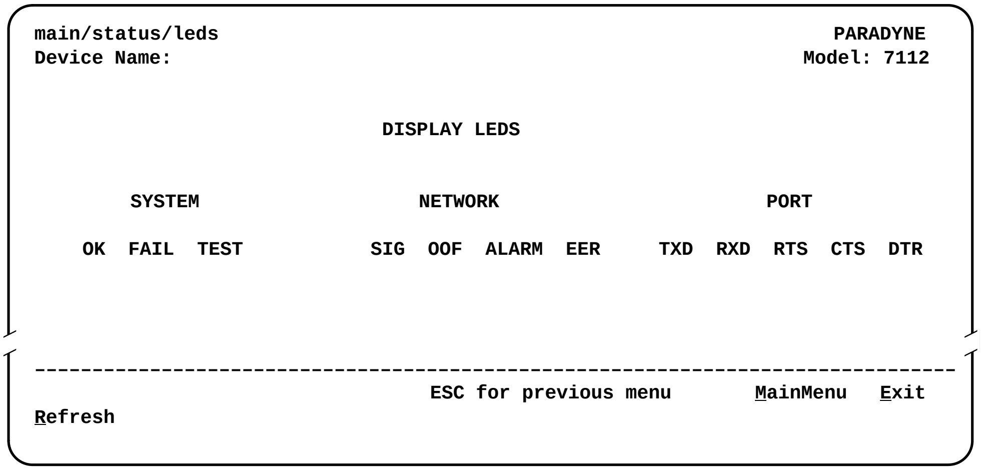
The DSU/CSU LEDs can be viewed on the Display LEDs Status screen. This ATI status screen is available locally and remotely.

The 12 LEDs are organized in three groups:

- **System** LEDs display the status of the unit.
- **Network** LEDs provide the status of the network interface.
- **Port** LEDs display the activity on the user data (DTE) port.

To view the LED status screen, follow this menu selection sequence:

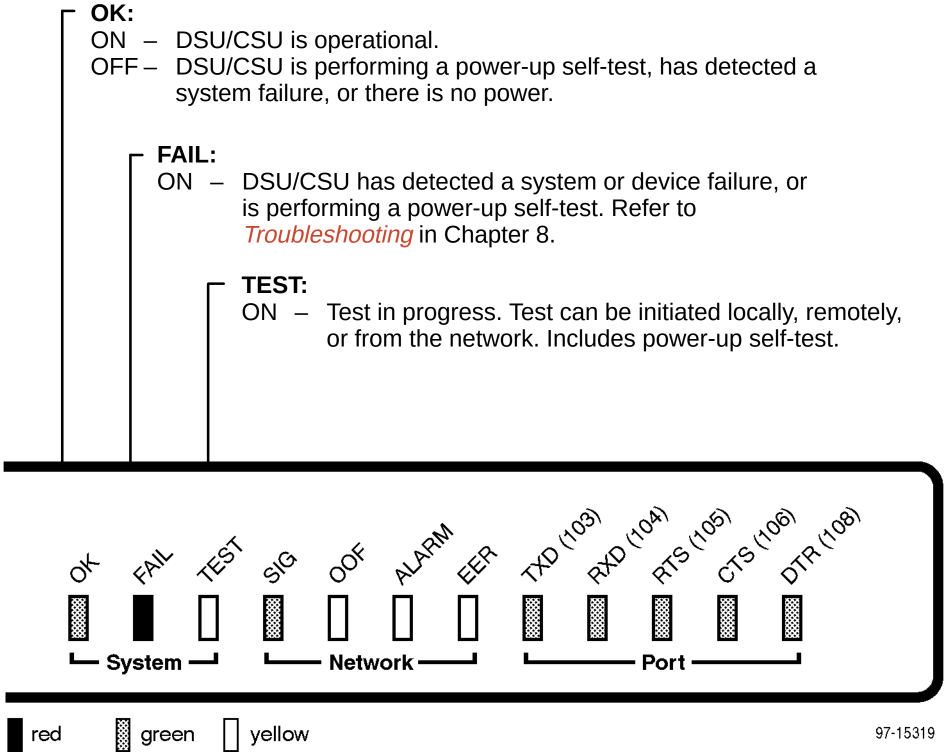
Main Menu → Status → Display LEDs



```
main/status/leds                                                   PARADYNE
Device Name:                                                    Model: 7112


                                DISPLAY LEDS


        SYSTEM                  NETWORK                   PORT

     OK   FAIL  TEST          SIG  OOF  ALARM  EER     TXD  RXD  RTS  CTS  DTR



--------------------------------------------------------------------------------
                                 ESC for previous menu      MainMenu   Exit
Refresh
```

When viewed via the ATI, the status display screen is updated approximately every 5 seconds. Use Refresh to obtain a current status of all LEDs.

System LEDs

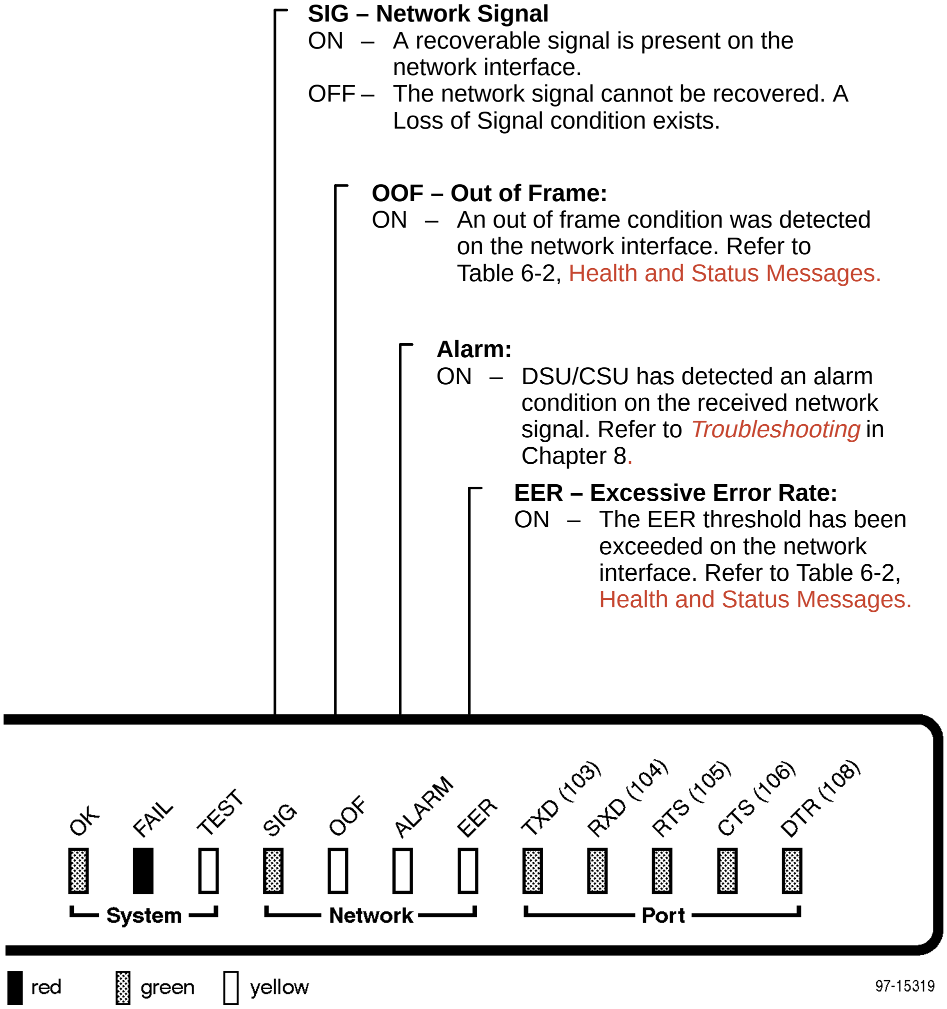


OK:
ON – DSU/CSU is operational.
OFF – DSU/CSU is performing a power-up self-test, has detected a system failure, or there is no power.

FAIL:
ON – DSU/CSU has detected a system or device failure, or is performing a power-up self-test. Refer to *Troubleshooting* in Chapter 8.

TEST:
ON – Test in progress. Test can be initiated locally, remotely, or from the network. Includes power-up self-test.

Network LEDs



SIG – Network Signal
ON – A recoverable signal is present on the network interface.
OFF – The network signal cannot be recovered. A Loss of Signal condition exists.

OOF – Out of Frame:
ON – An out of frame condition was detected on the network interface. Refer to Table 6-2, Health and Status Messages.

Alarm:
ON – DSU/CSU has detected an alarm condition on the received network signal. Refer to *Troubleshooting* in Chapter 8.

EER – Excessive Error Rate:
ON – The EER threshold has been exceeded on the network interface. Refer to Table 6-2, Health and Status Messages.

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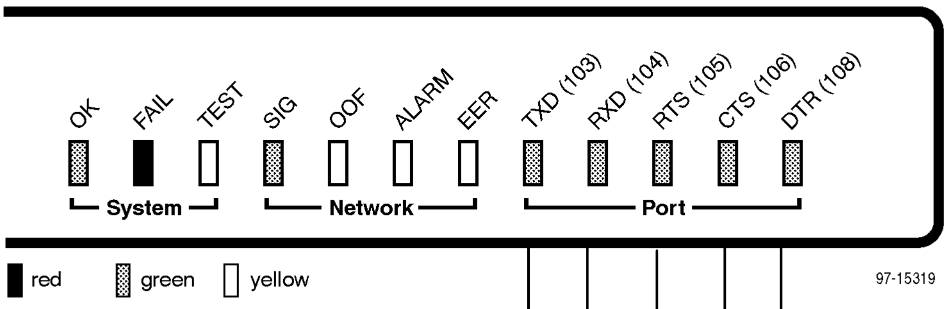
Port LEDs



TXD – Transmitted Data:
ON – Receiving a 0 from the DTE.
OFF – Receiving a 1 from the DTE.

RXD – Received Data:
ON – Sending a 0 to the DTE.
OFF – Sending a 1 to the DTE.

RTS – Request to Send:
ON – DTE is activating a control signal to indicate readiness to transmit data.

CTS – Clear to Send:
ON – DSU/CSU is activating a control signal to indicate to the DTE that it can start sending data.

DTR – Data Terminal Ready:
ON – DTE is activating a control signal to indicate readiness for operation.

Status Screen Commands

The status screens appear with the cursor in the function area below the dotted line. To update the information displayed, select Refresh and press Enter.

The System and Test Status screen provides a Clear command. Select Clear and press Enter to clear status messages for one-time events.

Statistics screens provide a ClrStats command. Select ClrStats and press Enter to clear all statistics and refresh the screen. ClrStats is not available for an Access level of 3.

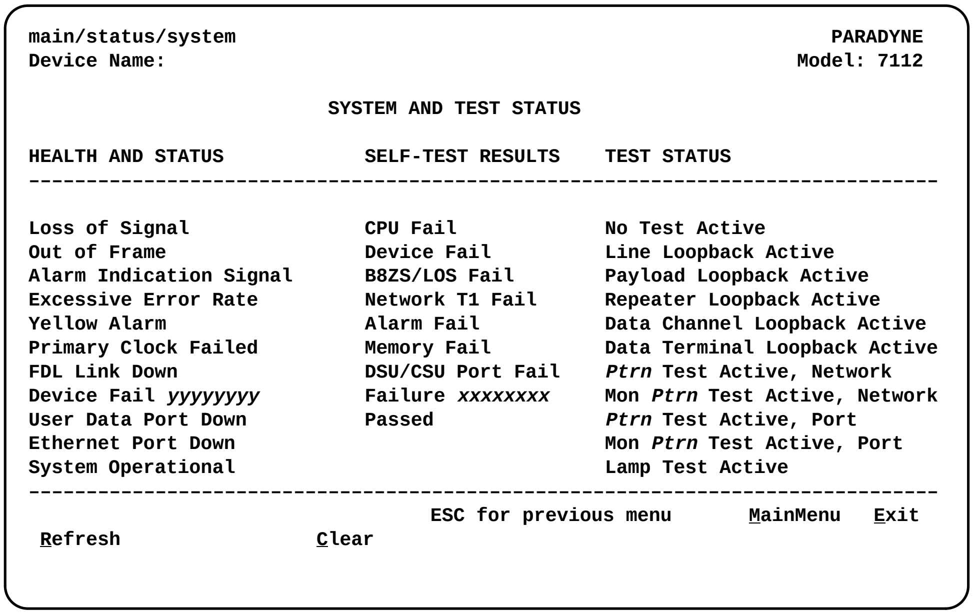
System and Test Status

To view System and Test Status information, follow this menu selection sequence:

Main Menu → Status → System and Test Status

The System and Test Status screen has three sections:

- **Health and Status** – Displays messages in priority order (highest to lowest). Refer to Table 6-2, Health and Status Messages.
- **Self-Test Results** – Results of the Diagnostic test run on the device itself. Refer to Table 6-3, Self-Test Results Messages.
- **Test Status** – Currently active tests. Refer to Table 6-4, Test Status Messages.



```
main/status/system                                                 PARADYNE
Device Name:                                                    Model: 7112

                           SYSTEM AND TEST STATUS

HEALTH AND STATUS            SELF-TEST RESULTS    TEST STATUS
-------------------------------------------------------------------------------

Loss of Signal               CPU Fail             No Test Active
Out of Frame                 Device Fail          Line Loopback Active
Alarm Indication Signal      B8ZS/LOS Fail        Payload Loopback Active
Excessive Error Rate         Network T1 Fail      Repeater Loopback Active
Yellow Alarm                 Alarm Fail           Data Channel Loopback Active
Primary Clock Failed         Memory Fail          Data Terminal Loopback Active
FDL Link Down                DSU/CSU Port Fail    Ptrn Test Active, Network
Device Fail yyyyyyyy         Failure xxxxxxxx     Mon Ptrn Test Active, Network
User Data Port Down          Passed               Ptrn Test Active, Port
Ethernet Port Down                                Mon Ptrn Test Active, Port
System Operational                                Lamp Test Active
-------------------------------------------------------------------------------
                                   ESC for previous menu      MainMenu   Exit
 Refresh                 Clear
```

Health and Status Messages

The following messages appear in the first column of the System and Test Status screen. The highest priority Health and Status message also appears on all ATI screens on the bottom right.

Table 6-2. Health and Status Messages (1 of 2)

Message	What Message Indicates	What To Do
Loss Of Signal	No signal is being received. Local DSU/CSU network problem. An LOS condition (175 consecutive zeros) has been detected on the network interface.	1. Verify that the network cable is securely attached at both ends. 2. Contact network provider.
Out of Frame	DSU/CSU is detecting an out of frame condition. This occurs when two out of four frame synchronization bits are in error.	1. Wait for the condition to clear. 2. Verify that the line framing format configuration option matches the setting of the network. 3. Contact network provider.
Alarm Indication Signal	An Alarm Indication Signal (unframed all ones signal) is being received from the network interface.	1. Check the status of the far-end device(s). 2. Contact network provider.
Excessive Error Rate	An Excessive Error Rate condition has been detected on the network interface. The condition is cleared when the error rate falls below the threshold value.	1. Contact network provider.
Yellow Alarm	A Yellow Alarm signal is being received from the network interface.	1. Check the status of the far-end device. 2. Contact network provider.
Primary Clock Failed	The primary clock has failed. Timing for the DSU/CSU is provided by the internal clock.	1. Check the clock source connector (DTE or Net). 2. If the primary clock was derived from the network, contact the network provider.
FDL Link Down	The FDL communication between the local and remote DSU/CSU is not working.	1. Verify that the remote unit has FDL enabled. 2. Contact network provider if problem persists.
Device Fail *yyyyyyyy*	An internal error has been detected by the operating software. *yyyyyyyy* indicates the 8-digit hexadecimal failure code.	1. Select the Clear function from the Status screen. 2. Provide the 8-digit failure code shown (*yyyyyyyy*) to your service representative.

Table 6-2. Health and Status Messages (2 of 2)

Message	What Message Indicates	What To Do
User Data Port Down	The DTE is not ready to transmit or receive data.	1. Check on the DTE status. Verify that the DTE is powered up and asserting DTR and RTS. 2. Disable send all 1's on data port not ready.
Ethernet Link Down	The DSU/CSU detects no electrical activity on the 10BaseT port.	1. Verify that the Ethernet cable is securely attached at both ends. 2. Contact your LAN support technician if problem persists.
System Operational	The unit is functioning properly and there are no status messages to display.	No action required.

Self-Test Results

The results of the last power-up or reset self-test appear in the middle column of the System and Test Status screen.

Table 6-3. Self-Test Results Messages

Message	What Message Indicates	What To Do
CPU Fail	The CPU failed internal testing.	1. Reset the unit and try again. 2. Select the Clear function on the Status screen. 3. Call your service representative for assistance.
Device Fail	One or more of the DSU/CSU's integrated circuit chips has failed device-level testing.	
B8ZS/LOS Fail	The DSU/CSU failed to transmit all ones or to detect a Loss of Signal.	
Network T1 Fail	The DSU/CSU failed to internally loop data on the network T1 circuit.	
Alarm Fail	The DSU/CSU failed to transmit AIS or to detect a Yellow alarm.	
Memory Fail	The DSU/CSU failed memory verification.	
DSU/CSU Port Fail	The Data Port failed self-test.	
Failure *xxxxxxxx*	An internal failure occurred. *(xxxxxxxx* represents an eight-digit hexadecimal failure code for use by service personnel.)	Record the failure code and contact your service representative.
Passed	No problems were found during power-up.	No action needed; no problems were found during power-up or reset.

Test Status Messages

The Test Status messages in the following table appear in the right column of the System and Test Status screen.

Table 6-4. Test Status Messages

Test Status Message	Meaning
No Test Active	No tests are currently running.
Line Loopback Active	The network Line Loopback test is active.
Payload Loopback Active	The network Payload Loopback test is active.
Repeater Loopback Active	The network Repeater Loopback test is active.
Data Channel Loopback Active	The Data Channel Loopback test is active for the data port.
Data Terminal Loopback Active	The Data Terminal Loopback test is active for the data port.
QRSS Test Active, Network	The QRSS test pattern is being sent over the network interface.
1-in-8 Test Active, Network	The 1-in-8 test pattern is being sent over the network interface.
Mon QRSS Test Active, Network	DSU/CSU is monitoring a QRSS test pattern over the network interface.
QRSS Test Active, Port	The QRSS test pattern is being sent on the port interface.
511 Test Active, Port	The 511 test pattern is being sent on the port interface.
Mon QRSS Test Active, Port	DSU/CSU is monitoring a QRSS test pattern on the port interface.
Mon 511 Test Active, Port	DSU/CSU is monitoring a 511 test pattern on the port interface.
Lamp Test Active	The Lamp Test is active, causing the LEDs on the front panel to light.

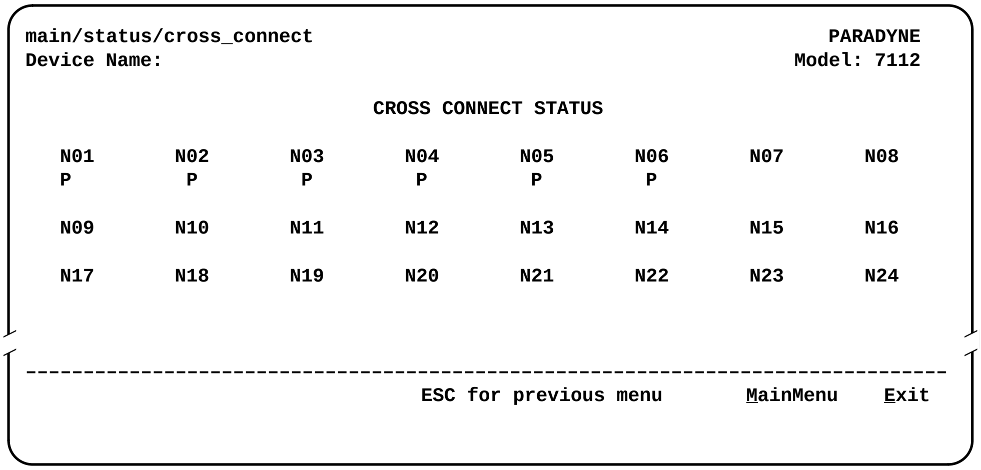
Cross Connect Status

Use the Cross Connect Status screen to display the network interface time slots assigned to the data port. These assignments are made using the Cross Connect configuration option.

Use the following menu sequence to display network channel information.

Main Menu → Status → Cross Connect Status

The Cross Connect Status screen displays 24 two-field entries in three rows. Together, each two-field entry defines the assignment for one network interface time slot. The top field represents the time slot of the network interface. The bottom field shows whether or not the time slot is assigned to the data port.



```
main/status/cross_connect                                         PARADYNE
Device Name:                                                   Model: 7112

                              CROSS CONNECT STATUS

   N01       N02       N03       N04       N05       N06       N07       N08
   P         P         P         P         P         P

   N09       N10       N11       N12       N13       N14       N15       N16

   N17       N18       N19       N20       N21       N22       N23       N24


--------------------------------------------------------------------------------
                                  ESC for previous menu       MainMenu    Exit
```

The following information is available for viewing.

The Network Time Slot Fields (top) . . .	**Indicate the . . .**
N01 to N24	Network Interface time slot (01 to 24).

The Cross Connect Status Field (bottom) . . .	**Indicates the time slot is . . .**
blank	Unassigned.
P	Assigned to the data port.

Network Performance Statistics

Network performance statistics allow you to monitor the current status of the network operations. Performance statistics can assist you in determining the duration of specific conditions and provide a historical context for problem detection and analysis.

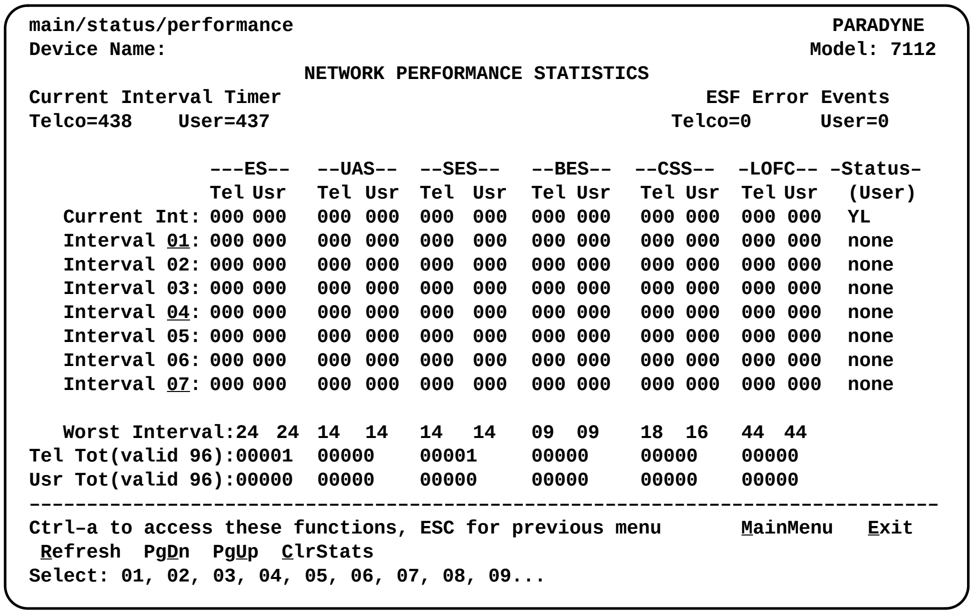
When the network interface is configured for ESF framing, network performance is continuously monitored and maintained in two sets of aggregate registers:

- Carrier Network Interface Registers (Telco)
- User Network Interface Registers (User)

These status registers collect performance data for the previous 24-hour period. Performance data is updated in 15-minute intervals. After 15 minutes, the current interval is rolled over into a set of accumulator registers that represent the previous 96 15-minute intervals for the register. An interval total of how many of the 96 registers contain valid data is also kept, as well as a 24-hour total for each accumulator register.

To view the Network Performance Statistics, follow this menu selection sequence:

Main Menu → Status → Network Performance Statistics



```
main/status/performance                                        PARADYNE
Device Name:                                                 Model: 7112
                        NETWORK PERFORMANCE STATISTICS
Current Interval Timer                                     ESF Error Events
Telco=438    User=437                                   Telco=0      User=0

               ---ES--   --UAS--  --SES--   --BES--  --CSS--  -LOFC-- -Status-
               Tel Usr   Tel Usr  Tel  Usr  Tel Usr   Tel Usr  Tel Usr  (User)
   Current Int: 000 000   000 000  000  000  000 000   000 000  000 000   YL
   Interval 01: 000 000   000 000  000  000  000 000   000 000  000 000   none
   Interval 02: 000 000   000 000  000  000  000 000   000 000  000 000   none
   Interval 03: 000 000   000 000  000  000  000 000   000 000  000 000   none
   Interval 04: 000 000   000 000  000  000  000 000   000 000  000 000   none
   Interval 05: 000 000   000 000  000  000  000 000   000 000  000 000   none
   Interval 06: 000 000   000 000  000  000  000 000   000 000  000 000   none
   Interval 07: 000 000   000 000  000  000  000 000   000 000  000 000   none

   Worst Interval:24  24  14  14   14   14   09  09    18  16   44  44
Tel Tot(valid 96):00001  00000    00001     00000     00000    00000
Usr Tot(valid 96):00000  00000    00000     00000     00000    00000
-------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu   Exit
 Refresh  PgDn  PgUp  ClrStats
Select: 01, 02, 03, 04, 05, 06, 07, 08, 09...
```

NOTE:

Network performance statistics are only available for those interfaces using ESF framing. Verify that the Line Framing Format field on the Network Interface screen is set to ESF.

You can reset the user performance registers via the **ClrStats** selection on the Performance Statistics screen.

> **NOTE:**
>
> **ClrStats** only resets the user events. Telco events are cleared during a power-on reset.

There are four sections to the Network Performance Statistics screen:

- Summary Information
- Interval Table
- Worst Interval
- 24-Hour Totals

Summary Information

Summary information provides the following information:

- **Current Interval Timer** – displays the number of seconds that have elapsed in the current 15-minute interval.
- **ESF Error Events** – displays the number of ESF frames with either a CRC error or an OOF event.

  The ESF Error Event statistic is *not* reset every 15 minutes. If the counter reaches 65,535, it remains at this value until reset.

  The Telco counter for ESF Error Events can only be cleared by a reset command from the network or a reset of the device itself.

  The User counter for ESF Error Events can only be reset by selecting the ClrStats option or by resetting the device.

Interval Table

Network performance statistics are kept for each 15-minute interval over the past 24-hour period. There are six types of statistics recorded:

- **Errored Seconds (ES)** – The number of errored seconds for the current interval. An errored second is any second with one or more ESF error events. The maximum is 900 seconds.
- **Unavailable Seconds (UAS)** – The number of unavailable seconds for the current interval. An unavailable second is any one second interval when service is unavailable. (Detection occurs with 10 consecutive unavailable seconds.) The maximum is 900 seconds.
- **Severely Errored Seconds (SES)** – The number of severely errored seconds for the current interval. A severely errored second is any second with 320 or more CRC errors, or any second with one or more OOF events. The maximum is 900 seconds.

- **Bursty Errored Seconds (BES)** –The number of bursty errored seconds for the current interval. A bursty errored second is any second with more than one, but less than 320, CRC errors. The maximum is 900 seconds.
- **Controlled Slip Seconds (CSS**) – The number of controlled slip seconds for the current interval.
- **Loss of Frame Count (LOFC)** – The loss of frame count for the current interval. This is a count of the number of times that an LOF is declared. The maximum count is 255.

A Telco set and a user set are kept for each of the above statistics. The user set is a copy of the Telco set, but the user set can be cleared.

In addition to the statistics kept for the network interface, the system maintains a Status register for each interval (far-right column). The Status register shows whether or not the following events have occurred at least once within the 15-minute interval:

- Y – Yellow Alarm
- L – Loss of Signal
- E – Excessive Error Rate
- F – Frame Synchronization Bit Error
- V – Line Code Violation
- none

Every 15 minutes, the current interval's data is rolled over into a set of accumulator registers that represent the previous 96 15-minute intervals for the register. All counts show the number of occurrences since the last reset of the counters.

When you enter the Network Performance Statistics screen, the current interval and seven most recent intervals are displayed. To display other intervals:

- Use the PgUp and PgDn selections. Intervals display as a series of 7 consecutive periods (recent to old).
- Tab to one of the rows in the interval table that has an underlined interval number (intervals 1, 4, and 7 when first displayed). Type the number of the interval you want to display at any of these three underlined locations. Intervals are numbered from 1 (most recent) to 96 (oldest). For example:
  - — Enter 10 on the top line to display intervals 10 through 17.
  - — Enter 10 on the middle line to display intervals 7 through 13.
  - — Enter 10 on the bottom line to display intervals 4 through 10.

Worst Interval

To assist you in selecting trouble spots, a Worst Interval is also displayed. The Worst Interval is the 15-minute period that contains the largest number of seconds for either ES, UAS, SES, BES, or CSS, or the greatest Loss of Frame Count (LOFC). If more than one interval contains the same worst value, then the oldest interval is displayed.

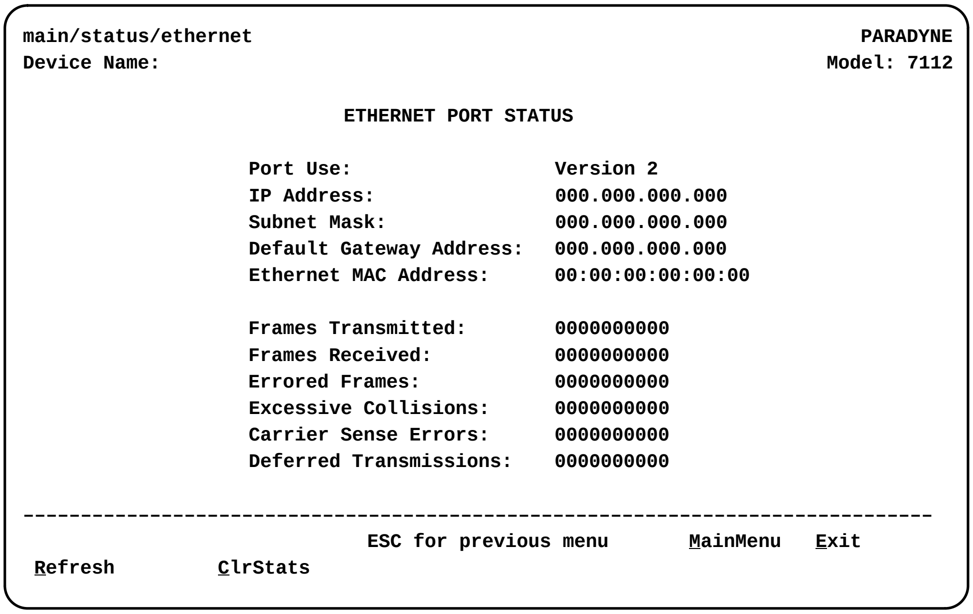
24-Hour Totals

The last two lines on the screen (above the dotted line) display the totals for each statistic over the last 24 hours, along with the number of valid intervals included in the total (up to 96).

Ethernet Port Status

To view the Ethernet (10BaseT) Port Status, follow this menu selection sequence:

Main Menu → Status → Ethernet Port Status



```
main/status/ethernet                                                PARADYNE
Device Name:                                                     Model: 7112

                            ETHERNET PORT STATUS

                   Port Use:                 Version 2
                   IP Address:               000.000.000.000
                   Subnet Mask:              000.000.000.000
                   Default Gateway Address:  000.000.000.000
                   Ethernet MAC Address:     00:00:00:00:00:00

                   Frames Transmitted:       0000000000
                   Frames Received:          0000000000
                   Errored Frames:           0000000000
                   Excessive Collisions:     0000000000
                   Carrier Sense Errors:     0000000000
                   Deferred Transmissions:   0000000000

-------------------------------------------------------------------------------
                              ESC for previous menu       MainMenu   Exit
 Refresh         ClrStats
```

Table 6-5 describes the fields on the Ethernet Port Status screen.

Table 6-5. Ethernet Port Status Screen Contents (1 of 2)

Label	What the Field Indicates
Port Use	The port is enabled if 802.3 or Version 2 is displayed. The port is disabled if Disable is displayed.
IP Address	The IP address of the port.
Subnet Mask	The subnet mask to be used with the IP address.
Default Gateway Address	The gateway to be used for packets that do not have a route.
Ethernet MAC Address	The physical address of the port.
Frames Transmitted	The number of frames transmitted.
Frames Received	The number of frames received.

Table 6-5. Ethernet Port Status Screen Contents (2 of 2)

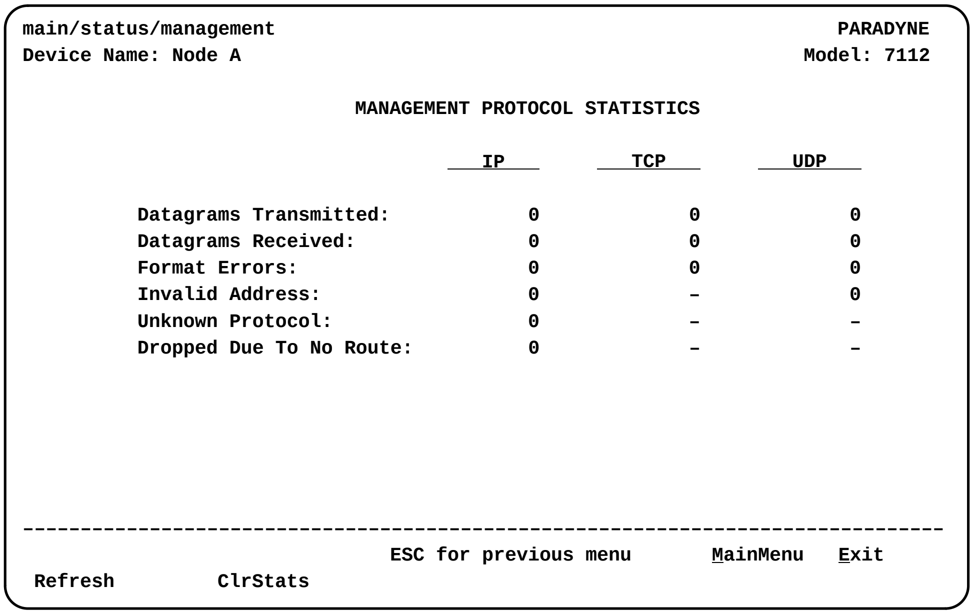
Label	What the Field Indicates
Errored Frames	The number of frames in error. This is the sum of frames with alignment errors, FCS (Frame Check Sequence) errors, and framing errors.
Excessive Collisions	The number of frames for which transmission failed due to excessive collisions.
Carrier Sense Errors	The number of times the carrier sense condition was lost or never asserted.
Deferred Transmissions	The number of frames for which the first transmission attempt is delayed because the medium is busy.

All counts show the number of occurrences since the last reset of the counters.

Management Protocol Statistics

To view the Management Protocol Statistics, follow this menu selection sequence:

Main Menu → Status → Management Protocol Statistics



```
main/status/management                                                PARADYNE
Device Name: Node A                                                Model: 7112

                            MANAGEMENT PROTOCOL STATISTICS

                                        IP           TCP           UDP

          Datagrams Transmitted:         0             0             0
          Datagrams Received:            0             0             0
          Format Errors:                 0             0             0
          Invalid Address:               0             –             0
          Unknown Protocol:              0             –             –
          Dropped Due To No Route:       0             –             –








--------------------------------------------------------------------------------
                               ESC for previous menu       MainMenu   Exit
 Refresh         ClrStats
```

Table 6-6 describes the fields on the Management Protocol Statistics screen.

Table 6-6. Management Protocol Statistics Screen Contents

Label	What the Field Indicates
Datagrams Transmitted	The number of datagrams successfully transmitted at each protocol layer.
Datagrams Received	The number of datagrams successfully received at each protocol layer.
Format Errors	The number of protocol packets that contained errors.
Invalid Address	The number of protocol packets that contained invalid addresses.
Unknown Protocol	The number of datagrams that were lost due to unknown protocols.
Dropped Due To No Route	The number of datagrams that were lost due to no route.

All counts show the number of occurrences since the last reset of the counters.

Testing

7

Detecting Problems

The DSU/CSU can detect and report problem conditions and perform diagnostic tests. The DSU offers a number of indicators to alert you to possible problems:

- LEDs – Refer to *DSU/CSU LEDs* in Chapter 6, *Monitoring the DSU/CSU*.
- SNMP Traps – For information on traps, refer to *Configuring SNMP Traps* in Chapter 8, *Messages and Troubleshooting*.
- Health and status messages and network performance statistics. Refer to Chapter 6, *Monitoring the DSU/CSU*.
- Alarm Condition Indications.

The following table shows the available indicators of alarm conditions on the network interface and the User Data port.

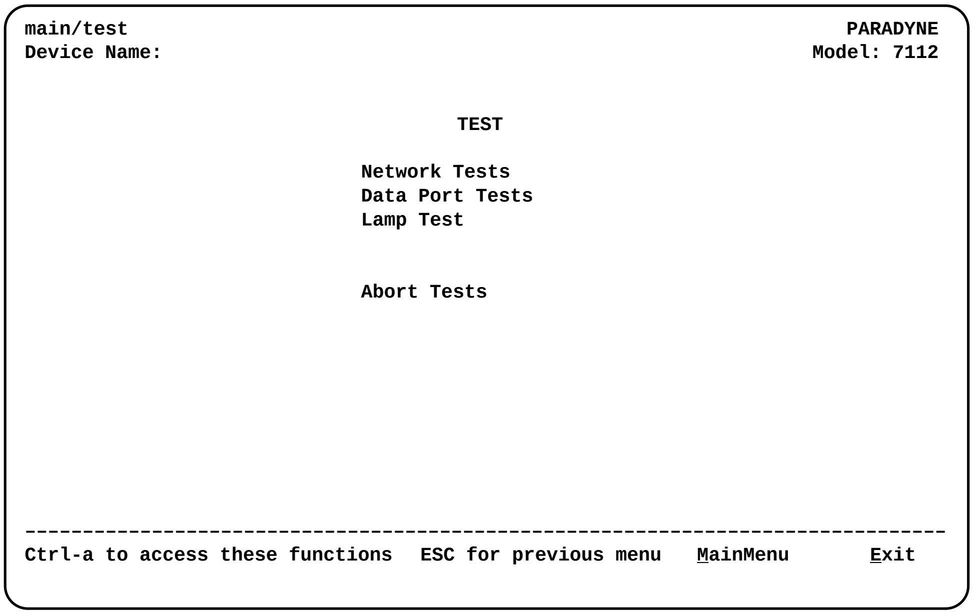
Alarm Condition	SNMP Trap	ATI Status Screen	Specific LED
Loss of Signal (LOS)	Y[1]	Y	Y
Out of Frame (OOF)	Y[1]	Y	Y
Alarm Indication Signal (AIS)	Y[1]	Y	N
Excessive Error Rate (EER)	Y[1]	Y	N
Yellow	Y[1]	Y	Y
FDL Link Down	Y[1]	Y	N
User Data Port Down	Y[1]	Y	Y
[1] Link Up/Link Down Trap			

Accessing the Test Menu

From the Test menu, you can run network tests, data port tests, and a lamp test for the front panel LEDs.

The Test menu is limited to users with an access level of 1 or 2 (Refer to Chapter 4, *Security*). To access the Test menu, follow this menu selection sequence:

Main Menu → Test

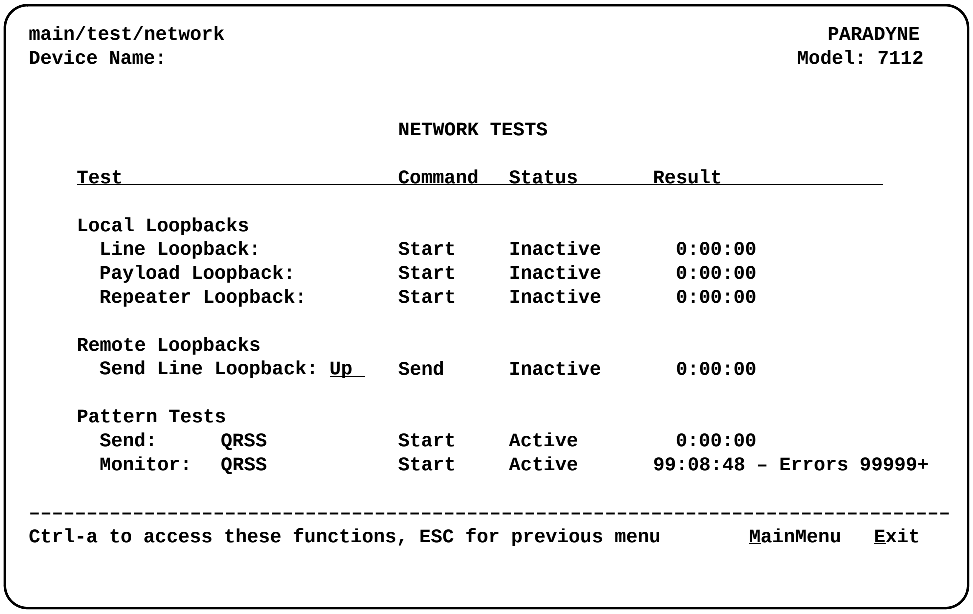


```
main/test                                                           PARADYNE
Device Name:                                                     Model: 7112


                                       TEST

                             Network Tests
                             Data Port Tests
                             Lamp Test


                             Abort Tests









--------------------------------------------------------------------------------
Ctrl-a to access these functions   ESC for previous menu   MainMenu      Exit
```

Running Network Tests

Network tests require the participation of your network service provider. To access the Network Tests screen, follow this menu selection sequence:

Main Menu → Test → Network Tests



```
main/test/network                                                    PARADYNE
Device Name:                                                       Model: 7112


                                NETWORK TESTS

    Test                        Command   Status      Result

    Local Loopbacks
      Line Loopback:            Start     Inactive      0:00:00
      Payload Loopback:         Start     Inactive      0:00:00
      Repeater Loopback:        Start     Inactive      0:00:00

    Remote Loopbacks
      Send Line Loopback: Up    Send      Inactive      0:00:00

    Pattern Tests
      Send:      QRSS           Start     Active        0:00:00
      Monitor:   QRSS           Start     Active      99:08:48 – Errors 99999+

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu        MainMenu   Exit
```

Use the Command column to start or stop a test by pressing Enter. The Result column displays the test duration since the last device reset. When the Monitor QRSS test is active, ResetMon is available to reset the error counter to zero.

Selecting the Stop command on the Network Test screen or Abort Tests from the Test menu will not disrupt a network-initiated loopback.

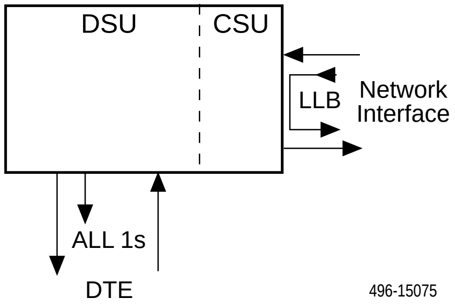
Line Loopback

Line Loopback (LLB) loops the received signal on the network interface back to the network without change.

▶ Procedure

To run a Line loopback:

1. Position the cursor at the Start command next to Line Loopback on the Network Tests screen and press Enter.
2. The Start command is changed to Stop. If you want to manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.



Line Loopback cannot be started when any of the following tests are already active:

- Payload Loopback
- Data Channel Loopback
- Send Pattern test on the network interface.

Payload Loopback

Payload Loopback (PLB) loops the received signal on the network interface back to the network. Framing CRCs and BPVs are corrected.

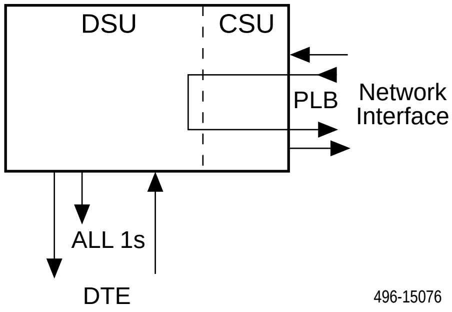
▶ Procedure

To run a Payload loopback:

1. Position the cursor on the Start command next to Payload Loopback on the Network Tests screen and press Enter.

   The Start command is changed to Stop.

2. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.



Payload Loopback cannot be started when any other loopback or Send Pattern test is already active on the network interface.

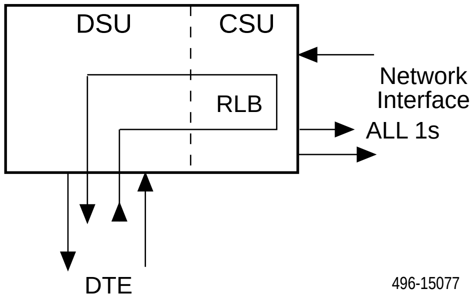
Repeater Loopback

Repeater Loopback (RLB) loops the signal being sent from the data port back to the data port. Framing CRCs and BPVs are corrected.

▶ Procedure

To run a Repeater loopback:

1. Position the cursor at the Start command next to Repeater Loopback on the Network Tests screen and press Enter.
2. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.



Repeater Loopback cannot be started when any of the following tests are already active:

- Data Terminal Loopback
- Data Channel Loopback
- Payload Loopback.

Remote Send Line Loopback

Remote Send Line Loopback sends the line loopback up or down code on the network interface for 10 seconds.

▶ Procedure

To run a Send Remote Line loopback:

1. Position the cursor at the Up or Down selection next to Send Line Loopback on the Network Tests screen.
2. Press the space bar to select either Up or Down.
3. Position the cursor at the Send command next to Up or Down selection and press Enter.

   The Send command is changed to Sending. The loopback will stop automatically after 10 seconds. You cannot stop the Remote Send Line Loopback test manually.

Remote Send Line Loopback cannot be started when any other loopback or a Send Pattern test is already active on the network interface.

Test Patterns for the Network

The Send test sends a QRSS or 1-in-8 test pattern over the network interface. The Monitor test monitors the QRSS test pattern over the network interface.

▶ Procedure

To run a Send pattern test:

1. Position the cursor at the QRSS or 1-in-8 selection next to Send on the Network Tests screen.
2. Press the space bar to select the desired test pattern (QRSS or 1-in-8).
3. Position the cursor at the Start command next to the selected pattern and press Enter.

   The Start command is changed to Stop.
4. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

▶ Procedure

To run a Monitor QRSS test:

1. Position the cursor at the Start command next to Monitor QRSS on the Network Tests screen.
2. If desired, use Ctrl-a to switch to the screen function key area and use the virtual function key r or R (ResetMon) to clear the error counter to zero. Press Ctrl-a to return the cursor to the Start command and press Enter.

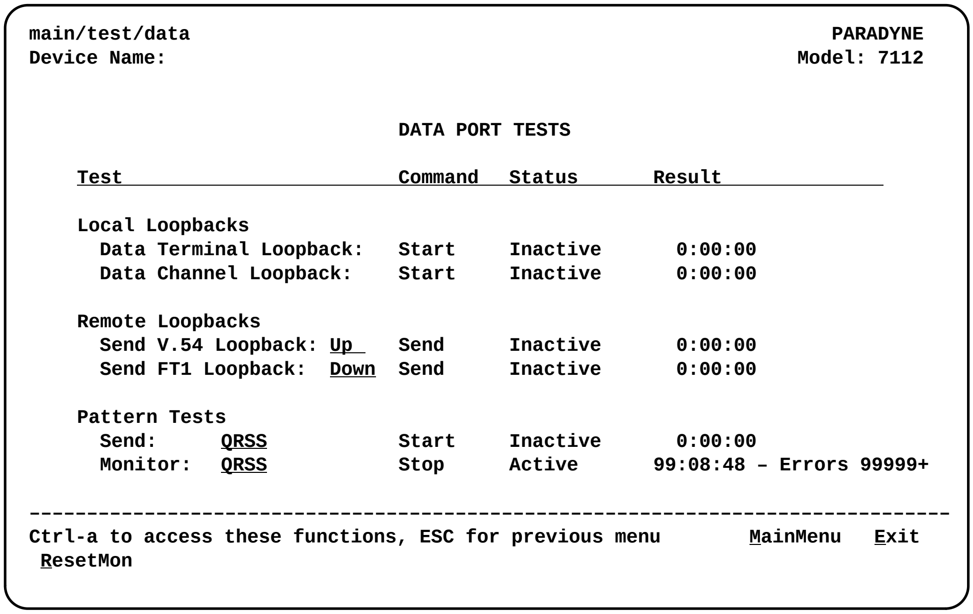
   The Start command is changed to Stop.
3. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.

The Send and Monitor Pattern tests cannot be started when any loopback is already active on the network interface.

Running Data Port Tests

To access the Data Port Tests screen, follow this menu selection sequence:

Main Menu → Test → Data Port Tests



```
main/test/data                                                           PARADYNE
Device Name:                                                          Model: 7112


                                DATA PORT TESTS

    Test                        Command   Status       Result

    Local Loopbacks
      Data Terminal Loopback:   Start     Inactive       0:00:00
      Data Channel Loopback:    Start     Inactive       0:00:00

    Remote Loopbacks
      Send V.54 Loopback: Up    Send      Inactive       0:00:00
      Send FT1 Loopback:  Down  Send      Inactive       0:00:00

    Pattern Tests
      Send:     QRSS            Start     Inactive       0:00:00
      Monitor:  QRSS            Stop      Active       99:08:48 – Errors 99999+

--------------------------------------------------------------------------------
Ctrl-a to access these functions, ESC for previous menu       MainMenu   Exit
 ResetMon
```

Data Terminal Loopback

Data Terminal Loopback (DTLB) loops the user data back to the DTE. This loopback is located as closely as possible to the User Data Port (DTE) interface.

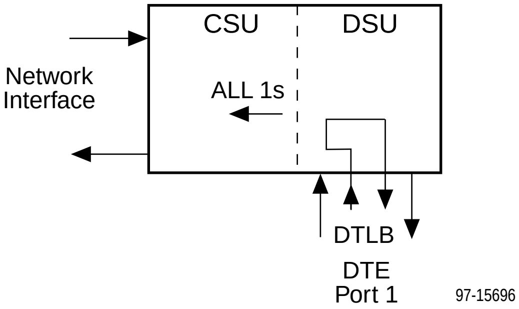
▶ Procedure

To run a data terminal loopback:

1. Position the cursor at the Start command next to Data Terminal Loopback on the Data Port Tests screen and press Enter.

   The Start command is changed to Stop.

2. To manually stop the test, verify that the cursor is positioned at the Stop command and press Enter.



Data Terminal Loopback cannot be started when any other loopback is already active on the data port.

Data Channel Loopback

Data Channel Loopback (DCLB) loops the data from all network DS0 channels assigned to the port back to the network. This loopback is located as closely as possible to the User Data Port (DTE) interface.

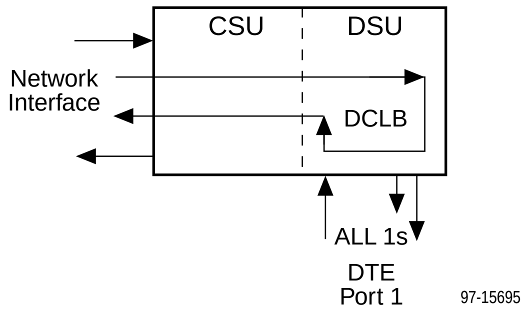
▶ Procedure

To run a data channel loopback:

1. Position the cursor at the Start command next to Data Channel Loopback on the Sync Data Port Tests screen and press Enter.

   The Start command is changed to Stop.

2. If you want to manually stop the test, verify that the cursor is positioned at the Stop command and press enter.



Data Channel Loopback cannot be started when any of the following tests are active:

- Line, Payload, or Repeater Loopback on the network interface
- DTE Payload loopback on the data port.

Send V.54 Up/Down Sequences

The local DSU/CSU can send an ITU-T V.54 Up or Down sequence to request the start or stop of a Data Channel Loopback on a remote DSU/CSU.

The DSU/CSU can send:

- In-band V.54 Up (activation) code to request the start of a Data Channel Loopback (V.54 Loop 2) at the remote DSU/CSU.
- In-band V.54 Down (deactivation) code to request termination of a Remote Data Channel Loopback (V.54 Loop 2) at the remote DSU/CSU.

▶ Procedure

To send an V.54 Up or Down sequence to a remote unit:

1. Position the cursor at the Up or Down selection next to Send V.54 Loopback on the Data Port Tests screen.
2. Press the space bar to select the desired code (Up or Down).
3. Position the cursor at the Start command next to Send V.54 Loopback on the Sync Data Port Tests screen.
4. Press Enter.

   The Start command is changed to Sending. The Up or Down sequence transmission stops automatically after 10 seconds. You cannot stop the sequence manually.

The Send V.54 Up/Down test cannot be started when any loopback or Send Pattern test is active on the network interface.

Send FT1 Up/Down Sequences

The local DSU/CSU can send an ANSI T1.403 (Annex B) Up or Down sequence to request the start or stop of a Data Channel Loopback on a remote DSU/CSU.

The DSU/CSU can send:

- In-band ANSI T1.403 (Annex B) Up (activation) code to request the start of a Data Channel Loopback at the remote DSU/CSU.
- In-band ANSI T1.403 (Annex B) Down (deactivation) code to request termination of a Remote Data Channel Loopback at the remote DSU/CSU.

▶ Procedure

To send an FT1 Up or Down sequence to a remote unit:

1. Position the cursor at the Up or Down selection next to Send FT1 Loopback on the Data Port Tests screen.
2. Press the space bar to select the desired code (Up or Down).
3. Position the cursor at the Start command next to Send FT1 Loopback on the Data Port Tests screen.
4. Press Enter.

   The Start command is changed to Sending. The Up or Down sequence transmission stops automatically after 10 seconds. You cannot stop the sequence manually.

The Send FT1 Up/Down test cannot be started when any loopback or Send Pattern test is active on the network interface.

Test Patterns for the DTE

This test sends a QRSS or 511 test pattern, or monitors a QRSS or 511 test pattern over the User Data Port interface.

▶ Procedure

To run a Send Pattern test:

1. Position the cursor at the QRSS or 511 pattern selection next to Start QRSS on the Data Port Tests screen.
2. Press the space bar to select the desired test pattern (QRSS or 511).
3. Position the cursor at the Start command next to the desired Send pattern.
4. Press Enter.

   The Start command is changed to Stop. If you want to manually stop the test, verify that the cursor is positioned at the Stop command.

▶ **Procedure**

To run a Monitor Pattern test:

1. Position the cursor at the Start command next to Monitor QRSS on the Data Port Tests screen.
2. Press Enter.

   The Start command is changed to Stop. If you want to manually stop the test, verify that the cursor is positioned at the Stop command.

The Send and Monitor Pattern tests cannot be started when any loopback is already active on the data port.

Lamp Test

The Lamp test determines whether all LEDs are lighting properly.

During the Lamp test, all LEDs blink simultaneously every second. When you stop the Lamp test, the LEDs are restored to their normal condition.

Ending an Active Test

A test initiated by the user can be ended by the user.

- A Test Timeout option is available to automatically terminate a user-initiated Loopback or Pattern test (as opposed to manually terminating a test) after it has been running a specified period of time. Refer to Table A-1, System Options.

  Test Timeout does not pertain to tests commanded by the:

  — Network, such as the network-initiated Line and Payload Loopbacks.

  — DTE, such as the DTE-initiated Data Channel Loopback.

- On each test screen is a command column. Pressing Enter when the cursor is on the Stop command stops the test.
- Use the Abort Tests selection from the Test menu to stop all tests running on all interfaces, with the exception of network or DTE-initiated loopbacks. Command Complete appears when all tests on all interfaces have been terminated.

Test status messages appear in the right-most column of the System and Test Status screen. See Table 6-4, Test Status Messages, in Chapter 6.

Messages and Troubleshooting

8

Overview

There are many messages available to assess the status of the device and contribute to problem resolutions. Refer to the following sections:

- *SNMP Traps*
  - *Configuring SNMP Traps*
- *Device Messages*
- *Troubleshooting*

SNMP Traps

SNMP traps are unsolicited messages sent out from the DSU/CSU automatically when the DSU/CSU detects conditions set by the user.

Configuring SNMP Traps

An SNMP trap can be automatically sent out through the FDL or the Ethernet port to the SNMP manager when the DSU/CSU detects conditions set by the user. These traps enable the SNMP manager to gauge the state of the device. Refer to Appendix D, *Standards Compliance for SNMP Traps,* for details of SNMP traps supported by the DSU/CSU.

To configure the DSU/CSU for SNMP traps, use the SNMP Traps Options screen to:

- Enable SNMP traps.
- Set the number of SNMP managers that receive SNMP traps from the DSU/CSU.
- Enter an IP address and network destination for each SNMP manager specified.
- Select the type of SNMP traps to be sent from the DSU/CSU.

To configure SNMP Traps, follow this menu selection sequence:

> *Main Menu → Configuration → Load Configuration From → SNMP → SNMP Traps*

Refer to Table A-10, SNMP Traps Options.

Device Messages

The Device Messages in Table 8-1, listed in alphabetical order, may appear in the messages area at the bottom of the ATI screens.

Table 8-1. Device Messages (1 of 2)

Device Message	What Message Indicates	What To Do
Cannot Save – no Login IDs with Access Level 1	All of the login IDs being saved have an access level below Level 1.	Change the access level of at least one Login ID to Level 1 so that configuration changes can be made. (Levels 2 and 3 cannot make configuration changes.) Save the Login IDs.
Command Complete	Action requested has successfully completed.	No action needed.
Invalid Character (*x*)[1]	A nonprintable ASCII character has been entered.	Re-enter information using valid characters.
Invalid – Data Terminal (or Channel) Initiated Loopback Active	Network-initiated loopback was in progress when another selection was made.	No action needed.
Invalid Password	Login is required and an incorrect password was entered; access is denied.	■ Try again. ■ Contact your system administrator to verify your password.
Invalid – [Test] Already Active	The [test] was already in progress when another selection was made.	■ Allow test to continue. ■ Select another test. ■ Stop the test.
Invalid Test Combination	A loopback or pattern test was in progress when Start was selected to start another test, or was active on the same or another interface when Start was selected.	■ Wait until other test ends and message clears. ■ Abort all tests from the Test menu screen. ■ Stop the test from the same screen the test was started from.

[1] *x* is the character not being accepted.

Table 8-1. Device Messages (2 of 2)

Device Message	What Message Indicates	What To Do
Limit of six Login IDs reached	An attempt to enter a new login ID was made, and the limit of six login/password combinations has been reached.	1. Delete another login/password combination. 2. Re-enter the new login ID.
No Security Records to Delete	Delete was selected from the Administer Login screen, and no security records had been defined.	■ No action needed. ■ Enter a security record.
Password Matching Error – Re-enter Password	Password entered in the Re-enter Password field of the Administer Logins screen does not match what was entered in the Password field.	■ Try again.
Please Wait	Command takes longer than 5 seconds.	Wait until message clears.
Test Active	A test is running and no higher priority health and status messages exist.	■ Contact service provider if test initiated by the network. ■ Wait until the test ends and message clears. ■ Cancel all tests from the Test screen. ■ Stop the test from the same screen the test was started from.

Troubleshooting

This DSU/CSU is designed to provide you with many years of trouble-free service. If a problem occurs, however, refer to Table 8-2 for possible solutions.

Table 8-2. Troubleshooting (1 of 2)

Symptom	Possible Cause	Solutions
Alarm LED is on.	One of several alarm conditions exists. Health and Status displays the alarm condition.	Refer to Table 6-2, Health and Status Messages, for recommended action.
Fail LED is on.	One of several error conditions exists. Health and Status displays the alarm condition.	Refer to Table 6-2, Health and Status Messages, and Table 6-3, Self Test Results Messages, for recommended action.
Cannot access the DSU/CSU via the ATI.	■ The terminal is not set up for the correct rate or data format, or the DSU/CSU is configured so it prevents access. ■ Telnet is not enabled	1. Check the cable and connections. 2. Set up your terminal or PC emulation as shown in *Connecting to the Terminal Port* in Chapter 2. 3. Power the DSU/CSU on and off and try again.
Device Fail appears on the System and Test Status screen under Self-Test results.	The DSU/CSU detects an internal hardware failure.	■ Select ClrStats from the status menu ■ Contact your service representative.
No power, or the LEDs are not lit.	The power cord is not securely plugged into the wall receptacle and into the rear panel connection.	Check that the power cord is securely attached at both ends.
	The wall receptacle has no power.	■ Check the wall receptacle power by plugging in some equipment that is known to be working. ■ Check the circuit breaker. ■ Verify that your site is not on an energy management program.
	Power supply has failed.	Replace power supply.
An LED is not lit.	LED is out.	Run the Lamp test. If the LED in question does not flash with the other LEDs, then contact your service representative.

Table 8-2. Troubleshooting (2 of 2)

Symptom	Possible Cause	Solutions
Not receiving data.	■ The network or data port cables are not connected (check front panel LEDs for more information). ■ A test is being executed on the unit (check the TEST LED on the front panel).	■ Check network and data port cables. ■ Run Loopback tests. Refer to Chapter 7, *Testing*. ■ Stop the test or wait for the test to end.
	■ The data port is not assigned to the network.	■ Check the Cross Connect Status screen. If the data port is not assigned to any network timeslots, use the Cross Connect Assignment screen (under the Config menu) to connect the port to the network.
	■ The far-end device is off-line.	■ Make sure the far-end device is on.
Power-Up Self-Test fails. Only Fail LED is on after power-up.	The DSU/CSU has detected an internal hardware failure.	■ Select ClrStats from the status menu ■ Contact your service representative.

Configuration Option Tables

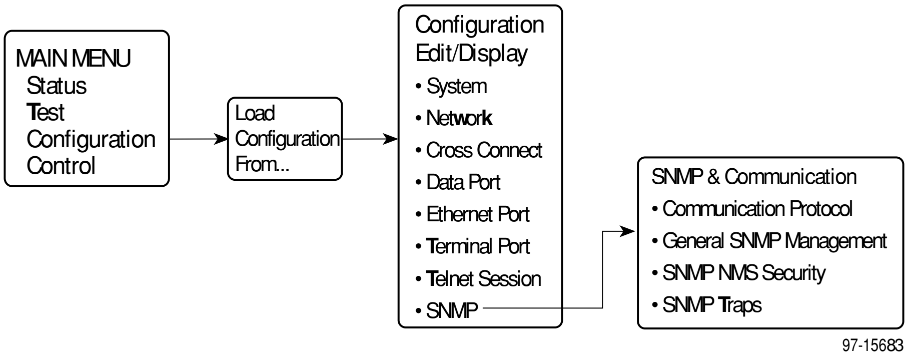
A

Overview

The tables in this appendix summarize the configuration options accessed when you select Configuration on the Main Menu. The configuration options are arranged into groups based upon functionality.

NOTE:

All changes to configuration options must be saved. Refer to *Saving Configuration Options* in Chapter 3.



Select . . .	To Access the . . .	To Configure the . . .
System	System Options, Table A-1	General system options
Network	Network Interface Options, Table A-2	T1 network interface
Cross Connect	Cross Connect Assignments, Table A-3	Cross connections between T1 DS0s and the data port
Data Port	Data Port Options, Table A-4	User data on DTE port
Ethernet Port	Ethernet Port Options, Table A-5	10BaseT
Terminal Port	Terminal Port Options, Table A-6	Terminal Port

Select . . .	To Access the . . .	To Configure the . . .
Telnet Port	Telnet Session Options, Table A-7	Telnet user interface
SNMP	■ General SNMP Management Options, Table A-8 ■ SNMP NMS Security Options, Table A-9 ■ SNMP Traps Options, Table A-10	Management support through SNMP

System Options Menu

For System Options, refer to Table A-1. To access the System Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From → System

Table A-1. System Options

Self Test
Possible Settings: **Enable**, **Disable** Default Setting: **Enable**
Controls whether or not the DSU/CSU performs a self-test at power-up and after reset. **Enable** – Self-test will be performed at power-up and after a reset. **Disable** – Self-test is disabled. The DSU/CSU will still perform a few basic tests (such as memory and program checksum).
Test Timeout
Possible Settings: **Enable**, **Disable** Default Setting: **Enable**
Allows user-initiated tests to end automatically. Recommend enabling when the unit is managed remotely through the FDL to avoid the requirement to terminate the test manually. **Enable** – User-initiated loopback and pattern tests end when test duration is reached. **Disable** – Tests can be terminated manually from the Network Tests screen. Refer to *Running Network Tests* in Chapter 7. NOTE: Tests commanded by the DTE or network-initiated tests are not affected by this test timeout.
Test Duration (min)
Possible Settings: **1–120** Default Setting: **10**
Number of minutes for a test to be active before automatically ending. ■ Test Duration (min) option appears when Test Timeout is enabled. **1 to 120** – Amount of time in minutes for a user-initiated test to run before terminating.

Network Interface Options Menu

For Network Interface Options, refer to Table A-2. To access the Network Interface Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From → Network

Table A-2. Network Interface Options (1 of 4)

Primary Clock Source
Possible Settings: **Network, Internal, Port** Default Setting: **Network**
Determines the primary source for the master clock. The source will provide all the timing within the DSU/CSU as well as the clocks for all external interfaces. **Network** – Master clock source is derived from the T1 network interface. **Internal** – Master clock source is the DSU/CSU internal clock. **Port** – Master clock source is derived from the data port. NOTE: If the selected primary clock source fails, the DSU/CSU automatically switches to use its internal clock.
Line Framing Format
Possible Settings: **ESF, D4** Default Setting: **ESF**
Specifies the framing format to be used on the network interface. **ESF** – Selects the Extended Superframe format. **D4** – Selects the D4 framing format.
Line Coding Format
Possible Settings: **B8ZS, AMI** Default Setting: **B8ZS**
Specifies the line coding format to be used on the network interface. **B8ZS** – Selects the Bipolar 8 Zero Suppression coding format. **AMI** – Selects the Alternate Mark Inversion coding format.

Table A-2. Network Interface Options (2 of 4)

Bit Stuffing
Possible Settings: **62411, Part68, Disable** Default Setting: **62411**
Specifies when bit stuffing is performed to meet the ones density requirements for data transmission on the network. You must choose the maximum number of consecutive zeros the DSU/CSU can receive before it inserts a one. **62411** – Specifies that a one is inserted in the data stream after 15 consecutive zeros or when the density of ones falls below 12.5% (complies with AT&T TR 62411). **Part68** – Specifies that a one is inserted in the data stream after 80 consecutive zeros (complies with FCC Part 68). **Disable** – Disables bit stuffing so that ones density is not enforced. NOTES: – To comply with Canadian DOC CS-03 regulations, equipment installed in Canada must be configured to select 62411. – To comply with USA Part 68 regulations, equipment installed in the USA must be configured to select Part 68. – This configuration option is only available if the network interface line coding format is set to AMI.
Line Build Out (LBO)
Possible Settings: **0.0, –7.5, –15, –22.5** Default Setting: **0.0**
Specifies the line build out (LBO) for the signal transmitted to the network.
FDL Management Link
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Specifies whether Facility Data Link (FDL) is enabled. Selecting Enable allows SNMP or Telnet traffic to flow over the 4 kbps data link provided by FDL. Running SNMP or Telnet over FDL requires an end-to-end FDL connection and cannot be terminated within the network. **Enable** – Enables the FDL management link for SNMP or Telnet. **Disable** – Disables the FDL management link. NOTES: – This configuration option is only available if the framing format is set to ESF. – If the local DSU/CSU's FDL is enabled, the remote DSU/CSU's FDL must also be enabled.
FDL IP Address
Possible Settings: **000.000.000.000 – 255.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the Internet Protocol address used to access the unit via the FDL. **000.000.000.000 – 255.255.255.255** – The range for the first byte is 000 to 255, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the FDL IP address and sets to all zeros.

Table A-2. Network Interface Options (3 of 4)

FDL Subnet Mask

Possible Settings: **000.000.000.000 – 255.255.255.255, Clear**
Default Setting: **000.000.000.000**

Specifies the subnet mask used to access the unit via the FDL interface.

000.000.000.000 – 255.255.255.255 – Set the FDL interface subnet mask. The range for each byte is 000 to 255.

Clear – Clears the FDL Subnet Mask and sets to all zeros. When the subnet mask is all zeros, the device creates a default subnet mask based on the class of IP address:

- Class A defaults to 255.000.000.000
- Class B defaults to 255.255.000.000
- Class C defaults to 255.255.255.000

Network Initiated Line Loopback (LLB)

Possible Settings: **Enable, Disable**
Default Setting: **Enable**

Allows initiation and termination of the LLB to be controlled by the receipt of LLB-actuate and LLB-release commands from the network (or remote DSU/CSU).

Enable – Causes the DSU/CSU to enter an LLB (if the DSU/CSU can perform an LLB in its current state) and to cause an LLB-release command to terminate the LLB.

Disable – Causes the DSU/CSU to ignore LLB-actuate and LLB-release commands (the DSU/CSU is not in compliance with ANSI T1.403 and AT&T TR 62411).

NOTE: If this configuration option is enabled, the DSU/CSU recognizes the in-band LLB-actuate and LLB-release codes specified by AT&T as well as the bit-oriented FDL messages specified by ANSI (for ESF only).

Network Initiated Payload Loopback (PLB)

Possible Settings: **Enable, Disable**
Default Setting: **Enable**

Allows initiation and termination of the PLB to be controlled by the receipt of PLB-actuate and PLB-release commands from the network (or remote DSU/CSU).

Enable – Causes the DSU/CSU to enter a PLB (if the DSU/CSU can perform a PLB in its current state) and to cause a PLB-release command to terminate the PLB.

Disable – Causes the DSU/CSU to ignore PLB-actuate and PLB-release commands (the DSU/CSU is not in compliance with ANSI T1.403 and AT&T TR 54016).

NOTES:

- If this configuration option is enabled, the DSU/CSU recognizes the in-band PLB-actuate and PLB-release codes specified by AT&T as well as the bit-oriented FDL messages specified by ANSI.
- This configuration option is only available if the network interface framing is set to ESF.

Table A-2. Network Interface Options (4 of 4)

ANSI Performance Report Messages
Possible Settings: **Disable, Enable** Default Setting: **Disable**
Specifies whether ANSI T1.403 compliant performance report messages (PRMs) are generated. **Disable** – Prevents the DSU/CSU from generating ANSI PRMs. **Enable** – Generates and sends ANSI PRMs over the FDL every second. NOTE: This configuration option is only available if the framing format is set to ESF.
Circuit Identifier
Possible Settings: **ASCII Text, Clear** Default Setting: [blank]
Uniquely identifies the DS1 circuit. **ASCII Text** – Enter a maximum of 15 characters. **Clear** – Clears the field.

Cross Connect Assignments

For Cross Connect Assignment Options, refer to Table A-3. To access the Cross Connect Assignments screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From →
Cross Connect

Table A-3. Cross Connect Assignments

Assign By
Available Settings: **Block, ACAMI, Channel** Default Setting: **Block**
Specifies the method for assigning the synchronous data port's DS0 channels to the network interface. **Block** – Allocates DS0 channels by the block method. **ACAMI** – Allocates DS0 channels by the Alternate Channel Alternate Mark Inversion method. The difference between block and ACAMI is that the number of channels allocated with ACAMI is double the number needed for the port rate. With ACAMI, every alternate DS0 channel does not carry data from the port but always transmits and receives all ones. **Channel** – Allocates DS0 channels by the individual channel method. NOTE: Changing this configuration option from one method to another (Block, ACAMI, or Channel) deallocates all DS0 channels assigned to the network interface.
Synchronous Data Port Assignments
Available Settings:**N01, N02, ..., N24** **P(*x*), P(*x*), ..., P(*x*)** Default Setting: **P(B) (all DS0's assigned to data port)**
Designates the assignment of DS0 channels connected to the synchronous data port. There are three rows in the assignment table. In each row, the top line displays channels (DS0's) for the network interface. The bottom line displays what whether that DS0 is available (unassigned) or connected to the synchronous data port. If connected to the synchronous data port, the value of P(*x*) specifies the assignment method used for the connection: Value – Meaning P(A) – This DS0 channel is allocated to the synchronous data port using the ACAMI method. P(B) – This DS0 channel is allocated to the synchronous data port using the Block method. P(C) – This DS0 channel is allocated to the synchronous data port using Channel method.

Data Port Options Menu

For Data Port Options, refer to Table A-4. To access the Data Port Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From → Data Port

Table A-4. Data Port Options (1 of 3)

Port Base Rate
Possible Settings: **Nx56, Nx64** Default Setting: **Nx64**
Allows selection of the base rate for the synchronous data port. The data rate for the port is a multiple (from 1 to 24) of the base rate specified with this configuration option. **Nx64** – Sets the base rate for this port to 64 kbps. The data rate is *N*x64 kbps, where *N* is a number from 1 to 24. **Nx56** – Sets the base rate for this port to 56 kbps. The data rate is *N*x56 kbps, where *N* is a number from 1 to 24.
Invert Transmit Clock
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Specifies whether the clock supplied by the DSU/CSU on the TXC interchange circuit DB (CCITT 114) is phase inverted with respect to the Transmitted Data interchange circuit BA (CCITT 103). This configuration option is useful when long cable lengths between the DSU/CSU and the DTE are causing data errors. **Disable** – Indicates TXC supplied by the DSU/CSU on this port is not phase inverted. **Enable** – Indicates TXC supplied by the DSU/CSU on this port is phase inverted.
Transmit Clock Source
Possible Settings: **Internal, External** Default Setting: **Internal**
Specifies whether the transmitted data for the synchronous data port is clocked using an internal clock provided by the DSU/CSU (synchronized to the clock source specified by the clock source configuration option) or an external clock provided by the DTE connected to the synchronous data port. If an external clock is used, it must be synchronized to the same clock source as the DSU/CSU. **Internal** – Indicates the clock is provided internally by the DSU/CSU on the TXC interchange circuit DB (CCITT 114). **External** – Indicates the clock is provided externally by the DTE on the XTXC interchange circuit DA (CCITT 113). Use this selection if the clock source is set to the data port.

Table A-4. Data Port Options (2 of 3)

Invert Transmit and Received Data
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Specifies whether the synchronous data port's transmitted data and received data are logically inverted before being transmitted or received. This configuration option is useful for applications where HDLC data is being transported. Inverting the data ensures that the density requirements for the network interface are met. **Disable** – Indicates the transmitted data and received data for this port are not inverted. **Enable** – Indicates the transmitted data and received data for this port are inverted.
Send All Ones on Data Port Not Ready
Possible Settings: **Disable, DTR, RTS, Both** Default Setting: **Both**
Specifies the conditions on the data port that determine when valid data is not being sent from the DTE. When this condition is detected, all ones are sent to the network on the DS0 channels allocated to the synchronous data port. **Both** – Monitors both DTR and RTS. If either is interrupted, all ones are sent to the network. **Disable** – Disables the monitoring of interchange circuits from the DTE connected to the synchronous data port. **DTR** – Monitors the DTE Ready interchange circuit CD (CCITT 108/1/2). When DTR is interrupted, all ones are sent to the network. **RTS** – Monitors the Request-to-Send interchange circuit CA (CCITT 105). When RTS is interrupted, all ones are sent to the network.
Action on Network Yellow Alarm
Possible Settings: **None**, **Halt** Default Setting: **Halt**
Specifies the action taken on the synchronous data port when a Yellow Alarm is received on the network interface. **Halt** – Stops the transmission of data on the data port and disables the data port when Yellow Alarms are received on the network interface. When Yellow Alarms are received, all ones are sent on the Received Data interchange circuit BB (CCITT 104). The Clear-to-Send interchange circuit CB (CCITT 106) is interrupted. **None** – Makes the data port unaffected by Yellow Alarms received on the network interface.

Table A-4. Data Port Options (3 of 3)

Network Init. Data Channel Loopback
Possible Settings: **Disable, V.54, FT1, Both** Default Setting: **Disable**
Allows the initiation and termination of a Data Channel Loopback (V.54 loop 2) by the receipt of a V.54 DCLB-actuate sequence or DCLB-release sequence from the network or far-end device. The sequences may be either V.54 or FT1 (ANSI) compliant sequences. **Disable** – Ignores the DCLB-actuate and DCLB-release sequences for this port. **V.54** – Enables DCLB-actuate and DCLB-release sequences that comply with the V.54 standard for ‘‘Inter-DCE signaling for point to point circuits.” **FT1** – Enables DCLB-actuate and DCLB-release sequences that comply with the ANSI T1.403, Annex B standard for ‘‘In-band signaling for fractional-T1 (FT1) channel loopbacks.” **Both** – Enables DCLB-actuate and DCLB-release sequences that comply with either the ANSI or V.54 standard. The type of actuate and release sequences do not have to match.
Port (DTE) Initiated Loopbacks
Possible Settings: **Disable, DTLB, DCLB, Both** Default Setting: **Disable**
Allows the initiation and termination of a local Data Terminal Loopback (DTLB) or remote Data Channel Loopback (DCLB) by the DTE connected to the synchronous data port. (DTLB is equivalent to a V.54 loop 3, and DCLB is equivalent to a V.54 loop 2.) Control of these loopbacks is through the DTE interchange circuits as specified by the V.54 standard. **Disable** – Disables control of local DTLBs and remote DCLBs by the DTE connected to this port. **DTLB** – Gives control of the local DTLBs for this port to the DTE attached to this port. This loopback is controlled by the Local Loopback interchange circuit LL (CCITT 141). **DCLB** – Gives control of the remote DCLBs for the far-end port connected to this port to the DTE attached to this port. This loopback is controlled by the Remote Loopback interchange circuit RL (CCITT 140). The far-end equipment must support in-band V.54 loopbacks. **Both** – Gives control of local DTLBs and remote DCLBs to the DTE connected to this port.

Ethernet Port Options Menu

For Ethernet Port Options, refer to Table A-5. To access the Ethernet Port Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From →
Edit → Ethernet Port

Table A-5. Ethernet Port Options (1 of 2)

Port Use
Possible Settings: **802.3, Version 2, Disable** Default Setting: **Version 2**
The Ethernet port provides a choice of functions. **802.3** – Configures the DSU/CSU to use IEEE 802.3 format. **Version 2** – Configures the system to use Ethernet Version 2 format. **Disable** – Data received on this port is ignored. ■ No other fields in this table will appear when set to Disable.
IP Address
Possible Settings: **000.000.000.000 – 255.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the IP (Internet Protocol) address used to identify the Ethernet port. Each three-digit decimal number represents a byte. **000.000.000.000 – 255.255.255.255** – Enter an address. The range for the first byte is 000 to 255, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP Address and sets to all zeros.
IP Subnet Mask
Possible Settings: **000.000.000.000 – 255.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the subnet mask needed to access the Ethernet port. **000.000.000.000 – 255.255.255.255** – Set the Ethernet port subnet mask. The range for each byte is 000 to 255. **Clear** – Clears the subnet mask and sets to all zeros. When the subnet mask is all zeros, the device creates a default subnet mask based on the class of IP address: – Class A defaults to 255.000.000.000 – Class B defaults to 255.255.000.000 – Class C defaults to 255.255.255.000

Table A-5. Ethernet Port Options (2 of 2)

Default Gateway Address
Possible Settings: **000.000.000.000 – 255.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the IP address of the default gateway to be used for packets that do not have a route. **000.000.000.000 – 255.255.255.255** – Enter an address. The range for the first byte is 000 to 255, with the exception of 127. The range for the remaining three bytes is 000 to 255. If the address is 000.000.000.000, all packets without a route are discarded. **Clear** – Clears the Default Gateway Address and sets to all zeros.

Terminal Port Options

For Terminal Port Options, refer to Table A-6. To access the Terminal Port Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From →
User Interface → Terminal Port

Table A-6. Terminal Port Options (1 of 3)

Data Rate (Kbps)
Possible Settings: **2.4, 4.8, 9.6, 14.4, 19.2, 28.8, 38.4** Default Setting: **9.6**
Data rate in kbps on the Terminal port. **2.4 to 38.4** – Selects a Terminal port data rate from 2.4 to 38.4 kbps.
Character Length
Possible Settings: **7, 8** Default Setting: **8**
Specifies the number of bits needed to represent one character, including the parity bit. **7 or 8** – Sets the bits per character.
Parity
Possible Settings: **None, Even, Odd** Default Setting: **None**
Specifies Parity for the Terminal port. **None** – Provides no parity. **Even** – Parity is even. **Odd** – Parity is odd.

Table A-6. Terminal Port Options (2 of 3)

Stop Bits
Possible Settings: **1**, **2** Default Setting: **1**
Provides the number of stop bits for the Terminal port. **1 or 2** – Selects the number of stop bits.
Monitor DTR/RTS
Possible Settings: **Enable**, **Disable** Default Setting: **Enable**
Specifies monitoring of the Data Terminal Ready (DTR) control lead. **Enable** – Standard operation of the DTR control lead. **Disable** – DTR is ignored. Some external device connections may require this setting.
Login Required
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Used to secure access to the ATI through the Terminal port. Login IDs are created with a password and access level. **Enable** – Security is enabled. When ATI access is attempted through the Terminal port, a screen appears that requires a Login ID and password. **Disable** – Main menu appears with no Login required. NOTE: Refer to *Creating a Login* in Chapter 4.
Port Access Level
Possible Settings: **Level 1**, **Level 2, Level 3** Default Setting: **Level 1**
The Terminal port access level is interrelated with the access level of the Login ID. **Level 1** – This is the highest access level. If Login Required is disabled, the Terminal port access is level 1. If Login Required is enabled, the effective level is the Login ID access level. **Level 2** – This access level overrides a Login ID with an access level 1. If a Login ID has an access level of 1 or 2, the effective access level is 2. If a Login ID has an access level of 3, the effective access level is 3. **Level 3** – This access level of the port is 3, regardless of the access level of the Login ID (overriding a Login ID with an access level of 1 or 2). NOTE: Refer to *ATI Access* in Chapter 4 for access level details.

Table A-6. Terminal Port Options (3 of 3)

Inactivity Timeout
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Provides automatic logoff of an ATI session through the Terminal Port. When the session is closed, User Interface Idle appears on the screen and the unit toggles the Terminal port DSR lead. **Enable** – The ATI session terminates automatically after the Disconnect Time set in the next option. When the session was occurring over an external modem connected to the Terminal port, the modem will interpret the DSR toggle as DTR being dropped and disconnect. **Disable** – An ATI session through the Terminal port will remain active indefinitely.
Disconnect Time (minutes)
Possible Settings: **range 1 – 60** Default Setting: **5**
Number of minutes of inactivity before the ATI session terminates automatically. Timeout is based on no keyboard activity. ■ Disconnect Time(minutes) option appears when Inactivity Timeout is enabled. **1 to 60** – The ATI user session is closed after the selected number of minutes.

Telnet Session Options

To access the Telnet Session Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From →
User Interface → Telnet Session

Table A-7. Telnet Session Options (1 of 2)

Telnet Session
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Specifies if the DSU/CSU will respond to a Telnet session request from a Telnet client on an interconnected IP network. **Enable** – Allows Telnet sessions between the unit and a Telnet client. **Disable** – No Telnet sessions allowed.

Table A-7. Telnet Session Options (2 of 2)

Login Required
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Used to secure access to the ATI through a Telnet session. Login IDs are created with a password and access level. Refer to *Creating a Login* in Chapter 4. **Enable** – Security is enabled. When access is attempted via Telnet, the user is prompted for a Login ID and password. **Disable** – No Login required for a Telnet session.
Session Access Level
Possible Settings: **Level 1, Level 2, Level 3** Default Setting: **Level 1**
The Telnet session access level is interrelated with the access level of the Login ID. **Level 1** – This is the highest access level. Access level is determined by the Login ID. If Login Required is disabled, the session access is level 1. **Level 2** – This access level overrides a Login ID with an access level 1. If a Login ID has an access level of 3, the effective access level is 3. **Level 3** – This access level provides the effective access level and overrides the access level of a Login ID. NOTE: Refer to *ATI Access* in Chapter 4 for access level details.
Inactivity Timeout
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Provides automatic logoff of a Telnet session. **Enable** – The Telnet session terminates automatically after the Disconnect Time set in the next option. **Disable** – A Telnet session will not be closed due to inactivity.
Disconnect Time (minutes)
Possible Settings: **range 1 – 60** Default Setting: **5**
Number of minutes of inactivity before a Telnet session terminates automatically. Timeout is based on no keyboard activity. ■ Disconnect Time (minutes) option appears when Inactivity Timeout is enabled. **1 to 60** – The Telnet session is closed after the selected number of minutes.

SNMP Menu

The SNMP Menu includes the following:

- General SNMP Management Options, Table A-8
- SNMP NMS Security Options, Table A-9
- SNMP Traps Options, Table A-10

General SNMP Management Options

To access the General SNMP Management Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From→
SNMP → General SNMP Management

Table A-8. General SNMP Management Options (1 of 2)

SNMP Management
Possible Settings: **Enable**, **Disable** Default Setting: **Disable**
Specifies if the DSU/CSU can be managed by an SNMP NMS or send out SNMP traps. **Enable** – Enables SNMP management. **Disable** – DSU/CSU does not respond to SNMP messages or send out SNMP traps.
Community Name 1
Possible Settings: **ASCII Text, Clear** Default Setting: **public**
Community Name of external SNMP Managers allowed access to the DSU/CSU’s MIB. This community name must be supplied by an external SNMP manager attempting to access a MIB object. Level of access is set in the next option, Name 1 Access. **ASCII Text** – Enter a maximum of 255 ASCII printable characters. **Clear** – Clears the Community Name 1 field.
Name 1 Access
Possible Settings: **Read, Read/Write** Default Setting: **Read**
Set the access level for the Community Name 1 created in the previous option. **Read** – Allows a read-only access (i.e., SNMP Get) to accessible MIB objects. **Read/Write** – Allows both an SNMP Get and Set to MIB objects. Write access allowed to all MIB objects specified as read-write in the MIB RFC.

Table A-8. General SNMP Management Options (2 of 2)

Community Name 2
Possible Settings: **ASCII Text, Clear** Default Setting: [blank]
Community Name of external SNMP Managers allowed access to the DSU/CSU's MIB. This community name must be supplied by an external SNMP manager attempting to access a MIB object. Level of access is set in the next option, Name 2 Access. **ASCII Text** – Enter a maximum of 255 ASCII printable characters. **Clear** – Clears the Community Name 2 field.
Name 2 Access
Possible Settings: **Read, Read/Write** Default Setting: **Read**
Set the access level for the Community Name 2 created in the previous option. **Read** – Allows a read-only access (i.e., SNMP Get) to accessible MIB objects. **Read/Write** – Allows both an SNMP Get and Set to MIB objects. Write access allowed to all MIB objects specified as read-write in the MIB RFC.

SNMP NMS Security Options

To access the SNMP NMS Security Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From → Edit → SNMP → SNMP NMS Security

Table A-9. SNMP NMS Security Options (1 of 2)

NMS IP Validation
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Determines if security checks are performed on the IP address of any SNMP management system that attempts to access the node. **Enable** – Performs security checking. Allows access only if the sending manager's IP address has been entered on the NMS IP address list below. **Disable** – No security checking of incoming SNMP messages.
Number of Managers
Possible Settings: **1, 2, 3, 4, 5, 6, 7, 8, 9, 10** Default Setting: **1**
Set the number of SNMP managers that are authorized to send SNMP messages. The IP address of each SNMP management system must be entered in the next option. **1 to 10** – Specifies the number of SNMP managers allowed to send SNMP messages.

Table A-9. SNMP NMS Security Options (2 of 2)

NMS *n* IP Address
Possible Settings: **000.000.000.000 – 255.255.255.255, Clear** Default Setting: **000.000.000.000**
Enter an IP address for each of the managers set in the previous option. *n* is the number of the manager (1 to 10). Use the next option to establish the security level for each SNMP manager. NOTE: When an SNMP message is received from an IP address that does not match the IP address entries in this option, access is denied and an “authenticationFailure” trap is generated. **000.000.000.000 – 255.255.255.255** – Sets the NMS IP address. The range for the first byte is 001 to 255, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP address and sets to all zeros.
Access Level
Possible Settings: **Read, Read/Write** Default Setting: **Read**
Set the access level for each IP address created in the previous option. **Read** – Allows a read-only access (SNMP Get) to accessible MIB objects. **Read/Write** – Allows both an SNMP Get and Set to MIB objects. Write access allowed to all MIB objects specified as read-write in the MIB RFC. This access level is overridden by the Community Name’s access level for the SNMP Manager, if the Community Name access level is Read.

SNMP Traps Options

To access the SNMP Traps Options screen, follow this menu selection sequence:

Main Menu → Configuration → Load Configuration From → Edit →
SNMP & Communication → SNMP Traps

Table A-10. SNMP Traps Options (1 of 2)

SNMP Traps
Possible Settings: **Enable, Disable** Default Setting: **Disable**
Controls the generation of SNMP trap messages. The options for addresses and types of traps are located in this table. ■ SNMP Management must be enabled in Table A-8. **Enable** – SNMP trap messages are sent out to SNMP managers. ■ If the destination is the Management port and an external device is attached to the Management port, the messages are sent immediately if there is an active connection. The destination is set with the Trap Manager Destination option. **Disable** – No SNMP trap messages are sent out.
Number of Trap Managers
Possible Settings: **1, 2, 3, 4, 5, 6** Default Setting: **1**
Sets the number of SNMP management systems that will receive SNMP traps. **1 to 6** – Number of trap managers. An NMS IP address is required for each manager.
Trap Manager *n* IP Address
Possible Settings: **000.000.000.000 – 255.255.255.255, Clear** Default Setting: **000.000.000.000**
Specifies the Internet Protocol address used to identify each SNMP trap manager. *n* represents the number of the manager (from 1 to 6). **000.000.000.000 – 255.255.255.255** – Enter an address for each SNMP trap manager. The range for the first byte is 000 to 255, with the exception of 127. The range for the remaining three bytes is 000 to 255. **Clear** – Clears the IP address and sets to all zeros.
Trap Manager *n* Destination
Possible Settings: **None, Ethernet, FDL** Default Setting: **None**
Provides the network destination path of each trap manager. *n* is the number of the manager (from 1 to 6). **None** – No network destination is defined. **Ethernet** – The Ethernet port is the network destination. **FDL** – The Facility Data Link Channel is the default network destination. ■ FDL Management Link option must be enabled in Table A-2.

Table A-10. SNMP Traps Options (2 of 2)

General Traps
Possible Settings: **Disable, Warm, AuthFail, Both** Default Setting: **Both**
Determines which SNMP traps are sent to each trap manager. **Disable** – No general trap messages are sent. **Warm** – Sends trap message for “*warmStart”*. **AuthFail** – Sends trap message for “*authenticationFailure*”. **Both** – Sends both trap messages. NOTE: Refer to Appendix D, *Standards Compliance for SNMP Traps*.
Enterprise Specific Traps
Possible Settings: **Enable, Disable** Default Setting: **Disable**
This option is used to determine if SNMP traps are generated for enterprise-specific events. **Enable** – SNMP traps are generated for enterprise-specific events. NOTE: Refer to *Traps: enterpriseSpecific* in Appendix D. **Disable** – No enterprise-specific event traps are sent.
Link Traps
Possible Settings: **Disable, Up, Down, Both** Default Setting: **Both**
This option is used to determine if SNMP traps are generated for link up and link down for one of the communication interfaces. **Disable** – No linkUp or linkDown SNMP traps are generated. **Up** – A linkUp trap is generated when the DSU/CSU recognizes that one of the communication interfaces is operational. **Down** – A linkDown trap is generated when the DSU/CSU recognizes a failure in one of the communication interfaces. **Both** – Sends trap messages for detection of both linkUp and linkDown. NOTE: Refer to *Traps: linkUp and linkDown* in Appendix D.
Link Trap Interfaces
Possible Settings: **Network, Port, Both** Default Setting: **Both**
This option determines if the SNMP linkUp, SNMP linkDown, and interface-related enterprise-specific traps are generated for the Network T Interface and/or User Data (DTE) port. NOTE: These traps are not supported on the Management port and Terminal port. **Network** – SNMP trap messages are generated for the network T1 interface. **Port** – SNMP trap messages are generated for the User Data (DTE) port. **Both** – SNMP trap messages are generated on both the network T1 interface and the User Date (DTE) port.

Worksheets

B

Overview

The worksheets in this appendix summarize the configuration options accessed when you select Configuration on the Main Menu. The possible menu selections are displayed with the default settings and the possible settings.

Configuration Worksheets

System	
Configuration Option	**Settings** (default in **Bold)**
Self Test	**Enable**, Disable
Test Timeout	**Enable,** Disable
Test Duration (min)	1–120 [**10**]

Network Interface	
Configuration Option	**Settings** (default in **Bold)**
Primary Clock Source	**Network**, Internal, Port
Line Framing Format	**ESF,** D4
Line Coding Format	**B8ZS,** AMI
Bit Stuffing	**62411,** Part68, Disable
Line Build Out (LBO)	**0.0**, –7.5, –15, –22.5
FDL Management Link	Enable, **Disable**
FDL IP Address	**000.000.000.000** – 255.255.255.255, clear
FDL Subnet Mask	**000.000.000.000 –** 255.255.255.255, clear – Class A defaults to 255.000.000.000 – Class B defaults to 255.255.000.000 – Class C defaults to 255.255.255.000
Network Initiated Line Loopback (LLB)	**Enable,** Disable
Network Initiated Payload Loopback (PLB)	**Enable,** Disable
ANSI Performance Report Messages	**Disable,** Enable
Cross Identifier	**<Blank>**

Cross Connect Assignments	
Configuration Option	**Settings** (default in **Bold)**
Assign By	**Block,** ACAMI, Channel
Synchronous Data Port Assignments The default is all DSOs assigned to the data port.	P(B)
	...
	P(B)

Cross Connect Assignments

Configuration Option	**Settings** (default in **Bold)**
Synchronous Data Port Assignments The default is that all DS0s are assigned to the data port.	N01
	N02
	N03
	N04
	N05
	N06
	N07
	N08
	N09
	N10
	N11
	N12
	N13
	N14
	N15
	N16
	N17
	N18
	N19
	N20
	N21
	N22
	N23
	N24

Data Port

Configuration Option	**Settings** (default in **Bold)**
Port Base Rate	**Nx64,** Nx56
Invert Transmit Clock	Enable, **Disable**
Transmit Clock Source	**Internal,** External
Invert Transmit and Received Data	Enable, **Disable**
Send All Ones on Data Port Not Ready	Disable, DTR, RTS, **Both**
Action on Network Yellow Alarm	None, **Halt**

Data Port

Configuration Option	**Settings** (default in **Bold)**
Network Init. Data Channel Loopback	**Disable,** V.54, FT1, Both
Port (DTE) Initiated Loopbacks	**Disable,** DTLB, DCLB, Both

Ethernet Port

Configuration Option	**Settings** *Default in [**Bold**]*
Port Use	802.3, **Version 2**, Disable
IP Address	[**000.000.000.000**] – 255.255.255.255
IP Subnet Mask	**[000.000.000.000**] – 255.255.255.255
Default Gateway Address	[**000.000.000.000**] – 255.255.255.255

Terminal Port

Configuration Option	**Settings** (default in **Bold)**
Data Rate (Kbps)	2.4, 4.8, **9.6**, 14.4, 19.2, 28.8, 38.4
Character Length	7, **8**
Parity	**None**, Even, Odd
Stop Bits	**1**, 2
Monitor DTR/RTS	**Enable**, Disable
Login Required	Enable, **Disable**
Port Access Level	**Level 1**, Level 2, Level 3
Inactivity Timeout	Enable, **Disable**
Disconnect Time (minutes)	range 1 – 60, **5**

Telnet Session

Configuration Option	**Settings** (default in **Bold)**
Telnet Session	Enable, **Disable**
Login Required	Enable, **Disable**
Session Access Level	**Level 1**, Level 2, Level 3
Inactivity Timeout	Enable, **Disable**
Disconnect Time (minutes)	range 1 – 60, **5**

SNMP	
Configuration Option	**Settings** (default in **Bold)**
General SNMP Management	
SNMP Management	Enable, **Disable**
Community Name 1	ASCII Text, **Public**
Name 1 Access	**Read**, Read/Write
Community Name 2	ASCII Text
Name 2 Access	**Read**, Read/Write
SNMP NMS Security	
NMS IP Validation	Enable, **Disable**
Number of Managers	**1**, 2, 3, 4, 5, 6, 7, 8, 9, 10
NMS *n* IP Address	**000.000.000.000** – 255.255.255.255 (first byte cannot be 127)
Access Level	**Read**, Read/Write
SNMP Traps	
SNMP Traps	Enable, **Disable**
Number of Trap Managers	**1**, 2, 3, 4, 5, 6
Trap Manager *n* IP Address	**000.000.000.000** – 255.255.255.255
Trap Manager *n* Destination	**None,** Ethernet, FDL
General Traps	Disable, Warm, AuthFail, **Both**
Enterprise Specific Traps	Enable, **Disable**
Link Traps	Disable, Up, Down, **Both**
Link Trap Interfaces	Network, Port, **Both**

MIB Descriptions

C

Overview

The MIB descriptions listed here provide clarification for the MIB objects when it is not clear how the object definition in the applicable RFC is related to the unit. Otherwise, the MIB object is supported as documented in the RFC. The 7112 SNMP DSU/CSU supports:

- MIB II (RFC 1213 and RFC 1573)
- DS1/E1 MIB (RFC 1406)
- Ethernet-like MIB (RFC 1643)
- RS-232-Like MIB (RFC 1659)
- Generic Interface Extension MIB (RFC 1229)
- Enterprise MIB

MIB II – RFC 1213 and RFC 1573

The unit supports the following MIB II object groups as defined in RFC 1213 and RFC 1573:

- System Group Objects, Table C-1
- Interfaces Group Objects – Supported for the T1 network interface, User Data (DTE) port, Terminal port, and the FDL as defined in RFC 1573, the Evolution of the Interfaces Group.
  - Interfaces Group Objects, Table C-2
  - Extension to Interface Table (ifXTable), Table C-3
  - Interface Stack Group Objects, Table C-4
- IP Group Objects, Table C-5
- ICMP (Internet Control Management Protocol) Group
- TCP (Transmission Control Protocol) Group
- UDP (User Datagram Protocol) Group

- Transmission Group Objects. Supported on the:
  - — DS1 network interface using the DS1 Enterprise MIB.
  - — User Data (DTE) port and Terminal port using the RS-232-like MIB.
  - — 10BaseT port using the Ethernet-like MIB.
- SNMP Group

The following MIB II groups are not supported:

- Address Translation Group
- Exterior Gateway Protocol (EGP) Group
- Generic Receive Address Table

System Group

System Group objects are fully supported by the unit.

Table C-1. System Group Objects (1 of 2)

Object, OID, Access	Description	Setting/Contents
sysDescr *(system 1)* 1.3.6.1.2.1.1.1 read-only	Provides a full name and version identification for the system's hardware and software.	PARADYNE T1 DSU/CSU*;* Model: 7112-*xx-xxx*; S/W Release: *yy.yy.yy;* H/W CCA number: *zzzz-zzz;* Serial number: *sssssss*
sysObjectID *(system 2)* 1.3.6.1.2.1.1.2 read-only	Identifies the network management subsystem.	1.3.6.1.4.1.1795.1.14.2.5.2
sysUptime *(system 3)* 1.3.6.1.2.1.1.3 read-only	Identifies the length of time since last unit IPL.	Days, hours, minutes, and seconds since last IPL.
sysContact *(system 4)* 1.3.6.1.2.1.1.4 read-write	Provides the textual identification of the contact person for this managed unit.[1]	ASCII character string, as set by the user.
sysName *(system 5)* 1.3.6.1.2.1.1.5 read-write	Provides an administratively-assigned name for this managed unit.[1]	ASCII character string, as set by the user.
sysLocation *(system 6)* 1.3.6.1.2.1.1.6 read-write	Provides the physical location for this managed unit.[1]	ASCII character string, as set by the user.

Table C-1. System Group Objects (2 of 2)

Object, OID, Access	Description	Setting/Contents
sysServices *(system 7)* 1.3.6.1.2.1.1.7 read-only	Functionality supported: ▪ **physical (1)** – Layer 1 functionality for all interfaces. ▪ **datalink/subnetwork (2)** – Layer 2 functionality (SLIP/PPP) for all management links. ▪ **internet (4)** – Layer 3 functionality (IP) for all management links. ▪ **end-to-end (8)** – Layer 4 functionality (TCP/UDP) for all management links.	Object is set to 1+2+4+8 (**15**).

Interfaces Group

The Interfaces Group as defined in RFC 1573 consists of an object indicating the number of interfaces supported by the unit and an interface table containing an entry for each interface. Since RFC 1573 is an SNMPv2 MIB, it is converted to SNMPv1 for support by the unit. The following table provides clarification for objects contained in the Interfaces group when it is not clear how the object definition in RFC 1573 is supported by the unit.

Table C-2. Interfaces Group Objects (1 of 5)

Object	Description	Setting/Contents
ifNumber *(interfaces 1)* 1.3.6.1.2.1.2.1	Specifies the number of interfaces for this unit in the ifTable.	**5**
ifIndex *(ifEntry 1)* 1.3.6.1.2.1.2.2.1.1	Provides the index to the interface table (ifTable) and to other tables as well. When an unsupported index is entered (e.g., 1 and 5), noSuchName is returned.	Indexes and values: **1** – reserved **2** – Terminal port **3** – Ethernet port **4** – Network (T1) interface **5** – reserved **6** – User Data (DTE) port **8** – FDL

Table C-2. Interfaces Group Objects (2 of 5)

Object	Description	Setting/Contents
ifDescr *(ifEntry 2)* 1.3.6.1.2.1.2.2.1.2	Supplies text for each Interface:	Text Strings for each interface:
	■ Terminal	■ "Terminal Port; PARADYNE DS1 Leased Line DSU/CSU; Hardware Version [*Hardware Revision*]"
	■ Ethernet	■ "Ethernet Port; PARADYNE DS1 Leased Line DSU/CSU; Hardware Version [*Hardware Revision*]"
	■ DS1 Network	■ "DS1 Network; PARADYNE DS1 Leased Line DSU/CSU; Hardware Version [*Hardware Revision*]"
	■ User Data Port	■ "User Data Port; PARADYNE DS1 Leased Line DSU/CSU; Hardware Version [*Hardware Revision*]"
	■ FDL	■ "FDL Channel; PARADYNE DS1 Leased Line DSU/CSU; Hardware Version [*Hardware Revision*]"
ifType *(ifEntry 3)* 1.3.6.1.2.1.2.2.1.3	Identifies the interface type based on the physical/link protocol(s), right below the network layer.	Supported values: ■ **ethernetCsmacd(6)** – Used for the Ethernet port. ■ **other(1)** – Used for the DS1 network. ■ **SLIP(28**) – Used for the FDL connection ■ **rs232(33)** – Used for the Terminal port. ■ **v35(45)** – Used for the User Data port. ■ **DS1(18)** – Used for the Network and DTE Drop/Insert T1 interfaces.
ifMtu *(ifEntry 4)* 1.3.6.1.2.1.2.2.1.4	Identifies the largest datagram that can be sent or received on an interface (Ethernet port or FDL).	Number of octets.

Table C-2. Interfaces Group Objects (3 of 5)

Object	Description	Setting/Contents
ifSpeed *(ifEntry 5)* 1.3.6.1.2.1.2.2.1.5	Provides the current bandwidth for the interface in bits per second.	■ Ethernet Port – The data rate for the port. ■ Terminal port – Configured data rate for the port. ■ DS1 – Line rate of 56,000 or 64,000 bps, reflecting the line rate detected by the unit. ■ User data (DTE) port – Current data rate of the port (DS1 operating rate minus FDL). ■ Facility Data Link – When FDL is enabled, the data rate is 4 Kbps. When FDL is disabled, the data rate is zero.
ifAdminStatus *(ifEntry 7)* 1.3.6.1.2.1.2.2.1.7	Provides interface status. Supported as read-only.	■ **up(1)** – The interface is enabled. ■ **down(2)** – The interface is disabled. ■ Ethernet Port – always **down(2)**. ■ Terminal port – always **up(1)**. ■ User data (DTE) port – always **up(1)**. ■ DS1 Network – always **up(1)**. ■ Facility Data Link – **Up(1)** when FDL enabled, **down(2)** when FDL disabled.

Table C-2. Interfaces Group Objects (4 of 5)

Object	Description	Setting/Contents
ifOperStatus *(ifEntry 8)* 1.3.6.1.2.1.2.2.1.8	Specifies the current operational state of the interface. Read/Write	■ Ethernet port – **up(1)** – No alarms – **down(2)** – Alarms – **testing(3)** – Test active ■ Terminal port. Always **up(1)**; never in **testing(3)** state. ■ User Data Port – **up(1)** – No alarms – **down(2)** – Alarms – **testing(3)** – Test active ■ DS1 Network Interface – **up(1)** – DTR on, if supported by the DTE – **down(2)** – DTR off, if supported by the DTE – **testing(3)** – Test active ■ Facility Data Link (FDL). When enabled, up and down are based on the current state of the physical and link layer protocols. – **up(1)** – Operational and no active test on the DS1 network interface – **down(2)** – Not operational or disabled – **testing(3)** – Test active on DS1 network interface
ifLastChange *(ifEntry 9)* 1.3.6.1.2.1.2.2.1.9	Indicates the amount of time the interface has been up and running.	Contains the value of sysUpTime object at the time the interface entered its current operational state.
ifInOctets *(ifEntry 10)* 1.3.6.1.2.1.2.2.1.10	Collects input statistics on data received by the interface. Applies to the FDL and the Ethernet port. Statistics are not collected if the Ethernet port is disabled.	An integer number.
ifInUcastPkts *(ifEntry 11)* 1.3.6.1.2.1.2.2.1.11		
ifInDiscards *(ifEntry 13)* 1.3.6.1.2.1.2.2.1.13		
ifInErrors *(ifEntry 14)* 1.3.6.1.2.1.2.2.1.14		
ifInUnknown Protos *(ifEntry 15)* 1.3.6.1.2.1.2.2.1.15		

Table C-2. Interfaces Group Objects (5 of 5)

Object	Description	Setting/Contents
ifOutOctets *(ifEntry 16)* 1.3.6.1.2.1.2.2.1.16	Collects output statistics on data received by the interface. Applies to the FDL and the Ethernet port. Statistics are not collected if the Ethernet port is disabled.	An integer number.
ifOutUcastPkts *(ifEntry 17)* 1.3.6.1.2.1.2.2.1.17		
ifOutDiscards *(ifEntry 19)* 1.3.6.1.2.1.2.2.1.19		
ifOutErrors *(ifEntry 20)* 1.3.6.1.2.1.2.2.1.20		

Extension to Interface Table (ifXTable)

This extension contains additional objects for the interface table. Supports only the following objects.

Table C-3. Extension to Interface Table (ifXTable) (1 of 2)

Object, OID, Access	Description	Setting/Contents
ifName *(ifXEntry 1)* 1.3.6.1.2.1.31.1.1.1.1 read-only	Provides name of the interface.	Interface text strings: ■ Ethernet Port ■ Terminal Port ■ Network ■ Data Port ■ FDL
ifLinkUpDown-TrapEnable *(ifXEntry 14)* 1.3.6.1.2.1.31.1.1.1.14 read-write	Indicates whether the link is up or down, or enterprise-specific traps should be generated.	Only supports T1 network and User data port. SNMP Traps must be enabled for the unit. See Table A-10, SNMP Traps Option.

Table C-3. Extension to Interface Table (ifXTable) (2 of 2)

Object, OID, Access	Description	Setting/Contents
ifHighSpeed *(ifXEntry 15)* 1.3.6.1.2.1.31.1.1.1.15 read-only	Reflects the ifSpeed setting for the interface. Supported as a read-only variable.	This object is supported for the Ethernet Network T1 and User Data Port only. **0** – ifSpeed from 0 to 499,999 bps **1** – ifSpeed from 500,000 to 1, 499,999 bps **2** –ifSpeed from 1,500,000 to 1, 536,000 bps **10** – ifSpeed from 4999,000 to 10,499,000 bps
ifConnectorPresent *(ifXEntry 17)* 1.3.6.1.2.1.31.1.1.1.17 read-only	Indicates whether there is a physical connector for the interface.	**true(1)** – Will always have this value for the Network T1, User Data port. **false(2)** –Will always have this value for the FDL.

Interface Stack Group

The Interface Stack Group is used by the unit to show the relationship between a logical interface and a physical interface. The following table provides clarification for objects contained in the Interface Stack group when it is not clear how the object definition in RFC 1573 is supported by the unit.

Table C-4. Interface Stack Group Objects (1 of 2)

Object, OID, Access	Description	Setting/Contents
ifStackHigherLayer *(ifStackEntry1)* 1.3.6.1.2.1.31.1.2.1.1 read-only	Provides the index that corresponds to the higher sublevel specified by ifStackLowerLayer.	When the FDL in-band management channel is enabled, this object for the network T1 interface is set to the ifIndex of the FDL. All other ifStackHigherLayer objects will have a value of zero.
ifStackLowerLayer *(ifStackEntry2)* 1.3.6.1.2.1.31.1.2.1.2 read-only	Provides the index that corresponds to the lower sublevel specified by ifStackHigherLayer.	When the FDL in-band management channel is enabled, this object (for the FDL) is set to the ifIndex of the network T1 interface. All other ifStackLowerLayer objects will have a value of zero.

Table C-4. Interface Stack Group Objects (2 of 2)

Object, OID, Access	Description	Setting/Contents
ifStackStatus *(ifStackEntry3)* 1.3.6.1.2.1.31.1.2.1.3 read-only	Specifies the stack group's status compared to the interface's ifOperStatus.	■ When ifStackStatus set to **active** – maps to ifOperStatus set to **up(1)** or **testing(3)**. ■ When ifStackStatus set to **not in service** – maps to ifOperStatus set to **down(2)**.

Interface Test Table

Not supported by the unit.

Generic Receive Address Table

Not supported by the unit.

IP Group

The Internet Protocol Group objects are supported by the unit for all data paths that are currently configured to carry IP data to/from the unit. All of the objects in the IP Group, except for the IP Address Translation table, are fully supported. The following table provides clarification for objects contained in the IP group when it is not clear how the object definition in MIB II is supported by the unit.

Table C-5. IP Group Objects (1 of 3)

Object, OID, Access	Description	Setting/Contents
ipForwarding *(ip1)* 1.3.6.1.2.1.4.1 read-write	Specifies whether the unit is acting as an IP gateway for forwarding of datagram received by, but not addressed to, the unit.	Supports only the following value: ■ **forwarding(1)** – The unit is acting as a gateway.
ipAddrTable *(ip20)* 1.3.6.1.2.1.4.20 read-only	The address table.	Supported.
ipAdEntAddr *(ipAddrEntry 1)* 1.3.6.1.2.1.4.20.1.1 read-only	An IP address supported by the unit which serves as an index to the address table.	Indexes for tables must be unique. Therefore, only one ifIndex can be displayed for each IP address supported by the device. If the same IP address is configured for multiple interfaces, or for default IP addresses, the ipAddrTable will not display all of the interfaces that support a particular IP address.

Table C-5. IP Group Objects (2 of 3)

Object, OID, Access	Description	Setting/Contents
ipAdEntIfIndex *(ipAddrEntry 2)* 1.3.6.1.2.1.4.20.1.2 read-only	If this object has a greater value than the ifNumber, then it refers to a proprietary interface not currently implemented by the MIB II Interface Group.	None
ipRouteTable *(ip21)* 1.3.6.1.2.1.4.21 read-write	Use caution when adding or modifying routes. If it is absolutely necessary to add a route, the route should only be added to the connected device (device closest to the destination). Internal routing will continue the route to the other devices.	To delete a route, set object to **invalid**. To modify a route, change fields in the desired entry of the routing table (indexed by ipRouteDest). To add a route, specify values for a table entry for which the index (ipRouteDest) does not already exist. *The following objects must be specified*: ■ ipRouteDest – Serves as an index to the routing table. Only one route per destination can appear in the table. To ensure that no duplicate destinations appear in the routing table, the ipRouteDest object will be treated as described in the IP Forwarding Table MIB (RFC 1354). ■ ipRouteIfIndex – If this object has a greater value than the ifNumber, then it refers to a proprietary interface not currently implemented by the MIB II Interface Group. Do not delete route entries with an unrecognized ipRouteIfIndex. When setting this object via SNMP, the ipRouteIfIndex value can only assume an appropriate value of IfIndex defined for a particular device type. Objects that will be set to the default value if not specified in the Set PDU used to add a route: ■ ipRouteMetric1 – Defaults to 1 hop. ■ ipRouteType – Defaults to indirect. ■ ipRouteMask – Defaults to what is specified in the MIB description. *Continued on next page.*

Table C-5. IP Group Objects (3 of 3)

Object, OID, Access	Description	Setting/Contents
ipRouteTable *(ip21)* (Continued)		Objects that are not used by this unit: ▪ ipRouteMetric2, ipRouteMetric3, ipRoutemetric4, ipRoutemetric5 – Default to **–1**. ▪ ipRouteNextHop – Defaults to **0.0.0.0**. *Do not specify the following* read-only objects in the Set PDU used to add a route: ▪ ipRouteProto – Set to **netmgmt(3**) by the software. ▪ ipRouteAge – Reflects the value of the time-to-live for the route (in seconds). Defaults to **999** (permanent route). ▪ ipRouteInfo – Unused; set to {0, 0}.

ICMP Group

The ICMP (Internet Control Management Protocol) Group objects are fully supported.

TCP Group

The TCP Group objects are fully supported, with the exception of tcpConnState object, which will be read-only, since deleteTCB (12) is not supported and is the only value which can be set.

UDP Group

The UDP Group objects are fully supported.

Transmission Group

Objects in the Transmission Group are supported on the T1 network interface, User Data port and Terminal port. These objects are defined through other Internet-standard MIB definitions rather than within MIB II.

Table C-6. Transmission Group Objects

Object	Description
dot3 *(transmission 7)*	Supported on the Ethernet port. Defined by the Ethernet-like MIB (RFC 1643).
rs232 *(transmission 33)*	Supported on the User Data port and Terminal port. Defined by the RS-232-like MIB (RFC 1659).
ds1 (transmission 18)	Supported on the DS1 network interface by Paradyne Enterprise MIB.

SNMP Group

The SNMP Group objects that apply to a management agent are fully supported. The following objects apply only to an NMS and return a zero value if accessed.

- snmpInTooBig (snmp 8)
- snmpInNoSuchNames (snmp 9)
- snmpInBadValues (snmp 10)
- snmpInReadOnlys (snmp 11)
- snmpInGenErrs (snmp 12)
- snmpInGetResponses (snmp 18)
- snmpInTraps (snmp 19)
- snmpOutGetRequests (snmp 25)
- snmpOutGetNexts (snmp 26)
- snmpOutSetRequests (snmp 27)

DS1/E1 – RFC 1406

The unit supports DS1/E1 MIB, RFC 1406 for the T1 network interface. The DS1 Near End Group and DS1 Fractional Group are supported for this interface. The DS1 Near End Group consists of the following tables:

- DS1 Configuration, Table C-7
- DS1 Current, Table C-8
- DS1 Interval, Table C-9
- DS1 Total, Table C-10

The DS1 Far End Group is not supported.

All four tables are supported for the T1 network interface. Clarification for objects contained in the tables as it applies to the unit is provided below.

The DS1 Far End Group is not supported.

DS1 Near End Group Configuration Table Objects

The DS1 Near End Group Configuration Table Objects contains configuration options for the DS1/E1 interfaces. Clarification for objects contained in this table as it applies to the unit is provided below.

Table C-7. DS1 Near End Group Configuration Table Objects (1 of 4)

Object, OID, Access	Description	Setting/Contents
dsx1TimeElapsed *(dsx1ConfigEntry 3)* 1.3.6.1.2.1.1.10.18.6.1.3 read-only	The number of seconds that have elapsed since the start of the current error-measurement period. Applies to the T1 network interface only.	Supports the following values: ■ 0 to 899.
dsx1ValidIntervals *(dsx1ConfigEntry 4)* 1.3.6.1.2.1.1.10.18.6.1.4 read-only	Contains the number of previous intervals for which valid data was collected. Applies to the T1 network interface only.	Supports the following values: ■ 0 to 96. The value is **96** unless the interface was brought online within the last 24 hours, in which case the value will be the number of complete 15 minute intervals since the interface has been online.
dsx1LineType *(dsx1ConfigEntry 5)* 1.3.6.1.2.1.1.10.18.6.1.5 read-write	Corresponds to the network framing configuration option for the network interface on the DSU/CSU.	Supports the following values: ■ **dsx1ESF(2)** – Indicates ESF framing. ■ **dsx1D4(2)** – Indicates D4 framing.

Table C-7. DS1 Near End Group Configuration Table Objects (2 of 4)

Object, OID, Access	Description	Setting/Contents
dsx1LineCoding *(dsx1ConfigEntry 6)* 1.3.6.1.2.1.1.10.18.6.1.6 read-write	Corresponds to the network line coding configuration option for the network interface on the DSU/CSU.	Supports the following values: ■ **dsx1B8ZS(2)** – Indicates B8ZS line coding. ■ **dsx1AMI(5)** – Indicates AMI line coding.
dsx1SendCode *(dsx1ConfigEntry 7)* 1.3.6.1.2.1.1.10.18.6.1.7 read-write	Indicates the test patterns/codes being sent over the network interface.	Supports the following values: ■ **dsx1SendNoCode(1)** – specifies that the interface is sending normal or looped data. Setting the interface to this value stops an active “send pattern” test on the interface. ■ **dsx1SendLineCode(2)** – specifies that the network interface is sending a Remote Loopback UP code for 10 seconds. ■ **dsx1SendResetCode(4)** – specifies that the network interface is sending a Remote Loopback DOWN code for 10 seconds. ■ **dsx1SendQRS(5)** – specifies that the network interface is sending a QRSS test pattern. The pattern is sent until the test is halted (i.e., setting to dsx1SendNoCode). ■ **dsx1SendOtherTestPattern(8)** – specifies that the network interface is sending a 1-in-8 test pattern. The pattern is sent until the test is halted (i.e., setting to dsx1SendNoCode).
dsx1CircuitIdentifier *(dsx1ConfigEntry 8)* 1.3.6.1.2.1.1.10.18.6.1.8 read-write	Contains the transmission vendor’s circuit identifier, for the purpose of facilitating troubleshooting. Applies to the T1 network interface only.	A string of 0 to 255 characters.

Table C-7. DS1 Near End Group Configuration Table Objects (3 of 4)

Object, OID, Access	Description	Setting/Contents
dsx1LoopbackConfig *(dsx1ConfigEntry 9)* 1.3.6.1.2.1.1.10.18.6.1.9 read-write	This object specifies the loopback state of the network interface. Applies to the T1 network interface only.	Supports the following values: ■ **dsx1NoLoop(1)** – The T1 interface is not in a loopback state. ■ **dsx1PayloadLoop(2)** – Specifies that a Payload Loopback (PLB) is active for the network interface. ■ **dsx1LineLoop(3)** – Specifies that a Line Loopback (LLB) is active for the network interface. ■ **dsx1OtherLoop(4)** – Specifies that an unspecified type of loopback is active for the network interface.
dsx1LineStatus *(dsx1ConfigEntry 10)* 1.3.6.1.2.1.1.10.18.6.1.10 read-only	This object specifies the line (alarm) status of the network interface.	More than one value may be active at a time. Supports the following values: ■ **dsx1NoAlarm(1)** – No alarm present. ■ **dsx1RcvFarEndLOF(2)** – A yellow alarm signal is being received. ■ **dsx1RcvAIS(8)** – An Alarm Indication Signal (AIS) is being received. ■ **dsx1LossOfFrame(32**) – An Out Of Frame condition has persisted for more than 2.5 seconds (i.e., Red Alarm). ■ **dsx1LossOfSignal(64)** – A Loss of Signal condition has persisted for more than 2.5 seconds (i.e., Red Alarm). ■ **dsx1LoopbackState(128)** – The near end of the network interface is in a loopback state. ■ **dsx1Other Failure(4096)** – An Excessive Error Rate (EER) has been detected on the network interface.

Table C-7. DS1 Near End Group Configuration Table Objects (4 of 4)

Object, OID, Access	Description	Setting/Contents
dsx1SignalMode *(dsx1ConfigEntry 11)* 1.3.6.1.2.1.1.10.18.6.1.11 read-only	This object specifies whether Robbed Bit Signaling (RBS) is being used. This object differs from the MIB definition in that it is not read/write. RBS is not supported in this product.	Supports the following value: ■ **none(1)** – No signaling is being used on this interface.
dsx1TransmitClock–Source *(dsx1ConfigEntry 12)* 1.3.6.1.2.1.1.10.18.6.1.12 read-only	This object specifies the timing source for the transmit clock for this T1 interface. This object differs from the MIB definition in that it is “read-only” (not read/write) for DSU/CSUs.	Supports the following values: ■ **loopTiming(1)** – The recovered receive clock is being used as the transmit clock. ■ **localTiming(2)** – The DSU/CSU’s internal clock is used being as the transmit clock. ■ **ThroughTiming(3)** – The recovered receive clock from another interface (e.g., network or synchronous data port) is being used as the transmit clock.
dsx1Fdl *(dsx1ConfigEntry 13)* 1.3.6.1.2.1.1.10.18.6.1.13 read-write	This object specifies how Facility Data Link is being used.	More than one value may be active at a time. Supports the following values: ■ **dsx1other(1)** – SNMP data is being sent over FDL. ■ **dsx1Ansi-T1-403(2)** – ANSI PRMs are supported on the network interface as specified by ANSI T1.403. ■ **dsx1Att-54016(4)** – FDL supports the requirements specified by AT&T publication TR54016. ■ **dsx1Fdl-none(8)** – Indicates that the device does not use FDL.

DS1 Near End Group Current Table Objects

The DS1 Near End Group Current Table contains various statistics being collected for the current 15-minute interval. The following objects are provided for the network interface only. Objects in the DS1 Current Table that are not listed below are not supported and will return an error status if access is attempted.

Table C-8. DS1 Near End Group Current Table Objects

Object, OID, Access	Description	Setting/Contents
dsx1CurrentIndex *(dsx1CurrentEntry 1)* 1.3.6.1.2.1.1.10.18.7.1.1 read-only	The index that identifies the network interface.	Supports the following values: ■ 1 to 7FFFFFFF.
dsx1CurrentESs *(dsx1CurrentEntry 2)* 1.3.6.1.2.1.1.10.18.7.1.2 read-only	Errored Seconds for the current interval.	An integer number.
dsx1CurrentSESs *(dsx1CurrentEntry 3)* 1.3.6.1.2.1.1.10.18.7.1.3 read-only	Severely Errored Seconds for the current interval.	
dsx1CurrentUASs *(dsx1CurrentEntry 5)* 1.3.6.1.2.1.1.10.18.7.1.5 read-only	Unavailable Seconds for the current interval.	
dsx1CurrentCCSs *(dsx1CurrentEntry 6)* 1.3.6.1.2.1.1.10.18.7.1.6 read-only	Controlled Slip Seconds for the current interval.	
dsx1CurrentBESs *(dsx1CurrentEntry 9)* 1.3.6.1.2.1.1.10.18.7.1.9 read-only	Bursty Errored Seconds for the current interval.	

DS1 Near End Group Interval Table Objects

The DS1 Near End Group Interval Total Table contains the cumulative sum of the various statistics for the 24-hour period preceding the current interval. The following objects are provided for the network interface only. Objects in the DS1 Interval Table that are not listed below are not supported and will return an error status if access is attempted.

Table C-9. DS1 Near End Group Interval Table Objects

Object, OID, Access	Description	Setting/Contents
dsx1IntervalIndex *(dsx1IntervalEntry 1)* 1.3.6.1.2.1.1.10.18.8.1.1 read-only	The index that identifies the network interface.	Supports the following values: ■ 1 to 7FFFFFFF.
dsx1IntervalNumber *(dsx1IntervalEntry 2)* 1.3.6.1.2.1.1.10.18.8.1.2 read-only	Interval number.	A number between 1 and 96, where 1 is the most recently completed 15-minute interval and 96 is the least recently completed 15-minute interval (assuming that all 96 intervals are valid).
dsx1IntervalESs *(dsx1IntervalEntry 3)* 1.3.6.1.2.1.1.10.18.8.1.3 read-only	Errored Seconds for the interval.	An integer number.
dsx1IntervalSESs *(dsx1IntervalEntry 4)* 1.3.6.1.2.1.1.10.18.8.1.4 read-only	Severely Errored Seconds for the interval.	
dsx1IntervalUASs *(dsx1IntervalEntry 6)* 1.3.6.1.2.1.1.10.18.8.1.6 read-only	Unavailable Seconds for the interval.	
dsx1IntervalCCSs *(dsx1IntervalEntry 7)* 1.3.6.1.2.1.1.10.18.8.1.6 read-only	Controlled Slip Seconds for the interval.	
dsx1IntervalBESs *(dsx1IntervalEntry10)* 1.3.6.1.2.1.1.10.18.8.1.10 read-only	Bursty Errored Seconds for the interval.	

DS1 Near End Group Total Table Objects

The DS1 Near End Group Total Table contains various statistics being collected for the current 15-minute interval. The following objects are provided for the network interface only. Objects in the DS1 Total Table that are not listed below are not supported and will return an error status if access is attempted.

Table C-10. DS1 Near End Group Total Table Objects

Object, OID, Access	Description	Setting/Contents
dsx1TotalIndex *(dsx1TotalEntry 1)* 1.3.6.1.2.1.1.10.18.9.1.1 read-only	The index that identifies the network interface.	Supports the following values: ■ 1 to 7FFFFFFF.
dsx1TotalESs *(dsx1TotalEntry 2)* 1.3.6.1.2.1.1.10.18.9.1.2 read-only	Errored Seconds for the previous 24-hour interval.	An integer number.
dsx1TotalSESs *(dsx1TotalEntry 3)* 1.3.6.1.2.1.1.10.18.9.1.3 read-only	Severely Errored Seconds for the previous 24-hour interval.	
dsx1TotalUASs *(dsx1TotalEntry 5)* 1.3.6.1.2.1.1.10.18.9.1.5 read-only	Unavailable Seconds for the previous 24-hour interval.	
dsx1TotalCCSs *(dsx1TotalEntry 6)* 1.3.6.1.2.1.1.10.18.9.1.6 read-only	Controlled Slip Seconds for the previous 24-hour interval.	
dsx1TotalBESs *(dsx1TotalEntry 9)* 1.3.6.1.2.1.1.10.18.9.1.9 read-only	Bursty Errored Seconds for the previous 24-hour interval.	

DS1 Fractional Group

The DS1 Fractional Group consists of the DS1 fractional table. This table (dsx1FracTable) is fully supported by the DSU/CSU and allows DS0 (time slots) to be mapped between the network interface and the data port. The DSU/CSU validates all channel configurations before applying them.

Ethernet-Like MIB – RFC 1643

The unit supports the Ethernet-Like MIB, RFC 1643 for all objects *except*:

- dot3Tests
- dot3ChipSets
- dot3Errors

RS-232-Like MIB – RFC 1659

The unit supports RS-232-Like MIB, RFC 1659:

- Number of RS-232-Like Ports Object.
- General Port Table Objects, Table C-11.
- Asynchronous Port Table Objects, Table C-12. Not supported for the User Data port.
- Synchronous Port Table Objects, Table C-13. Not supported for the Terminal port.
- Input Signal Table Objects, Table C-14. Not supported for the Terminal port.
- Output Signal Table Objects, Table C-15. Not supported for the Terminal port.

Supported for the User Data port and the Terminal port. RFC 1659 is an SNMPv2 MIB, but is converted to an SNMPv1 MIB to support this unit. This MIB consists of one object and five tables.

Number of RS-232-Like Ports Object

Supported as documented in the RFC.

General Port Table Objects

The General Port Table Objects contains configuration options for the RS-232-Like interfaces. Clarification for objects contained in this table as it applies to the unit is provided below.

Table C-11. General Port Table Objects

Object, OID, Access	Description	Setting/Contents
rs232PortType *(rs232PortEntry 2)* 1.3.6.1.2.1.10.33.2.1.2 read-only	Identifies the port hardware type.	Supports only the following values: **rs232(2)** – Identifies the Terminal port. **v35(5)** – Identifies the synchronous User Data port which is compatible with the V.35 standard.
rs232PortInSigNumber *(rs232PortEntry 3)* 1.3.6.1.2.1.10.33.2.1.3 read-only	Contains the number of input signals (in the input signal table) that can be detected.	The value is **2** for synchronous user data port and **0** for the Terminal port.
rs232PortOutSigNumber *(rs232PortEntry 4)* 1.3.6.1.2.1.10.33.2.1.4 read-only	Contains the number of output signals (in the output signal table) that can be asserted.	The value is **3** for synchronous User Data port and **0** for the Terminal port.
rs232PortOutSpeed *(rs232PortEntry 6)* 1.3.6.1.2.1.10.33.2.1.6 read-write	Contains the port's output speed in bits per second. The rs232PortOutSpeed object has the same values as the rs232PortInSpeed object.	Supports the following speeds for the Terminal port: 2400, 4800, 9600,14,400, 19,200, 28,800, 38,400.

The following are not supported:

- rs232PortInFlowType *(rs232PortEntry 7)*
- rs232PortOutFlowType *(rs232PortEntry 8)*

Asynchronous Port Table Objects

The Asynchronous Port Table Objects contains an entry for the Terminal port. For this unit, entries in the table that are counters (rs232AsyncPortEntry 6–8) are used to collect statistics only and are not supported.

Table C-12. Asynchronous Port Table Objects

Object, OID, Access	Description	Setting/Contents
rs232AsyncPortBits *(rs232AsyncPortEntry 2)* 1.3.6.1.2.1.10.33.3.1.2 read-write	Specifies the number of bits in a character.	Supports only the following values: **7** – 7-bit characters **8** – 8-bit characters
rs232AsyncPortStopBits *(rs232AsyncPortEntry 3)* 1.3.6.1.2.1.10.33.3.1.3 read-write	Specifies the number of stop bits supported.	Supports only the following values: **one(1)** – One stop bit **two(2)** – Two stop bits
rs232AsyncPortParity *(rs232AsyncPortEntry 4)* 1.3.6.1.2.1.10.33.3.1.4 read-write	Specifies the type of parity used by the port.	Supports only the following values: **none(1)** – No parity bit **odd(2)** – Odd parity **even(3)** – Even parity
rs232AsyncPortAuto-Baud *(rs232AsyncPortEntry 5)* 1.3.6.1.2.1.10.33.3.1.5 read-write	Specifies the ability to automatically sense the input speed of the port.	Supports only the following values: **disabled(2)** – Does not support Autobaud.

Synchronous Port Table Objects

The Synchronous Port Table Objects contains an entry for the synchronous user data port when this port is configured for synchronous operation. For this unit, entries in the table that are counters (rs232SyncPortEntry 3–7) are used to collect statistics only and are not supported. Clarification for objects contained in this table as it applies to the unit is provided below.

Table C-13. Synchronous Port Table Objects (1 of 2)

Object, OID, Access	Description	Setting/Contents
rs232SyncPortClock-Source *(rs232SyncPortEntry 2)* 1.3.6.1.2.1.10.33.4.1.2 read-write	Specifies the clock source for the port.	Supports only the following values: **internal(1)** – The port uses an internal clock. **external(2)** – The port uses an external clock.
rs232SyncPortRole *(rs232SyncPortEntry 8)* 1.3.6.1.2.1.10.33.4.1.8 read-write	Specifies whether this device interface is a DTE or DCE.	Supports only the following value: **dce(2)** – The port acts as a DCE.
rs232SyncPortEncoding *(rs232SyncPortEntry 9)* 1.3.6.1.2.1.10.33.4.1.9 read-write	Specifies the bit encoding technique that this port uses.	Supports only the following value: **nrz(1)** – The port uses non-return to zero encoding. **nrzi(2)** – The port uses non-return to zero-inverted encoding. This corresponds to the inverted transmit and receive data relationship.
rs232SyncPortRTS-Control *(rs232SyncPortEntry 10)* 1.3.6.1.2.1.10.33.4.1.10 read-write	Specifies the method used to control the RTS signal.	Supports only the following values: **controlled(1)** – For User Data port, this value is used when the Data Port option Carrier Control by RTS is set to Switched. **constant(2)** – For User Data port, this value is used when the Data Port option Carrier Control by RTS is set to Constant.

Table C-13. Synchronous Port Table Objects (2 of 2)

Object, OID, Access	Description	Setting/Contents
rs232SyncPortMode *(rs232SyncPortEntry 12)* 1.3.6.1.2.1.10.33.4.1.12 read-write	Specifies the port's mode of data transfer.	Supports only the following value: **fdx(1)** – Full-duplex
rs232SyncPortMinFlags *(rs232SyncPortEntry 14)* 1.3.6.1.2.1.10.33.4.1.14 read-write	Specifies the minimum number of flag patterns the port needs in order to recognize the end of one from and the start of another.	The only valid value is **2**.

The following is not supported:

- rs232SyncPortIdle Pattern *(rs232SyncPortEntry 13)*

Input Signal Table Objects

The Input Signal Table Objects contains entries for the input signals that can be detected by the unit for the synchronous user data port. Clarification for objects contained in this table as it applies to the unit is provided below.

Table C-14. Input Signal Table Objects

Object, OID, Access	Description	Setting/Contents
rs232InSigName *(rs232InSigEntry 2)* 1.3.6.1.2.1.10.33.5.1.2 read-only	Contains the identification of a hardware input signal.	Supports only the following values: **rts(1)** – Request To Send **dtr(4)** – Data Terminal Ready
rs232InSigState *(rs232InSigEntry 3)* 1.3.6.1.2.1.10.33.5.1.3 read-only	Contains the current signal state.	Supports only the following values: **on(2)** – The signal is asserted. **off(3)** – The signal is deasserted.
rs232InSigChanges *(rs232InSigEntry 4)* 1.3.6.1.2.1.10.33.5.1.4 read-only	Indicates the number of times that a signal has changed from on to off, or off to on.	The object is incremented each time that the signal is sampled (every 100 ms) and the signal state is different from the previous state.

Output Signal Table Objects

The Output Signal Table Objects contains entries for the output signals that can be asserted by the unit, for the synchronous User Data port. Clarification for objects contained in this table as it applies to the unit is provided below.

Table C-15. Output Signal Table Objects

Object, OID, Access	Description	Setting/Contents
rs232OutSigName *(rs232OutSigEntry 2)* 1.3.6.1.2.1.10.33.6.1.2 read-only	Contains the identification of a hardware output signal.	Supports only the following values: **cts(2)** – Clear To Sen DS1**r(3)** – Data Set Ready
rs232OutSigState *(rs232OutSigEntry 3)* 1.3.6.1.2.1.10.33.6.1.3 read-only	Contains the current signal state.	Supports only the following values: **on(2)** – The signal is asserted. **off(3)** – The signal is deasserted.
rs232OutSigChanges *(rs232OutSigEntry 4)* 1.3.6.1.2.1.10.33.6.1.4 read-only	Indicates the number of times that a signal has changed from on to off, or off to on.	Increments the object each time that the signal is sampled (every 100 ms) and the signal state is different from the previous state.

Generic Interface Extension MIB – RFC 1229

The unit supports the Generic Interface Extension MIB (RFC 1229):

- Table C-16, Generic Interface Test Table Objects

The DSU/CSU only supports the Generic Interface Test Table in the Generic Interface Extension MIB.

Generic Interface Test Table Objects

The Generic Interface Test Table Objects are used to access additional tests (loopbacks and pattern tests) that are not provided in the interface group of MIB II. Clarification for objects contained in this table as it applies to the unit is provided below.

Table C-16. Generic Interface Test Table Objects (1 of 3)

Object	Description	Setting/Contents
ifExtnsTestType *(ifExtnsTestEntry 4)* 1.3.6.1.3.6.2.1.4 read-write	A control variable used to start and stop user-initiated tests on the interface. The following tests may be controlled: ■ Monitor QRSS test pattern on the network T1 interface. ■ Send QRSS/511 test pattern on the User Data port. ■ Send V.54/FT1 up/down code to the remote unit for the User Data port. ■ Monitor QRSS/511 test pattern on the User Data port. ■ Data Channel and Data Terminal Loopbacks on the User Data port.	The following objects use identifiers to control tests on the network T1 and User Data port interface: ■ **notest(0 0)** – Stops the test in progress on the network T1 or User Data port interface. ■ **testMon QRSS (wellKnownTests 3)** – Starts a Monitor QRSS test on the interface. *Continued on next page.*

Table C-16. Generic Interface Test Table Objects (2 of 3)

Object	Description	Setting/Contents
ifExtnsTestType (cont'd)		The following objects use identifiers to control tests only on the User Data port interface: ■ **testFullDuplexLoopBack (wellKnownTests 1)** – Starts a Data Channel Loopback (DCLB) on the interface. ■ **testLoopDTLB (wellKnownTests 2)** – Starts a Data Terminal Loopback (DTLB) on the interface. ■ **testMon 511 (wellKnownTests 4)** – Starts a Monitor 511 test on the interface. ■ **testSendQRSS (wellKnownTests 5)** – Starts a Send QRSS test on the interface. ■ **testSend511 (wellKnownTests 6)** – Starts a Send 511 test on the interface. ■ **testSendV54Up (wellKnownTests 7)** – Sends a V.54 up code to the remote unit. ■ **testSendV54Down (wellKnownTests 8)** – Sends a V.54 down code to the remote unit. ■ t**estSendFT1Up (wellKnownTests 9)** – Sends a FTI up code to the remote unit. ■ **testSendFT1Down (wellKnownTests 10)** – Sends a FT1 down code to the remote unit.

Table C-16. Generic Interface Test Table Objects (3 of 3)

Object	Description	Setting/Contents
ifExtnsTestResult *(ifExtnsTestEntry 5)* 1.3.6.1.3.6.2.1.5 read-only	Contains the result of the most recently requested test.	Supports the following values: ■ **none(1)** – No test active. ■ **inProgress(3)** – Test is in progress. ■ **notSupported(4)** – Requested test is not supported. ■ **unAbleToRun(5)** – Test cannot run due to the state of the unit.
ifExtnsTestCode *(ifExtnsTestEntry 6)* 1.3.6.1.3.6.2.1.6 read-only	Contains a code providing more specific information about the test result.	Supports the following values: ■ **none (wellKnownCodes 1)** – No further information is available. Used for send pattern/code and loopback tests. ■ **inSyncNoBitErrors (wellKnownCodes 2)** – A monitor pattern (QRSS or 511) test has synchronized on the pattern and has not detected any bit errors. ■ **inSyncWithBitErrors (wellKnownCodes 3)** – A monitor pattern (QRSS or 511) test has synchronized on the pattern but has detected any bit errors. ■ **notInSync (wellKnownCodes 4)** – A monitor pattern (QRSS or 511) test has not synchronized on the requested pattern.

Enterprise MIB Object

The following Paradyne Enterprise MIB Object is supported by the unit:

- Device Configuration Variable, Table C-17

Device Configuration Variable (pdn-common 7)

The variable devConfigAreaCopy in the devConfigArea group is supported. This variable allows the entire contents of one configuration area to be copied into another configuration area. The unit only supports the following values.

Table C-17. Device Configuration Variable

Object, OID, Access	Description	Setting/Contents
devConfigAreaCopy 1.3.6.1.4.1.1795.2.24.2.7.1.1 read-write	A "get" of this object will always return noOp.	**noOp(1)**
	Copy from active area to customer 1 area.	**active-to-customer1(2)**
	Copy from active area to customer 2 area.	**active-to-customer2(3)**
	Copy from customer 1 area to active area.	**customer1-to-active(4)**
	Copy from customer 1 area to customer 2 area.	**customer1-to-customer2(5)**
	Copy from customer 2 area to active area.	**customer2-to-active(6)**
	Copy from customer 2 area to customer 1 area.	**customer2-to-customer1(7)**
	Copy from factory area to active area. There is only one factory area for the unit.	**factory1-to-active(8)**
	Copy from factory area to customer 1 area.	**factory1-to-customer1(9)**
	Copy from factory area to customer 2 area.	**factory1-to-customer2(10)**

Device Security, pdn-security (pdn-common 8)

Use the Device Security table to control the number of SNMP managers that may access the unit, as well as the unit access level (read or read/write). Fully supported by the unit.

Device Traps, pdn-traps (pdn-common 9)

Controls the SNMP managers to which the unit reports traps. Fully supported by the unit.

Device Control, pdn-control (pdn-common 10)

Uses the devControlReset object to reset the unit. Fully supported by the unit.

Standards Compliance for SNMP Traps

D

Overview

This section describes the unit's compliance with SNMP standards and any special operational features for the SNMP traps supported. The unit supports the following user interface traps and enterprise-specific traps:

Trap: warmStart

SNMP Trap	Description	Possible Cause
warmStart	The unit has reinitialized itself. The trap is sent after the unit resets and stabilizes. There are no variable-bindings.	■ Reset command. ■ Power disruption.

Trap: authentificationFailure

Along with the authenticationFailure MIB, a string is returned that identifies the IP address of the workstation that attempted to access the unit.

NOTE:

To display the address of the workstation that attempted to access the unit, you must customize your SNMP trap by adding **$1** after authentication failure.

SNMP Trap	Description	Possible Cause
authenticationFailure	Failed attempts to access the unit. There are no variable-bindings.	■ SNMP message not properly authenticated. ■ Three unsuccessful attempts were made to enter a correct login/password combination. ■ IP address security is enabled, and a message was received from SNMP manager whose address was not on the list of approved managers. ■ Attempt to set a read-only MIB object.

Traps: linkUp and linkDown

The link SNMP traps are:

- **linkUp** – The unit recognizes that one of the failed communication interfaces is operational (up).
- **linkDown** – The unit recognizes a failure in one of the communication interfaces.

The following table describes the conditions that define linkUp and linkDown for each interface:

Interface	linkUp/Down Variable-Bindings	Possible Cause
Physical Sublayer – Represented by the entry in the MIB II Interfaces Table.		
T1 network (Supported by the media-specific ds1 MIB.)	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ dsx1LineStatus (RFC 1406)	■ **linkDown** – One or more alarm conditions are active on the interface. Alarm conditions include: – Loss of Signal – Out of Frame – Alarm Indication Signal – Excessive Error Rate – Yellow Alarm ■ **linkUp** – No alarms on the interface.
Synchronous User Data Port (Supported by the media-specific RS232-Like MIB.)	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573)	■ **linkDown** – One or more alarm conditions are active on the interface. Alarm conditions include: – DTR Off (only if the DTE supports the DTR lead and the port is configured to monitor DTR. – RTS Off (only if the DTE supports the RTS lead). ■ **linkUp** – No alarms on the interface.

Traps: enterpriseSpecific

The enterpriseSpecific trap indicates that an enterprise-specific event has occurred. The Specific-trap field in the Trap PDU identifies the particular trap that occurred. The following table lists the enterprise specific traps supported by the unit:

Trap	What It Indicates	Possible Cause
enterprisePrimaryClockFail (1)	The currently configured primary clock source has failed.	The T1 network is down.
enterpriseSelfTestFail(2)	A hardware failure of the unit is detected during the unit's self-test. The trap is generated after the unit completes initialization.	Failure of one or more of the unit's hardware components.
enterpriseDeviceFail(3)	An internal device failure.	Operating software has detected an internal device failure.
enterpriseTestStart(5)	A test is running.	At least one test has been started on an interface.
enterpriseConfigChange(6)	The configuration changed via the user interface or an SNMP manager. The trap is sent after 60 seconds have elapsed without another change. This suppresses the sending of numerous traps when multiple changes are made in a short period of time, as is typically the case when changing configuration options.	Configuration has been changed via the user interface or an SNMP manager.
enterpriseTestStop(105)	All tests have been halted.	All tests have been halted on an interface.

There are no variable-bindings for enterprisePrimaryClockFail, enterpriseDeviceFail, and enterpriseConfigChange. The variable-binding for enterpriseSelfTestFail is devSelfTestResults.

The tests that affect the enterpriseTestStart, enterpriseTestStop, and the variable-binding are different for each particular interface. Diagnostic tests are only supported on the physical T1 network and user data port interfaces. The specific tests and variable-bindings are described in the following table:

Interface	**enterpriseTestStart/Stop Variable-Bindings**	**Possible Cause**
Physical Sublayer		
T1 network	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ dsx1SendCode (RFC1406)	■ enterpriseTest Start – Any one of the following tests is active on the interface: – Remote Line Loopback – Send QRSS pattern ■ enterpriseTest Stop – No longer has any tests running on the interface.
	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ dsx1LoopbackConfig (RFC 1406)	■ enterpriseTest Start – Any one of the following tests is active on the interface: – Line Loopback – Payload Loopback ■ enterpriseTest Stop – No longer has any tests running on the interface.
	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ ifTestType (RFC 1573)	■ enterpriseTest Start – Any one of the following tests is active on the interface: – Repeater Line Loopback – Send 1-in-8 pattern – All Monitor Pattern tests ■ enterpriseTest Stop – No longer has any tests running on the interface.
Synchronous User Data Ports	■ ifIndex (RFC 1573) ■ ifAdminStatus (RFC 1573) ■ ifOperStatus (RFC 1573) ■ ifType (RFC 1573) ■ ifTestType (RFC 1573)	■ enterpriseTest Start – Any one of the following tests is active on the port: – Local Loopback (DTE) – Send 511 pattern – Monitor 511 pattern ■ enterpriseTest Stop – No longer has any tests running on the port.

Cables and Pin Assignments

E

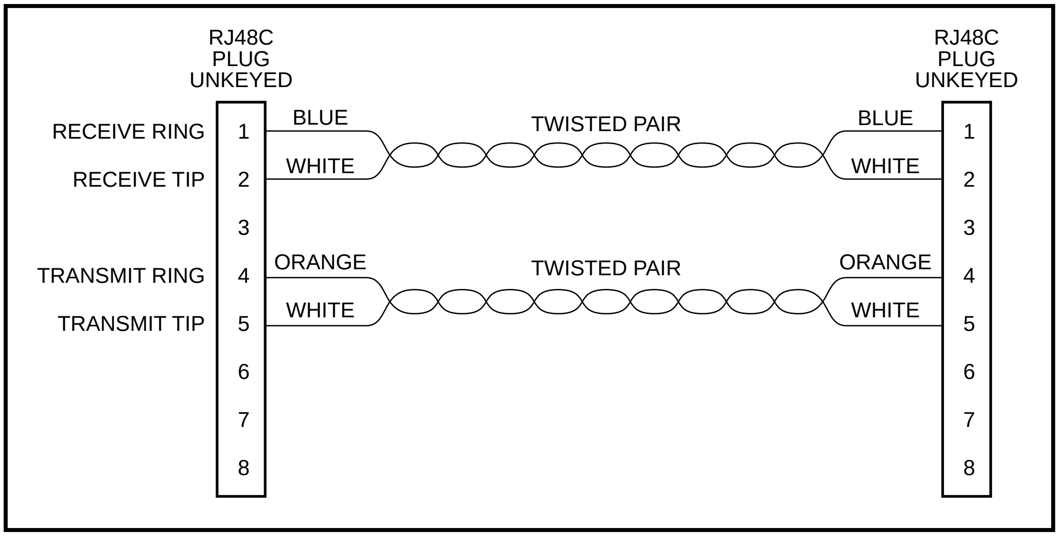
Cabling Overview

The following sections provide pin assignments:

- Modular RJ48C-to-RJ48C T1 Network Interface Cable
- Modular RJ48C-to-CA81A T1 Network Interface Cable
- Terminal Port EIA-232 Connector
- 10BaseT Connector
- Serial Crossover Cable
- DTE V.35 Connector

Modular RJ48C-to-RJ48C T1 Network Interface Cable

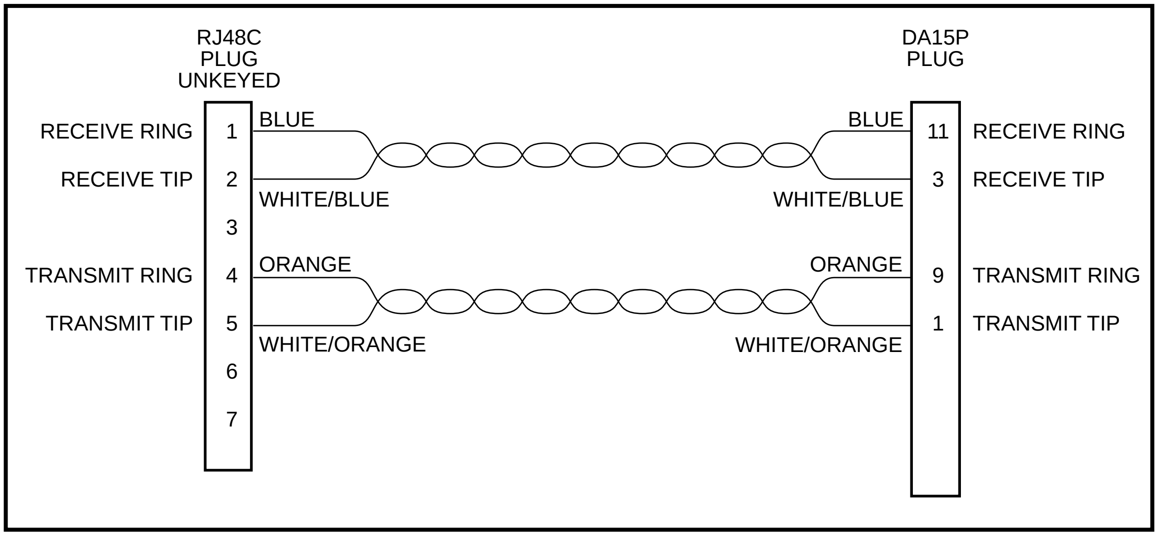
Network access in the United States is via a 20-foot modular cable with an RJ48C plug connector on each end.



493-14156-01

Modular RJ48C-to-CA81A T1 Network Interface Cable

Network access in Canada is via a 20-foot modular cable with a CA81A plug connector on one end and an RJ48C plug connector on the other end.



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Terminal Port EIA-232 Connector

The Terminal port connects to a PC or VT100-compatible terminal.

Signal	Direction	Pin #
Transmit Data (TXD)	To DSU/CSU (In)	2
Received Data (RXD)	From DSU/CSU (Out)	3
Request to Send (RTS)	To DSU/CSU (In)	4
Clear to Send (CTS)	From DSU/CSU (Out)	5
Data Set Ready (DSR)	From DSU/CSU (Out)	6
Signal Ground (SG)	—	7
Carrier Detect (CD)	From DSU/CSU (Out)	8
Data Terminal Ready (DTR)	To DSU/CSU (In)	20

10BaseT Connector

Use a standard 10BaseT cable to connect the DSU to an Ethernet LAN. A cable is provided with the DSU.

The following table defines the pinouts for the 10BaseT port. It is an 8-pin, unkeyed jack.

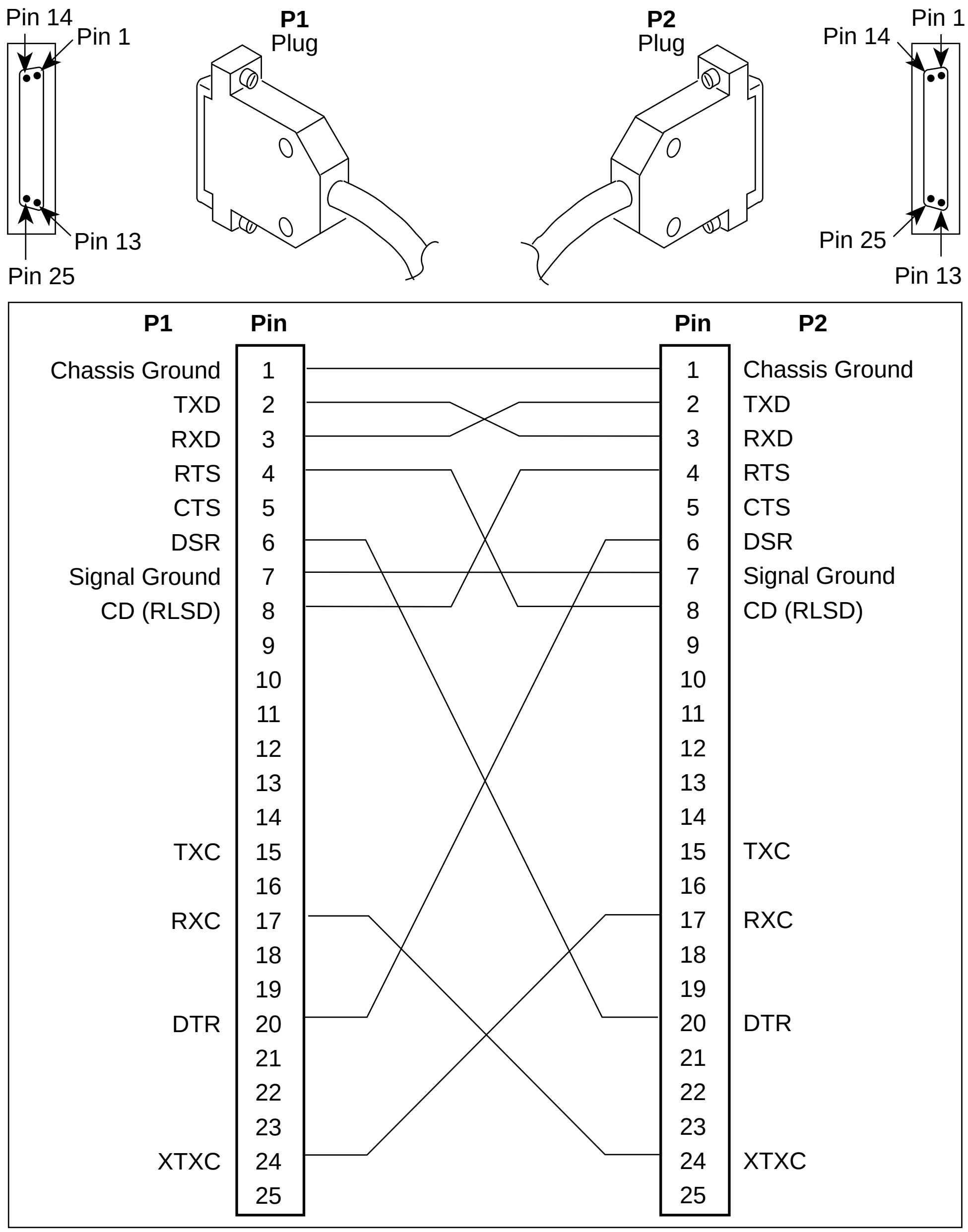
Use	Pin #
Transmitted Data +	1
Transmitted Data –	2
Received Data +	3
NC	4
NC	5
Received Data –	6
NC	7
NC	8
NC = Not connected (unused).	

Serial Crossover Cable

Use a serial crossover cable to connect an external modem to the DSU/CSU's COM port.

NOTE:

The Pin 17 to Pin 24 crossovers are not required and have no effect with the Model 7112.



P1	Pin	Pin	P2
Chassis Ground	1	1	Chassis Ground
TXD	2	2	TXD
RXD	3	3	RXD
RTS	4	4	RTS
CTS	5	5	CTS
DSR	6	6	DSR
Signal Ground	7	7	Signal Ground
CD (RLSD)	8	8	CD (RLSD)
	9	9	
	10	10	
	11	11	
	12	12	
	13	13	
	14	14	
TXC	15	15	TXC
	16	16	
RXC	17	17	RXC
	18	18	
	19	19	
DTR	20	20	DTR
	21	21	
	22	22	
	23	23	
XTXC	24	24	XTXC
	25	25	

98-15811

DTE V.35 Connector

The following table provides the pin assignments for the 34-position V.35 connector to the DTE.

Signal	ITU CT#	Direction	34-Pin Socket Connector
Signal Ground/Common	102	—	B
Request to Send (RTS)	105	To DSU/CSU (In)	C
Clear to Send (CTS)	106	From DSU/CSU (Out)	D
Data Set Ready (DSR)	107	From DSU/CSU (Out)	E
Received Line Signal Detector (RLSD or LSD)	109	From DSU/CSU (Out)	F
Data Terminal Ready (DTR)	108/1, /2	To DSU/CSU (In)	H
Remote Loopback (RL)	140	To DSU/CSU (In)	N
Local Loopback (LL)	141	To DSU/CSU (In)	L
Transmitted Data (TXD)	103	To DSU/CSU (In)	P (A) S (B)
Received Data (RXD)	104	From DSU/CSU (Out)	R (A) T (B)
Transmitter Signal Element Timing — DTE Source (XTXC or TT)	113	To DSU/CSU (In)	U (A) W (B)
Receiver Signal Element Timing — DCE Source (RXC)	115	From DSU/CSU (Out)	V (A) X (B)
Transmitter Signal Element Timing — DCE Source (TXC)	114	From DSU/CSU (Out)	Y (A) AA (B)
Test Mode Indicator (TM)	142	From DSU/CSU (Out)	NN

Technical Specifications

F

Model 7112 DSU/CSU Technical Specifications (1 of 2)

Item	Specifications
Approvals	Refer to the product labeling
Clock Sources	T1 network interface, Port, or internal clock
Environment	
Operating Temperature	32°F to 122°F (0°C to 50°C)
Storage Temperature	–4°F to 158°F (–20°C to 70°C)
Relative Humidity Shock and Vibration	5%—95% (noncondensing) Withstands normal shipping and handling
Loopbacks	
Standard	AT&T TR 54016, AT&T TR 62411, ANSI T1.4031989
Additional	LLB (Line Loopback), PLB (Payload Loopback), RLB (Repeater Loopback), DTLB (Data Terminal Loopback), DCLB (Data Channel Loopback) V.54 Loop 2 and Loop 3, ANSI T1.403 Annex B Fractional T1 Loopback

Model 7112 DSU/CSU Technical Specifications (2 of 2)

Item	Specifications
MIB II Object Groups Supported	■ ICMP group ■ Interfaces group: – T1 network – DTE Data port – Terminal port – Ethernet port ■ IP group ■ SNMP group ■ System group ■ TCP group ■ Transmission group: – T1 network – DS1/E1 MIB – DTE Data port – RS-232-Like MIB – Terminal port – RS-232-Like MIB – Ethernet port – Ethernet-Like MIB ■ UDP group
Network T1 Interface	
Physical Interface (USA)	RJ48C
Physical Interface (Canada)	CA81A using adapter cable (optional, Feature 3100–F1–501)
Framing Format	D4, ESF
Coding Format	AMI, B8ZS
Line Build-Out (LBO)	0.0 dB, –7.5 dB, –15 dB, –22.5 dB
ANSI PRM	Selectable
Bit Stuffing	FCC Part 68, AT&T TR 62411
NMS Compatibility	SNMP Network Manager
Physical Dimensions	
Height (including feet)	2.1 inches (5.3 cm)
Height (without feet)	2.0 inches (5.1 cm)
Width	8.7 inches (22.1 cm)
Depth (case)	6.2 inches (15.7 cm)
Depth (case and connectors)	6.5 inches (16.5 cm)
Weight	1 lb, 6 oz. (625 g)
Port Interface	
Standards	V.35
Rates	Nx64 – 64K-1.536 Mb Nx56 – 56K-1.344 Mb
Power Consumption and Dissipation	4.5 watts, 15.4 Btu per hour at 120 volts (ac power)
Power Requirements	
AC Power Module	Refer to the labeling on the ac power module for input requirements

Glossary

ACAMI allocation method Alternate Channel Alternate Mark Inversion. A method of allocating DS0 channels as a group, so that every alternate DS0 channel does not carry data, but instead transmits and receives all ones.

agent A software program housed within a device to provide SNMP functionality. Each SNMP agent stores management information and responds to the manager's request.

aggregate A single bit stream that combines two or more bit streams.

AIS Alarm Indication Signal. A signal transmitted instead of the normal signal to maintain transmission continuity and to indicate to the receiving device that a transmission fault exists.

AMI Alternate Mark Inversion. A line coding technique used to accommodate the ones density requirements of T1 lines.

ASCII American Standard Code for Information Interchange. A 7-bit code that establishes compatibility between data services. ASCII is the standard for data transmission over telephone lines.

ASCII Terminal or Printer Devices that can be attached, either locally or remotely, to display or print the DSU's alarm messages.

asynchronous A data transmission that is synchronized by a transmission start bit at the beginning of a character (five to eight bits) and one or more stop bits at the end.

AT Command Set Attention Command Set. A group of commands, issued from an asynchronous DTE, that allows control of the modem while in Command mode. All commands must begin with the characters AT and end with a carriage return.

ATI Asynchronous terminal interface. This feature allows a device to be controlled from an async (asynchronous) terminal like an ASCII (VT100-compatible) terminal.

autobaud mode An operational mode in which the DSU forces automatic setting of the DDS line rate/speed (56 or 64 kbps) as soon as a valid DDS network signal is detected.

AUX port The auxiliary communications port on a router.

BES Bursty Errored Seconds. Seconds with more than one, but less that 320 CRC6 errors.

block allocation method A method of allocating DS0 channels as a group rather than individually.

BPV Bipolar Violation. A modified bipolar signaling method in which a control code is inserted.

B8ZS Bipolar with Eight Zero Substitution. A line coding technique used to accommodate the ones density requirement of T1 lines.

CCA Circuit Card Assembly. A printed circuit board to which separate components are attached.

CCITT Consultative Committee on International Telegraphy and Telephony. See ITU.

CD Carrier Detect. A signal indicating that energy exists on the transmission circuit. Associated with Pin 8 on an EIA-232 interface.

channel An independent data path.

channel allocation Assigning specific DS0 channels in the DSU/CSU to specific interfaces (network, DTE Drop/Insert, etc.).

community name An identification used by SNMP to grant an SNMP server access rights to a MIB.

configuration option Device software that sets specific operating parameters for the DSU.

CPE Customer Premises Equipment. Terminating equipment supplied by either the customer or some other supplier that is connected to the telecommunications network (e.g., DSUs, terminals, phones, routers, modems).

CRC Cyclic Redundancy Check. A mathematical method of confirming the integrity of received digital data.

CSA Canadian Standards Association.

CSU Channel Service Unit. The function of the DSU that protects the T1 line from damage and regenerates the T1 signal.

CTS Clear to Send. An EIA-lead standard for V.24 circuit CT 106; an output signal (DCE-to-DTE).

data port The electrical interface between the DSU/CSU and the synchronous data terminal equipment.

DCE Data Communications Equipment. The equipment that provides the functions required to establish, maintain, and end a connection. It also provides the signal conversion required for communication between the DTE and the network.

DCLB Data Channel Loopback. Loops the data received from the network interface, for all DS0 channels allocated to the selected port, back to the network.

default A preset value that is assumed to be correct unless changed by the user.

digital signal A signal composed of discrete elements (zeros and ones) instead of a great multitude of analog elements.

DS1/E1 MIB Defines objects for managing the network and DTE Drop/Insert interfaces on the DSU/CSU.

DSR Data Set Ready. An EIA-lead standard for V.24 circuit CT 107; an output signal (DCE-to-DTE).

DSU Data Service Unit. Data communications equipment that provides an interface between the DTE and the digital network.

DS0 Digital Signal Level 0.

DS0 channel allocation Assigning specific DS0 channels in the DSU/CSU to specific interfaces (network, DTE Drop/Insert, etc.).

DTE Data Terminal Equipment. The equipment, such as computers and printers, that provides or creates data.

DTLB Data Terminal Loopback. Loops the data received from the selected port, for all DS0 channels allocated to the port, back out the port.

DTR Data Terminal Ready. An EIA-lead standard for V.24 circuit CT 108; an input signal (DTE-to-DCE).

D4 The transmission standard that specifies 12 frames as a superframe that is used for frame synchronization and to locate signaling bits.

EER Excessive Error Rate. An error rate that is greater than the threshold in the DSU/CSU.

EIA Electronic Industries Association. This organization provides standards for the data communications industry to ensure uniformity of interface between DTEs and DCEs.

EIA-232 The EIA's standards defining the 25-pin interface between the DTE and DCE.

Enterprise MIB MIB objects unique to Paradyne devices.

enterprise-specific trap A trap unique to Paradyne devices.

ES Errored seconds. Seconds with one or more ESF error events.

ESF Extended Superframe. The T1 transmission standard that specifies 24 frames as an extended superframe to be used for frame synchronization and to locate signaling bits.

excessive BPV An excessive bipolar violation condition results when at least one invalid bipolar violation has occurred every 20 milliseconds for 2 seconds.

factory defaults A predetermined set of configuration options for general operation.

FCC Federal Communications Commission. Board of Commissioners that regulates all U.S. interstate, intrastate, and foreign electrical communication systems that originate from the United States.

FDL Facility Data Link. Selected bits in the ESF format that are used for control, monitoring, and testing.

FT1 Fractional T1. Individual DS0 channels that may be sold separately or in groups to provide bandwidth that is some fraction of the total T1 capability.

full-duplex The capability to transmit in two directions simultaneously.

HDLC High-Level Data Link Control. A communications protocol defined by the International Standards Organization (ISO).

ICMP Internet Control Management Protocol. Internet protocol that allows for the generation of error messages, tests packets, and information messages related to IP.

interface A shared boundary between functional units.

IP Internet Protocol. The TCP/IP standard protocol that defines the unit of information passed across an Internet and provides the basis for packet delivery service. IP includes the ICMP control and error message protocol as an integral part. The entire protocol suite is often referred to as TCP/IP because TCP and IP are the two most fundamental protocols.

IP address The IP address has a host component and a network component. The address is assigned to hosts or workstations with direct Internet access to uniquely identify entities on the Internet.

ITU International Telecommunication Union, formerly known as CCITT. An advisory committee established by the United Nations to recommend communications standards and policies.

LAN Local Area Network. A network designed to connect devices over short distances, like within a building.

LED Light Emitting Diode. A status indicator that responds to the presence of a certain conditions.

link layer protocol The protocol that regulates the communication between two network nodes.

LL Local Loopback. An EIA-lead standard for V.24 circuit CT 141; an input signal (DTE-to-DCE).

LLB Line Loopback. Loops the received signal on the network interface back to the network without change.

LOF Loss of Frame. The inability to maintain frame synchronization.

LOFC Loss of Frame Count. A count of the number of LOFs declared.

loopback Used to test various portions of a data link in order to isolate an equipment or data line problem. A diagnostic procedure that sends a test message back to its origination point.

LOS Loss Of Signal. The T1 line condition where there are no pulses.

LSD Line Signal Detect. An EIA-lead standard for V.24 circuit CT 109; an output signal (DCE-to-DTE).

manager (SNMP) The device that queries agents for management information, or receives unsolicited SNMP trap messages indicating the occurrence of specific events.

MIB Management Information Base. The set of variables a device running SNMP maintains. Standard, minimal MIBs have been defined, and vendors often have private enterprise MIBs. In theory, any SNMP manager can talk to any SNMP agent with a properly defined MIB. MIB-II refers to an extended management database that contains variables not defined in the original MIB I.

multiplexing A method for interleaving several access channels onto a single circuit for transmission over the network.

network interface The T1 network interface connector on the rear panel of the DSU/CSU.

NMS Network Management System. A computer system used for monitoring and controlling network devices.

node A connection or switching point on the network.

NS No Signal. A network-reported condition.

object (SNMP) A specific item within the Management Information Base (MIB).

OOF Out Of Frame. An error condition in which frame synchronization bits are in error. A network-reported condition.

OOS Out of Service. A digital network trouble signal.

point-to-point circuit A data network circuit with one control and one tributary device.

PPP Point-to-Point Protocol. A link-layer protocol used by SNMP.

protocol The rules that govern how devices exchange information on a network. It covers timing, format, error control, and flow control during data transmission.

PSTN Public Switched Telephone Network. A network shared among many users who can use telephones to establish connections between two points.

QRSS Quasi-Random Signal Source. Test pattern that approximates live data that can be monitored for logic errors (on the network and the data port).

reset A reinitialization of the device that occurs at power-up or in response to a reset command.

RFC Request for Comments. The set of documents that describes the standard specifications for the TCP/IP protocol suite.

RIP Routing Information Protocol. Specifies the routing protocol used between DSUs.

RLSD Receive Line Signal Detect. See CD.

router A device that makes decisions about the paths network traffic should take and forwards that traffic to its destination. A router helps achieve interoperability and connectivity between different vendor’s equipment, regardless of protocols used.

RS-232 An EIA standard for the 25-pin DCE/DTE interface. Same as EIA-232.

RTS Request to Send. An EIA-lead standard for V.24 circuit CT 105; an input signal (DTE-to-DCE).

RXC Received Clock. An EIA-lead standard for V.24 circuit CT 115; an output signal (DCE-to-DTE).

RXD Received Data. An EIA-lead standard for V.24 circuit CT 104; an output signal (DCE-to-DTE).

SDLC Synchronous Data Link Control. A standard data link protocol.

self-test A test that checks most hardware components when power is applied to the device or a reset is initiated.

SES Severely Errored Seconds. For T1 data, seconds with 320 or more CRC6 errors or errored frame alignment signals.

SLIP Serial Line Internet Protocol. A link layer protocol being used over serial lines by IP.

SNMP Simple Network Management Protocol. A generic internet network management protocol that allows the device to be managed by any industry-standard SNMP manager.

subnet An IP addressing standard in which a portion of the host address can be used to create multiple network addresses that are logically a subdivision of the network address.

subnet address 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 a subnet address mask. This allows a site to use a single IP network address for multiple physical networks.

subnet mask An integer used with the IP address of the host to determine which bits in the host address are used in the subnet address.

synchronous Data transmission that is synchronized by timing signals. Characters are sent at a fixed rate.

TCP/IP Transmission Control Protocol/Internet Protocol. Refer to IP.

TDM Time Division Multiplexer. A device that enables the simultaneous transmission of multiple independent data streams into a single high-speed data stream.

Telnet 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 the user for that host.

time slot The allocated DS0 channel slot when DS0 channels are combined to form an aggregate bit stream.

TM Test Mode. An EIA-lead standard for V.24 circuit CT 142; an output signal (DCE-to-DTE).

trap (SNMP) A notification message to the SNMP manager when an unusual event occurs on a network device, such as a reinitialization.

TX Transmit. To send signals from a device.

TXC Transmit Clock. An EIA-lead standard for V.24 circuit CT 114; an output signal (DCE-to-DTE).

TXD Transmit Data. An EIA-lead standard for V.24 circuit CT 103; an input signal (DTE-to-DCE).

T1 A wideband digital interface operating at 1.544 Mbps.

UAS Unavailable Seconds. A count of 1-second intervals when service is unavailable.

UDP User Datagram Protocol. An Internet protocol.

V.24 A CCITT standard for a low-speed, 25-position, DCE/DTE interface.

V.35 ITU-T standard for a high-speed, 34-pin, DCE/DTE interface.

V.54 A CCITT standard for local and remote diagnostic loopback tests.

WAN Wide Area Network. A network that operates over long distances and spans a relatively large geographic area (e.g., a country).

Yellow Alarm An outgoing signal transmitted when a DS1 terminal has determined that it has lost the incoming signal.

1-in-8 pattern A test pattern consisting of a one (1) followed by seven zeros (on the network only).

511 pattern A pseudo-random bit sequence that is 511 bits long (on the data ports only).

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