7996-A2-374
SHDSL-G.703 NTU

User's Guide

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Chapter 1   Introduction

1.1   Overview

This user's manual provides general information about the features, functions and operation of the 7996-A2-374 SHDSL NTU.

The 7996-A2-374 is a Network Termination Unit (NTU) that utilizes SHDSL technology, combining the best of 2B1Q SDSL and HDSL2 to achieve fast and efficient data transmission in both directions, over a single copper telephone line.

The 7996-A2-374 has an industry standard E1 interface. Based on TC-PAM coding, the 7996-A2-374 supports data rates of up to 2,048 kbps. It is suitable for leased line applications such as video conferencing, Internet access, and Digital Data Network (DDN) access.

Featuring remote control capability, the local 7996-A2-374 is able to perform configuration, performance monitoring, querying, diagnostics, and all maintenance functions over the remote NTU via the DSL line.

1.2   Features

- TDM-based SHDSL NTUs guarantee real bandwidth without the large overhead required by ATM-based NTUs

- Full remote control capability via SHDSL Embedded Operation Channel

- Complies with ITU-T G.991.2 (G.shdsl)

- E1 DTE interface

- Versatile loopbacks for diagnostics

- Built-in test pattern generator and detector

- SHDSL and E1 line performance monitoring (PM)

- 96-quarter-hour / 7-day PM storage

- Local control via RS-232 management port (VT100) and LAN port (Telnet access)

- SNMP management through Ethernet LAN port

- Software download capability

1.3 Applications

Figure 1-1 shows the applications of the 7996-A2-374 SHDSL NTU.
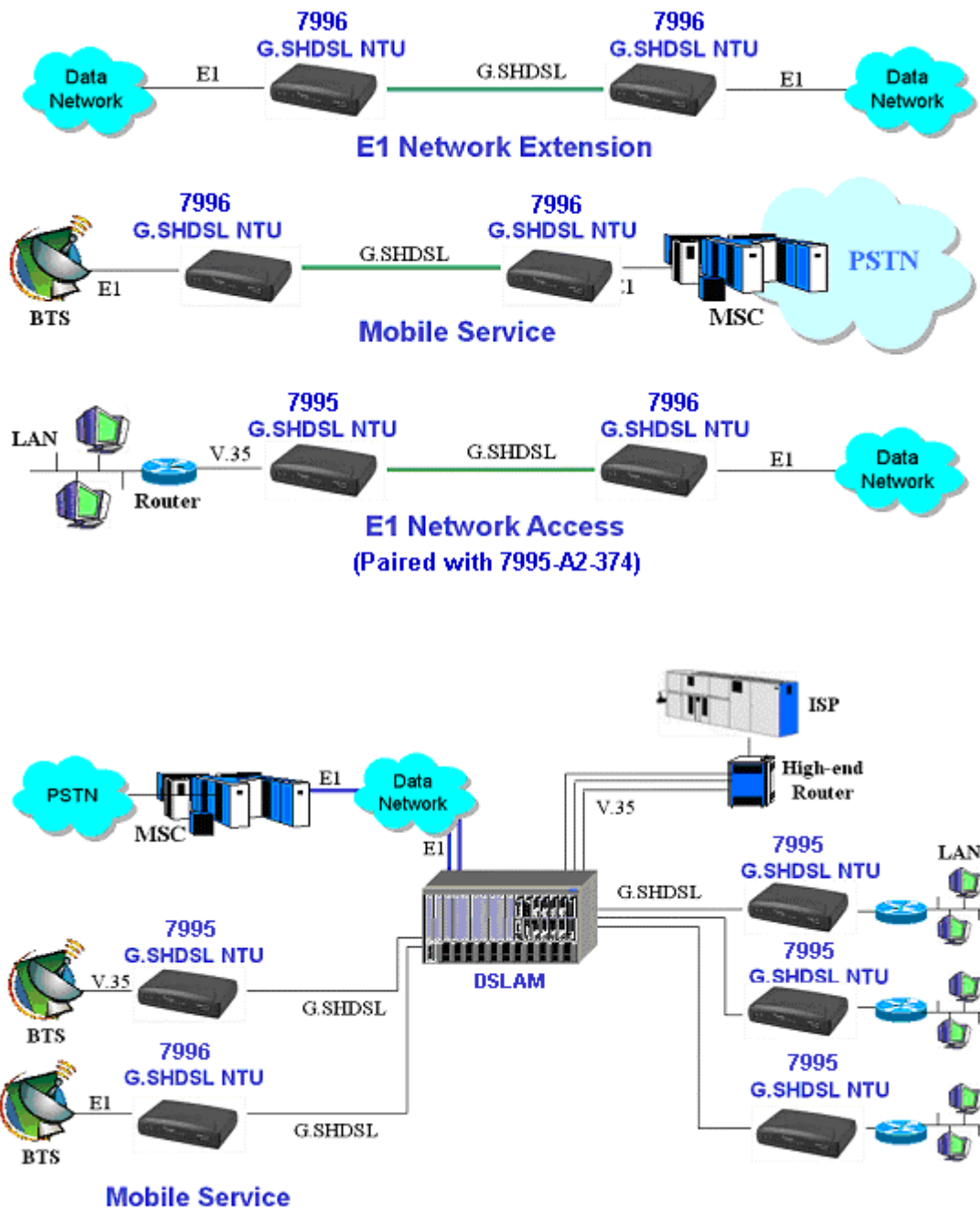
Figure 1-1 Applications of 7996-A2-374

1.4 Front Panel LED Indicators

The 7996-A2-374 has eight LED indicators. These LEDs indicate power status, diagnostics, machine status, data activity, and alarm conditions.

Figure 1-2 7996-A2-374 Front View

LED Indicator	Color	Mode	Function
POWER	Green	On	Power is supplied
		Off	No power is connected
TEST	Green	On	Bit Error testing
		Blink	Self testing
		Off	Normal operation
NT	Green	On	NT mode enabled
		Off	LT mode enabled
ALARM	Red	On	Major alarm detected
		Off	No major alarm detected
LB	Yellow	On	Loopback testing
		Off	Normal operation
E1	Green	On	E1 connection is working
		Off	E1 connection is not working
DSL LOS	Red	On	Loss of signal (DSL link is out of service or not connected)
		Blink	DSL link is training
		Off	DSL link is connected
ERR	Yellow	On	Self-test error
		Blink	Bit error test error
		Off	Normal operation

Table 1-1 7996-A2-374 LEDs

Note: The average training period for the SHDSL line is one minute and forty seconds. If the training period exceeds three minutes, or it fails (the DSL LOS LED keeps blinking), it means the line quality is poor or the link distance is too long for the SHDSL NTU to train. Contact your service provider.

Chapter 2   Hardware Installation

2.1   Rear Panel Connectors

There are two types of rear panels for the 7996-A2-374. Their only difference is the power supply: –48 VDC or 110/220 VAC.

Figure 2-1 7996-A2-374 Rear Panel Connectors – DC power

Figure 2-2 7996-A2-374 Rear Panel Connectors – AC power

Interface	Description
–48V FG PG Power	The –48 VDC version has three pins: –48V, FG, PG (Fig.2-1). The AC version has a power jack and a power switch (Fig.2-2).
Console	DB9 female connector for connection to a PC COM port
LAN	RJ45 connector for SNMP network management
E1	RJ45 connector for a 120 ohm, balanced E1 interface
TX and RX	BNC connector for a 75 ohm, unbalanced E1 interface
LINE	RJ45 connector for the SHDSL connection

Table 2-1 7996-A2-374 Rear Connectors

2.2   Installation

Follow the step-by-step instructions below for the hardware installation:

Step 1 Connect the LINE port to your DSL line.

Step 2 Connect the LAN port to the SNMP management network with an RJ45 connector cable.

Step 3 Connect the E1 interface to the Data network.

Step 4 Connect the Console port to the VT100 compatible terminal or PC COM port with an RS232 cable.

Step 5 Connect the Power to the power input.

For the DC version, connect the power pins as follows:

- **–48V:** Connect to –48VDC power supply source.

- **PG:** Connect to the ground of –48VDC power supply source.

- **FG :** Connect to the frame ground.

For the AC version, connect the Power jack to the power cable of the 110 or 220 VAC power adapter.

Step 6 After power on (for the AC version, turn the power switch to the ON position), the 7996-A2-374 performs a self-test. During the self-test, all LEDs will keep flashing back and forth sequentially. The test items include system RAM, flash memory and application software. If an error is found in RAM, the ALARM LED will be ON. If an error is found in flash memory or application software, the ALARM LED will keep flashing.
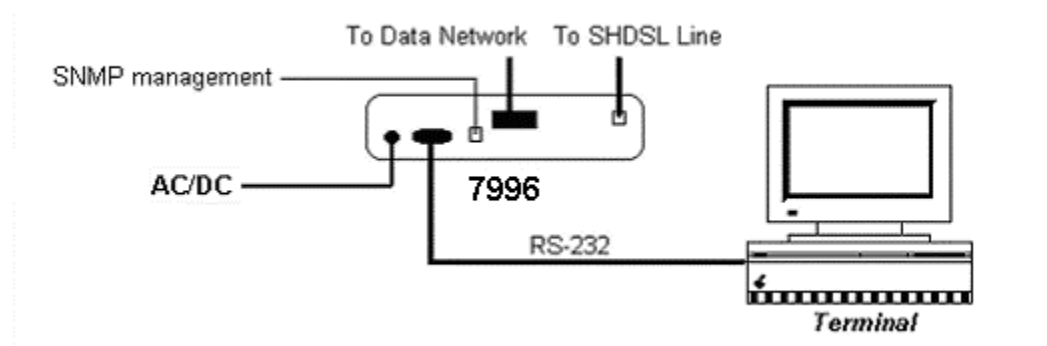
Caution: If the SHDSL NTU fails to power on, or it malfunctions, first verify that the power supply is correctly connected, and then power it on again.

Chapter 3   Management

This chapter describes the three ways to manage the SHDSL NTU: Console, Telnet and SNMP. Chapters 4 to 6 cover the configuration and maintenance of the SHDSL NTU in a console or Telnet session.

3.1   Console Management

Configure the following parameters for your VT100 terminal emulation program:

● Baud rate: 38,400 bps

● Parity: None

● Data bits: 8

● Stop bit: 1

● Flow control: None

After the session parameters are set up, start the VT100 emulator program on the PC. The **Press Any Key to Login…** message will be shown in the middle of the screen. Press any key. When the login prompt appears, type the password and press the **Enter** key to display the main menu as shown below. For initial login, no password is required.

```
SHDSL/E1 DSU             HW Version:1.06        SW Version:2.08
NE Mode: LT              Selected Device: Local    Name:
                                            17:15:29 06/23/2004_


MAIN MENU
      Select Device
      Select NE Mode(LT/NT)
      Configuration
      Current Alarm & Status
      Performance Statistics
      Threshold Setup
      Alarm History
      Test & Loopback Status
      Configuration Database Maintenance
      Reset & Software Download
      Logout




Up, Down Arrow: Field Move; Ctrl+X: Exit; Enter: Confirm        <WRITE>
```

Figure 3-1 Main Menu

Press the **Up** and **Down** arrow keys to select fields, and press the **Left** and **Right** arrow keys to select the parameters of fields. Type <**Ctrl-X** > to exit and <**Enter** > for confirmation.

The main menu includes the following fields:

- **Select Device (Local/Remote):** Select the SHDSL NTU to be configured. (Only appears in LT mode.)

- **Select NE Mode (LT/NT):** Select NT or LT operation mode.

- **Configuration:** Configure system parameters.

- **Current Alarm & Status:** Show the status of current alarms.

- **Performance Statistics:** Show the statistics of performance monitoring.

- **Threshold Setup:** Set the day and quarter threshold.

- **Alarm History:** View all of the alarm records.

- **Test & Loopback Status:** Perform a loopback, BER and self-test.

- **Configuration Database Maintenance:** Upload, download, save the configuration database, and set the configuration database to the factory defaults.

- **Reset & Software Download:** Perform a system reset or software download.

- **Logout:** Exit the system.

3.2   Telnet Management

The configurations in a Telnet session are the same as in console. To access the SHDSL NTU via Telnet, follow the steps below:

STEP 1: Connect the SHDSL NTU's LAN port to the Network Interface Card (NIC) in a PC using a crossover cable, or to an Ethernet hub using a straight-through cable.

STEP 2: In Windows, click on Start and choose Run. Type:

telnet xxx.xxx.xxx.xxx.

where xxx.xxx.xxx.xxx is the IP address of your SHDSL NTU. The default NTU IP address is **172.16.7.37**.

STEP 3: Refer to Chapters 4 to 6 to configure and maintain the SHDSL NTU.
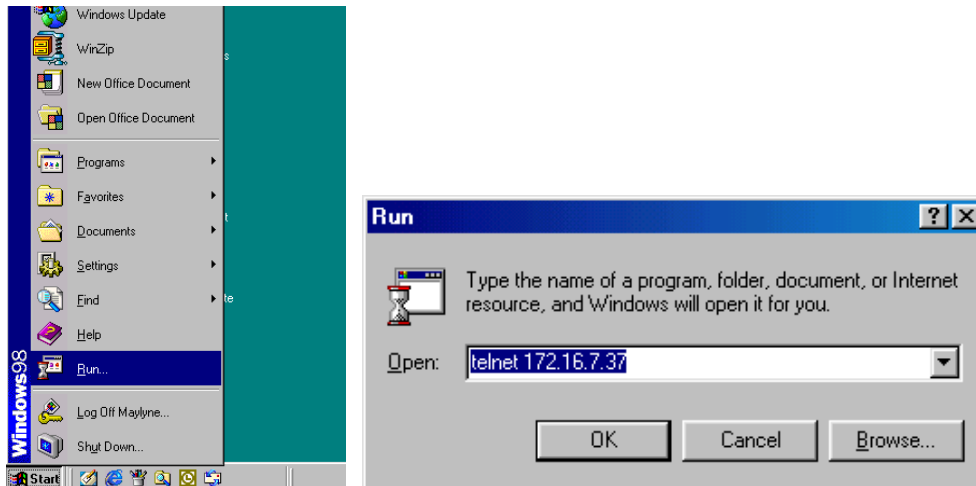
3.3   SNMP Management

To manage the NTU using SNMP, follow the steps below:

STEP 1: Connect the SHDSL NTU's LAN port to the Network Interface Card (NIC) in your PC with a cross-over cable, or an Ethernet hub with a straight-through cable.

STEP 2: Run your SNMP MIB browser to configure the SHDSL NTU. The default NTU IP address is 172.16.7.37.

Chapter 4   System Setup

4.1   Login

Configure the following parameters for your VT100 terminal emulation program.

- **Console session parameters** (factory default)

    Baud rate: 38400 bps

    Parity: None

    Data bits: 8

    Stop bit: 1

    Flow control: None

Run the VT100 emulator program. In a while, the **Press Any Key to Login…** message appears. Press any key. When a login prompt appears, type a password and then press the **Enter** key to display the main menu as shown below. No password is required the first time you log in.

```
SHDSL/E1 DSU              HW Version:1.06        SW Version:2.08
NE Mode: LT               Selected Device: Local    Name:
                                             17:15:29 06/23/2004_

MAIN MENU
    Select Device
    Select NE Mode(LT/NT)
    Configuration
    Current Alarm & Status
    Performance Statistics
    Threshold Setup
    Alarm History
    Test & Loopback Status
    Configuration Database Maintenance
    Reset & Software Download
    Logout



Up, Down Arrow: Field Move; Ctrl+X: Exit; Enter: Confirm        <WRITE>
```

Figure 4-1 Main Menu

4.2   Main Menu

Press the **Up** and **Down** arrow keys to select fields, and press the **Left** and **Right** arrow keys to select the parameters of fields. Type <**Ctrl-X** > to exit and <**Enter** > for confirmation.

The main menu includes the following fields:

- Select Device: Select the device to be configured. This field is only available in LT mode.

- Select NE Mode (LT/NT): Select NT or LT operation mode. The factory default is LT mode.

- Configuration: Configure system parameters.

- Current Alarm & Status: Show the status of current alarms.

- Performance Statistics: Show the statistics of performance monitoring.

- Threshold Setup: Set the thresholds for system performance monitoring.

- Alarm History: View and clear alarm records.

- Test & Loopback Status: Perform a loopback, BER and self-test

- Configuration Database Maintenance: Upload; download; save the configuration database; and set the configuration database to factory default.

- Reset & Software Download: Perform a system reset or software download

- Logout: Exit the system

4.3   Configuration

After you log in to the device, press the **Up** or **Down** arrow key to select the **Configuration** field from the main menu and then press the **Enter** key to go to the Configuration Menu.

Seven fields can be selected from the Configuration Menu. The detail of each field is explained in the following sections. Figure 4-2 shows the content of the configuration menu.

```
                                              Selected Device: Local
CONFIGURATION MENU                     Exit
    System Configuration
    Management Port Configuration
    System Date and Time Setting
    Change Password
    SNMP Configuration
    SHDSL Configuration
    E1 Configuration




Up, Down Arrow: Field Move; Ctrl+X: Exit; Enter: Confirm              <WRITE>
```

Figure 4-2 Configuration Menu

4.3.1   System configuration

Select **Main Menu>Configuration>System Configuration** to go to the System Configuration screen shown in Figure 4-3. The following parameters can be configured there.

■ **Device Name**: Enter proper characters for system identification. The maximum length of the device name is eight characters. Only alphabetic and numeric characters are valid.

■ **Timing Source**: In LT Mode, the user can choose a timing source (Internal, E1-LOOP, SHDSL-LOOP, or Independent) by using the Left and Right arrow keys. In NT Mode, the timing source is not configurable.

Note: To receive the clock from the E1 interface at both sides, both of the 7996-A2-374 devices should be set to Independent.

Use the **Up/Down** arrow key to exit or confirm the setting.

```
                                          Selected Device: Local
CONFIGURATION MENU                Exit      Confirm

     Device Name:             _

     Current Timing Source:   Internal

     Timing Source:           Internal E1-LOOP SHDSL-LOOP Independent



Up, Down Arrow: Field Move; Ctrl+X: Exit                    <WRITE>
```
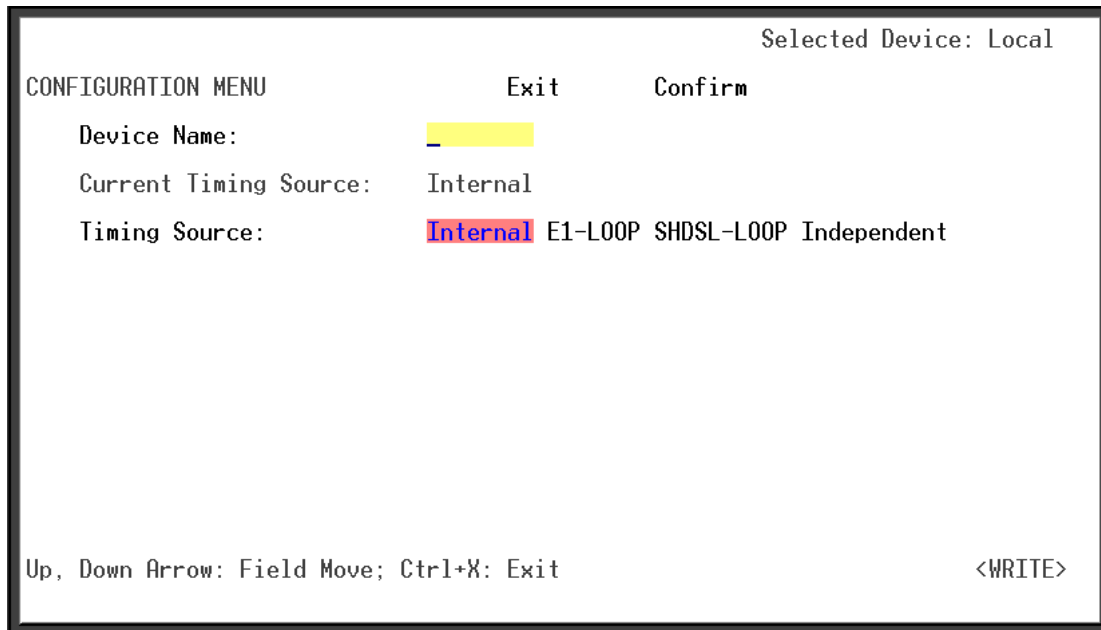
Figure 4-3 System Configuration Screen

4.3.2   Local Management Port Configuration

Select **Main Menu>Configuration>Management Port Configuration** to go to the Local Management Port Configuration screen shown in Figure 4-4. The factory-default setting for Baud Rate is 38400 bps. Press the **Left** or **Right** arrow key to select Baud Rate and use the **Up** or **Down** arrow key to exit or confirm the setting.

```
                                          Selected Device: Local
MANAGEMENT PORT CONFIGURATION        Exit    Confirm


     Baud Rate:           9600 19200 38400 57600 115200
     Start Bit:           1 bit
     #Bits and Parity:    8 bits, No parity
     Stop Bit:            1 bit
     XON/XOFF:            Off






Up, Down Arrow: Field Move; Ctrl+X: Exit; Ctrl+W: Confirm    <WRITE>
```
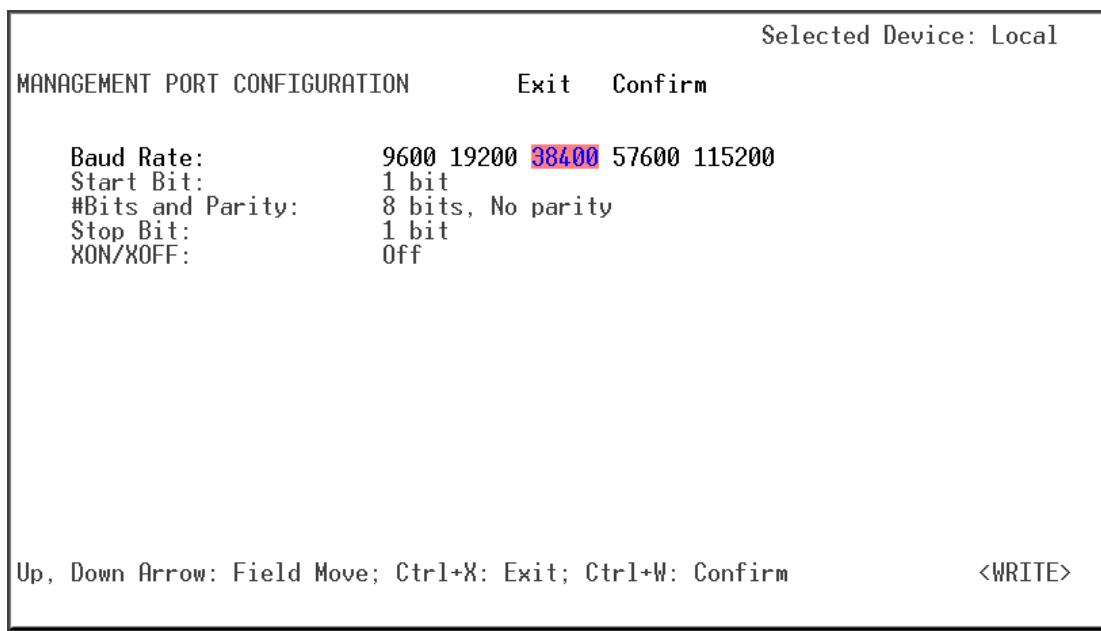
Figure 4-4 Local Management Port Configuration Screen

4.3.3   System Date and Time Setting

Select **Main Menu>Configuration>System Date and Time Setting** to go to the System Date and Time Setting screen shown in Figure 4-5.
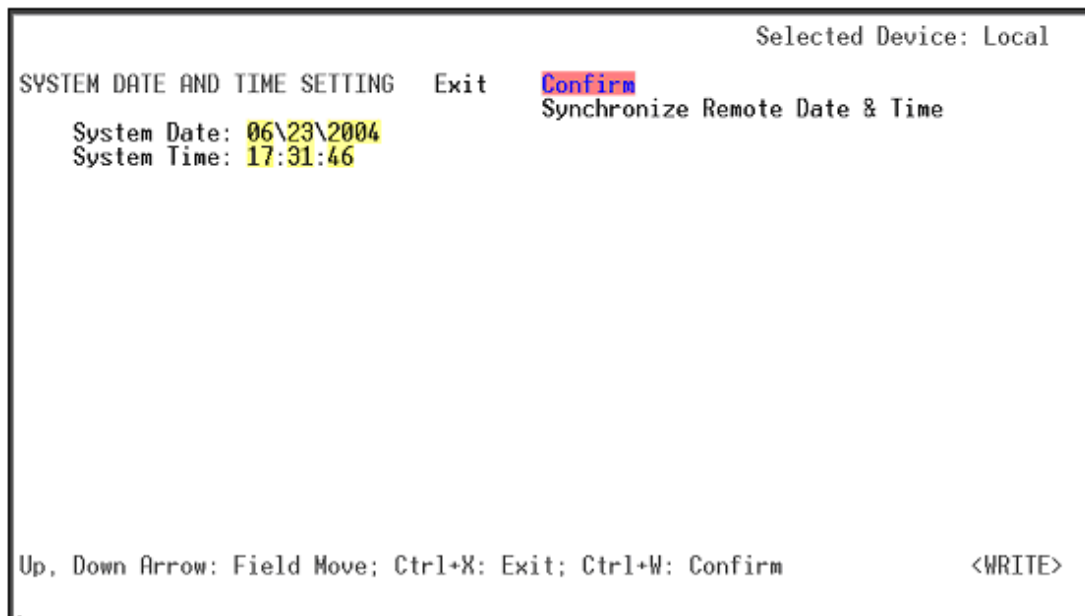
Figure 4-5 System Date and Time Setting Screen

Select **Synchronize Remote Date & Time** to synchronize the system date and time of the remote device with the local machine.

4.3.4   Password Change

For security purposes, set up the password after initial login.

Select **Main Menu>Configuration>Change Password** to enter the System Change Password screen, which is shown in Figure 4-6.

```
                                          Selected Device: Local

PASSWORD CONFIGURATION

    Enter Old Password:          _

    Enter New Password:          ****
    Enter New Password Again:    ****
```

Figure 4-6 Password Configuration Screen

Note 1: The maximum length of the password is eight characters.
Note 2: Only alphabetic and numeric characters may be used for the password.
Note 3: Every time you change the password, remember to save the configuration
        database.

4.3.5   SNMP & TFTP Configuration

Before connecting to the SNMP management system, configure the following parameters. The parameters for SNMP configuration are explained as the following:

■ Node IP Address: Specify the IP address for the device. The default address is 172.16.7.37.

■ Node IP Subnet Mask: Specify a subnet mask for the IP address. The default mask is 255.255.0.0.

■ Gateway IP: Set a gateway IP address. The default address is 172.16.7.40.

■ Trap IP Address 1: Set the host IP address for traps.

■ Trap Port 1: 162 (default), 62000, 62001, 62002 (three optional ports).

■ Trap IP Address 2: Set the second host IP address for traps.

■ Trap Port 2: 162 (default), 62000, 62001, 62002 (three optional ports).

■ Read Community String: Enter a string for reading identification.

■ Write Community String: Enter a string for writing identification.

■ Trap Community String: Enter a string for device identification.

The user can define up to two trap hosts using the Trap IP address 1 and Trap IP address 2. Each trap port is also changeable. The default trap port is 162. The device sends traps to these hosts when the traps are generated. If a trap host is on the same IP subnet as the device, the trap can be sent to the host directly; otherwise, a gateway must be used. Figure 4-7 shows all of the parameters for SNMP configuration.

The parameters for TFTP configuration are:

■   File Server IP Address: Enter the IP address of the TFTP server.

■   Software Download Filename: Enter the file name for software upgrade.

■   Configuration Database Up/Download Filename: Enter the file name for the configuration database uploading or downloading.

```
                                              Selected Device: Local

SNMP CONFIGURATION                   Exit    Confirm

     Node IP Address:            172.16 .7  .37
     Node IP Subnet Mask:        255.255.0  .0
     Gateway IP:                 172.16 .7  .40

     Trap IP Address 1:          0   .0  .0  .0
     Trap IP Port 1:             162 62000 62001 62002
     Trap IP Address 2:          0   .0  .0  .0
     Trap IP Port 2:             162 62000 62001 62002

     Read  Community String:     public
     Write Community String:     private
     Trap  Community String:     alert

     File Server IP Address :    172.16 .7  .7

     Software Download Filename:              load.img
     Configuration Database Up/Download Filename: vcdb.bin

Up, Down Arrow: Field Move; Ctrl+X: Exit; Ctrl+W: Confirm        <WRITE>
```

Figure 4-7 SNMP Configuration Screen

4.3.6   SHDSL Interface Configuration

The parameters in the SHDSL Interface Configuration menu are shown in Figure 4-8. The 7996-A2-374 can support two modes: transparency and non-transparency for E1. The **Data Rate** is fixed at the speed of 1544 kbps (N=24) for both modes.

Power backoff: In access networks, loop lengths and noise conditions differ significantly from pair to pair. While 13.5 dBm transmit power is required for worst-case noise conditions, many lines will not require such power levels. G.SHDSL includes a power back-off algorithm that enables modems to adjust their transmitting power according to conditions on the line. Operators can use this feature to manage and reduce crosstalk noise on the network.

GTI Standard: There are three options:

- Annex A (G.922.1 G.SHDSL Annex A compliant)

- Annex B (G.992.1 G.SHDSL Annex B compliant)

- Annex AB.

The LT mode supports Annex A and Annex B. The NT mode supports Annex A, Annex B and Annex AB. The default setting for LT is Annex A, and for NT is Annex AB. If the devices train with their default modes, Annex A will be used.

```
                                        Selected Device: Local

SHDSL INTERFACE CONFIGURATION          Exit      Confirm

    E1 Transparency(In LT, synchronize with NT):    Disable Enable
    Line Rate(N*64K):              0
    Power backoff:                 Disable Enable
    GTI Standard:                  Annex-A Annex-B
```

Figure 4-8 SHDSL Interface Configuration Screen

4.3.7   E1 Interface Configuration

When you select **Main Menu>Configuration>E1 Interface Configuration**, one of the two different E1 Interface Configuration screens is displayed. In the SHDSL Interface Configuration, if the field **E1 Transparency** is enabled, then the time slots of the E1 interface will be unconfigurable. The screen is shown in Figure 4-9. It allows the user to set the field **Line Drive** to **75 ohm** or **120 ohm**, and to enable the field **Local Loopback Send All 1**, but the field Line Code is not selectable. (It is fixed as HDB3.) A practical SHDSL line rate is shown at the bottom of the screen.

```
E1 CONFIGURATION                    Exit      Confirm


    Line Code: HDB3
    Line Drive: 75 ohm 120 ohm
    Local Loopback Send All 1: Disable Enable




    SHDSL Line Rate: 0
```

Figure 4-9 E1 Interface Configuration Screen I

Figure 4-10 shows another E1 interface configuration screen, when **E1 Transparency** is disabled from the SHDSL interface menu. The time slot becomes configurable. The **Line Drive** and **Local Loopback Send All 1** settings are explained in the previous section. The user can also select **Line Type**: E1 / E1-CRC and configure the **Time Slot Map**.

In the E1 time slot map, there are 31 user-selectable time slots. The user can enter **1** to enable, or **0** to disable the time slot. After completing the configuration, use the **Up/Down** arrow keys to highlight the **Confirm** field, and press **Enter** to confirm the settings.

```
E1 CONFIGURATION                    Exit      Confirm

    Line Type: E1 E1-CRC
    Line Code: HDB3
    Line Drive: 75 ohm 120 ohm
    Local Loopback Send All 1: Disable Enable

                 1  4   8   12  16  20  24  28 31
                 |  |   |   |   |   |   |   |  |
    Time Slot Map: 1111111111111111111111111111111

    SHDSL Line Rate: 0
```

Figure 4-10 E1 Interface Configuration Screen II

4.4   Logout

To log out of the system, move the cursor to the **Logout** field from the main menu by using the **Up** or **Down** arrow key.

```
SHDSL/E1 DSU                  HW Version:1.06        SW Version:2.08
NE Mode: LT                   Selected Device: Local    Name:
                                                   18:08:48 06/23/2004

MAIN MENU
     Select Device
     Select NE Mode(LT/NT)
     Configuration
     Current Alarm & Status
     Performance Statistics
     Threshold Setup
     Alarm History
     Test & Loopback Status
     Configuration Database Maintenance
     Reset & Software Download
     Logout
```

Figure 4-11 System Logout

After pressing the **Enter** key, a prompt as shown below will ask you to Press any key to login.

```
                              CONSOLE
             Press Any Key to Login..._
```

Then you are prompted to log in once again.

Chapter 5   Operation Mode

There are two access privileges for system operation: **Read mode** and **Write mode**. In Read mode, the user can only view information from the terminal except changing the password. In Write mode, the user can view system information and change system parameters from the terminal. Figure 5-1 shows how this is indicated: <**WRITE>** is displayed in the lower right corner of the screen, showing the system is managed in Write mode.

```
SHDSL/E1 DSU                    HW Version:1.06        SW Version:2.08
NE Mode: LT                     Selected Device: Local    Name:
                                                 19:43:30 06/23/2004_


MAIN MENU
      Select Device
      Select NE Mode(LT/NT)
      Configuration
      Current Alarm & Status
      Performance Statistics
      Threshold Setup
      Alarm History
      Test & Loopback Status
      Configuration Database Maintenance
      Reset & Software Download
      Logout




Up, Down Arrow: Field Move; Ctrl+X: Exit; Enter: Confirm        <WRITE>
```

Figure 5-1 Operation Mode Indication

Upon first login, you will enter the Write mode. A password is not required upon initial login.

> **Note**: When the same password is used for both modes, Write mode always gets a higher priority. You can change the password for both modes by selecting **Main Menu>Configuration> Change Password**.

5.1   Selecting Device

Select **Main Menu>Select Device** to configure the local or remote device. This field is only available in LT mode. The default setting of the **Select Device** is **local**. If you change **Select Device** to **Remote** shown in Figure 5-2, you can configure the remote device via the DSL line.

```
SELECT DEVICE       Exit        Confirm


    SELECT DEVICE:Local    Remote
```

Figure 5-2 Select Device Menu

The main menu of the remote configuration is a little different from that of the local configuration. Figure 5-3 shows the fields included in the remote Main Menu: Select NE Node, Configuration, Current Alarm Status, Performance Statistics, Threshold Setup, DTE Status, Loopback Status, Configuration Database Maintenance, Reset and Return to Local. The details of these fields are the same as those of the local main menu and have been explained in other sections. Select the **Return to Local** field to go back to the local device configuration.

```
SHDSL/T1 DSU                    HW Version:1.06        SW Version:2.08
NE Mode: NT                     Selected Device: Remote  Name:


MAIN MENU
    Select NE Mode
    Configuration
    Current Alarm & Status
    Performance Data
    Threshold Setup
    Loopback Status
    Configuration Database Maintenance
    Reset
    Return to Local
```

Figure 5-3 Remote Device Configuration Main Menu

5.2   Selecting Mode

Select **Main Menu>Select NE Mode (LT/NT)** to configure device mode: LT (Line Termination or NT (Network Termination). The **Select NE Mode Menu** is shown in Figure 5-4. The factory default is LT mode.

SELECT NE Mode   **Exit**   Confirm

SELECT NE:**LT** NT

Figure 5-4 Select NE Mode Menu

The NT LED on front panel will light when NT is selected.

■ **NT Mode**: System timing is not configurable in this mode. The default first priority is from **SHDSL-LOOP**, the second is from Internal.

■ **LT Mode**: You can set the timing to **Internal**, **SHDSL-LOOP, E1-LOOP** and **Independent.**

Chapter 6   Maintenance

The chapter describes performance monitoring, alarm monitoring, and loopback test.

6.1   Performance

The SHDSL NTU allows you to perform SHDSL Performance Monitoring and E1 Performance Monitoring, set up thresholds for the SHDSL Interface, and set up thresholds for the E1 Interface.

6.1.1   SHDSL Performance Monitoring

Select **Main Menu>Performance Statistics** to enter the Performance Data Menu shown in Figure 6-1. You can select either the **SHDSL Performance** or **E1 Performance** field on the menu. To configure SHDSL performance monitoring, choose **SHDSL Performance**.

```
Performance Data                      Exit

    SHDSL Performance
    E1 Performance
```
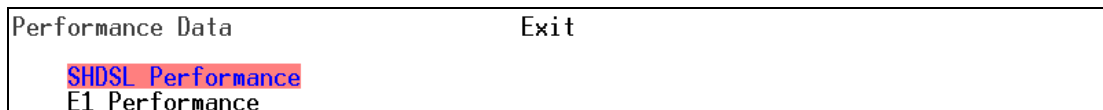
Figure 6-1 Performance Data Menu

In both the **SHDSL Performance** and **E1 Performance** menus, the performance of near and far ends can be monitored. The reporting of all performance data is per quarter hour. You can view the data of the current quarter-hour, previous 96 quarter-hours, or current and previous 7 days, or choose the **Clear Performance Data** option to clear the data from both the Near-End and Far-End. Figures 6-3 to 6-5 show example screens for SHDSL performance monitoring.

```
SHDSL Performance Data                Exit

  Near End
    Current Quarter
    Previous 96 Quarters
    Current & Previous 7 Days
    Clear Performace Data

  Far End
    Current Quarter
    Previous 96 Quarters
    Current & Previous 7 Days
    Clear Performace Data

                                    |
  SNR :  0 (dB)
```

Figure 6-2 SHDSL Performance Data Menu

The NTU monitors four parameters: ES, SES, UAS, and LOSW.

- **ES (Errored Seconds):** Specifies the amount of seconds with one or more CRC errors.

- **SES (Severely Errored Seconds):** Specifies the amount of seconds with 25 or more CRC errors.

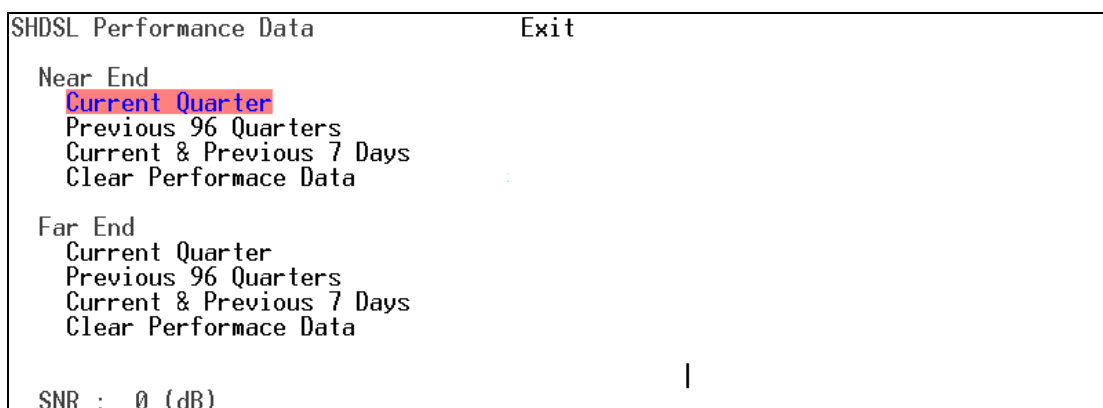- **UAS (Unavailable Seconds):** Counts the cumulative number of seconds in which the interface was unavailable during the measured period.

- **LOSW:** Loss of Synchronization Word.

Update the monitored data immediately by selecting **Refresh**. The parameter **Elapsed Seconds** represents the time (in seconds) passed in the current quarter hour. The maximum value of the Elapsed Seconds is 900 seconds.

```
                                          Selected Device: Local

NEAR END SHDSL - CURRENT QUARTER PERFORMANCE          Exit       Refresh

     Elapsed Seconds:      91

           ES        SES       UAS       LOSW
         0000000   0000000   0000091   0000091
```

Figure 6-3 Current Quarter Performance Screen for SHDSL

In the screen containing the Previous 96 Quarters Performance, you can press the Left and Right arrow keys on the fields of **Performance Data** to select the monitored parameter (ES, SES, UAS or LOSW). Then press the **Enter** key to view the data for the day.

```
                                          Selected Device: Local

NEAR END SHDSL - PREVIOUS 96 QUARTERS PERFORMANCE          Exit

     Performance Data: ES SES UAS LOSW

  -- ES   Last 96 Quarters:

            1         2         3         4         5         6         7         8
01-08  0000006   0000000   0000000   0000000   0000000   0000000   0000000   0000000
09-16  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
17-24  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
25-32  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
33-40  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
41-48  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
49-56  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
57-64  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
65-72  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
73-80  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
81-88  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000
89-96  0000000   0000000   0000000   0000000   0000000   0000000   0000000   0000000

<-, ->: Select; ENTER: List; ^X: Return                          <WRITE>
```

Figure 6-4 Previous 96 Quarters Performance Screen for SHDSL

On the **Current & Previous 7 Days Performance** screen, data for the previous seven days and information about valid intervals are displayed. For the statistics of a current day, the number of **valid intervals** is counted per quarter hour. The accumulation of the number starts from the beginning of a day. Select **Refresh** to update the monitored data.

```
                                              Selected Device: Local
NEAR END SHDSL - CURRENT & PREVIOUS 7 DAYS PERFORMANCE      Exit       Refresh

      Valid Intervals:       10

                     ES        SES       UAS       LOSW
Current Day      0000006   0000000   0008218   0008218
Last 1st Day     0000000   0000000   0000000   0000000
Last 2nd Day     0000000   0000000   0000000   0000000
Last 3rd Day     0000000   0000000   0000000   0000000
Last 4th Day     0000000   0000000   0000000   0000000
Last 5th Day     0000000   0000000   0000000   0000000
Last 6th Day     0000000   0000000   0000000   0000000
Last 7th Day     0000000   0000000   0000000   0000000
```

Figure 6-5 Current & Previous 7 Days Performance Screen for SHDSL

Clear the current or history performance data by selecting the **Main Menu>Performance Statistics> SHDSL Performance> Clear Performance Data** option. First, select a performance type: **Current** or **History**. Second, select a parameter (**ES**, **SES**, **UAS** or **ALL**) for the Performance Data field. Then select **Clear** to perform the clearing of the data. The screen is shown in Figure 6-6.

```
                                              Selected Device: Local
NEAR END SHDSL - CLEAR PERFORMANCE DATA        Exit       Clear

     Performance Type: Current History

     Performance Data: ES SES UAS LOSW ALL
```

Figure 6-6 Clear Performance Data Screen for SHDSL

6.1.2 E1 Performance Monitoring

Select **Main Menu> Performance Statistics> E1 Performance** to go to the E1 performance monitoring screen. Figures 6-7 to 6-9 show example screens for the E1 performance monitoring.

The E1 performance monitoring for the current quarter-hour is shown in Figure 6-7. The parameters that are monitored are:

- **LCV (Line Coding Violation):** The occurrence of either a Bipolar Violation (BPV) or Excessive Zeroes (EXZ) error event.

- **PCV (Path Coding Violation):** A frame synchronization bit error in the E1-noCRC formats, or a CRC or frame synch. bit error in the E1-CRC formats.

- **ES (Errored Seconds):** A second with one or more PCV events, CS events, Out of Frame defects or a detected AIS defect.

- **SES (Severely Errored Seconds):** A second with 832 or more PCV error events OR one or more Out of Frame defects.

- **SEFS (Severely Errored Framing Seconds):** A second with one or more Out of Frame defects or a detected AIS defect.

- **UAS (Unavailable Seconds):** Calculated by counting the number of seconds that the interface is unavailable.

- **CSS (Controlled Slip Seconds):** A one-second interval containing one or more controlled slips.

- **DM (Degraded Minutes):** The minutes in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.

- **CS (Controlled Slip):** The replication or deletion of the payload bits of a frame.

- **FE (Framing Error):** The occurrence of a particular density of Framing Error events, Out of Frame.

Select **Refresh** to update the monitored data immediately. The parameter **Elapsed Seconds** represents the time passed (in seconds) in the current quarter-hour. The maximum value of the Elapsed Seconds is 900 seconds.

```
                                              Selected Device: Local

NEAR END E1 - CURRENT QUARTER PERFORMANCE               Exit      Refresh

    Elapsed Seconds:      880

       LCV      PCV      ES     SES    SEFS     UAS     CSS     DM     CS     FE
    0000000    N/A    00000   00000  000000  000880   00000   N/A   00000   N/A
```

Figure 6-7 Current Quarter Performance Screen for E1

Figure 6-8 shows an example screen for the Previous 96 Quarters Performance reporting. Use the **Left/Right** arrow keys to select the reporting criteria for the **Performance Data** by choosing the applicable monitored parameter. After selecting a parameter, press the **Enter** key to confirm the new value, and to view the monitored data for a particular day.

```
                                              Selected Device: Local
NEAR END E1 - PREVIOUS 96 QUARTERS PERFORMANCE            Exit

     Performance Data: LCV PCV ES SES SEFS UAS CSS DM CS FE

 -- PCV  Last 96 Quarters:

            1       2       3       4       5       6       7       8
01-08     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
09-16     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
17-24  |  N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
25-32     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
33-40     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
41-48     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
49-56     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
57-64     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
65-72     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
73-80     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
81-88     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
89-96     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A

<-, ->: Select; ENTER: List; ^X: Return               <WRITE>
```

Figure 6-8 Previous 96 Quarters Performance Screen for E1

On the **Current & Previous 7 Days Performance** screen, shown below, the data of the previous seven days and the information about valid intervals are displayed. For the statistics of a current day, the number of **valid intervals** is counted per quarter. The accumulation of the number starts from the beginning of a day. Use the **Refresh** command to update the data that is monitored.

```
NEAR END E1 - CURRENT & PREVIOUS 7 DAYS PERFORMANCE      Exit      Refresh

     Valid Intervals:    11

        LCV      PCV     ES      SES     SEFS     UAS     CSS     DM     CS     FE
Cur  0000000    N/A    00000   00000   000000   001789  00000   N/A   00000   N/A
Lst1 0000000    N/A    00000   00000   000000   000000  00000   N/A   00000   N/A
Lst2 0000000    N/A    00000   00000   000000   000000  00000   N/A   00000   N/A
Lst3 0000000    N/A    00000   00000   000000   000000  00000   N/A   00000   N/A
Lst4 0000000    N/A    00000   00000   000000   000000  00000   N/A   00000   N/A
Lst5 0000000    N/A    00000   00000   000000   000000  00000   N/A   00000   N/A
Lst6 0000000    N/A    00000   00000   000000   000000  00000   N/A   00000   N/A
Lst7 0000000    N/A    00000   00000   000000   000000  00000   N/A   00000   N/A
```

Figure 6-9 Current & Previous 7 Days Performance Screen for E1

Clear the current or history performance data by selecting the **Main Menu>Performance Statistics> E1 Performance> Clear Performance Data** option. First, select a performance type: **Current** or **History**. Second, select a parameter for the Performance Data field. Then select **Clear** to perform the clearing of the data. The screen is shown below.

```
NEAR END E1 - CLEAR PERFORMANCE DATA          Exit      Clear

     Performance Type: Current History

     Perfromance Data: ALL LCV PCV ES SES SEFS UAS CSS DM CS FE
```

Figure 6-10 Clear Performance Data Screen for E1

6.1.3   Threshold Setting for SHDSL Interface

Select **Main Menu>Threshold Setup** to go to the menu of **Performance Threshold Set** shown below. Two fields can be selected: **SHDSL threshold** and **E1 threshold**. Press the **Up** or **Down** arrow key to select **SHDSL Threshold**.

```
Performance threshold Setup          Exit

     SHDSL threshold
     E1 threshold
```

Figure 6-11 Threshold Set Menu

The threshold is expressed in seconds. The valid range of the threshold for a quarter hour is from 0 to 900 seconds, and the valid range for a day is from 0 to 86400 seconds. The Unit for parameter SNR and Loop Attenuation are expressed as decibels. For SNR, (signal-to-noise ratio) the valid range of the threshold is from 1 to 15 dB. For Loop Attenuation, the valid range is from 1 to 127 dB. Once these thresholds are set, an alarm will be generated when the error detected is greater than the thresholds within the interval.

```
SHDSL THRESHOLD SETUP               Exit    Confirm

     Parameters              Threshold for quarter   Threshold for day
     ES:                          900                    86400
     SES:                         900                    86400
     UAS:                         900                    86400
     LOSW:                        900                    86400
     SNR Margin:1~15              1
     Loop Attenuation:1~127       86
```

Figure 6-12 SHDSL Threshold Setup Screen

6.1.4   Threshold Setting for E1 Interface

Select **Main Menu>Threshold Setup> E1 Threshold Setup** to display the E1 THRESHOLD
SETUP screen, shown below.

```
E1 THRESHOLD SETUP                    Exit    Confirm

    Parameters      Threshold for quarter     Threshold for day
       LCV:              65535                     86400
       PCV:              65535                     86400
       ES:               900                       86400
       SES:              900                       86400
       SEFS:             900                       86400
       UAS:              900                       86400
       CSS:              900                       86400
       DM:               15                        1440
```

Figure 6-13 E1 Threshold Setup Screen

On the screen, the threshold units for ES, SES, SEFS, UAS and CSS are counted in seconds. The
valid range for the threshold per quarter-hour is from 0 to 900 seconds, and the valid range for a
day is from 0 to 86400 seconds. The threshold of the DM parameter is counted in minutes, with
the valid quarter-hourly threshold range from 0 to 15 minutes, and daily range from 0 to 1440
minutes. The thresholds of LCV and PCV are counted by the number of times error events
occurred. After these thresholds are set, an alarm will be generated when the errors counted
exceeds the specified threshold intervals.

6.2   Alarm Monitoring

The Alarm Monitoring menu displays current alarm status and alarm history, and allows you to clear alarms.

6.2.1   Viewing Current Alarm Status

Select **Main Menu>Current Alarm & Status** to view the device's current alarm status. The system provides two classes of alarms: **major** and **minor**. Use the **Up/Down** arrow key to select field **Exit** for page exit, **Refresh** for updating data, **PgUp** for page up, and **PgDn** for page down.

```
CURRENT ALARM STATUS        Exit      Refresh    PgUp PgDn              PAGE 1

    Alarm Type                                  Class    Time
01.(SHDSL)Loss of signal                        MAJOR    20:44:55 06/23/2004
02.(E1)Loss of signal                           MAJOR    20:44:55 06/23/2004

    .....END OF ALARM RECORDS.....
```

Figure 6-14 Current Alarm Status Screen

6.2.2   Viewing Alarm History

Select **Main Menu>Alarm History** to view the device alarm history. Use the Refresh function to update the status and press the PgUp and PgDn keys to switch the page. To clear the device alarm history, use the **Clear** function.

```
ALARM HISTORY               Exit      Refresh    Clear     PgUp PgDn    PAGE 1
    Alarm Type                                  Class    Time
01.(SHDSL)Loss of signal                        MAJOR    17:57:05 06/23/2004
02.(SHDSL)SNR exceed threshold                  MINOR    17:57:05 06/23/2004
03.(E1)Loss of signal                           MAJOR    17:57:05 06/23/2004
04.(SHDSL)Loss of signal                         clr     20:03:47 06/23/2004
05.(SHDSL)SNR exceed threshold                   clr     20:03:53 06/23/2004
06.(SHDSL)Loss of signal                        MAJOR    20:04:01 06/23/2004
07.(SHDSL)Loss of signal                         clr     20:04:21 06/23/2004
08.(SHDSL)SNR exceed threshold                  MINOR    20:04:21 06/23/2004
09.(SHDSL)SNR exceed threshold                   clr     20:04:29 06/23/2004
10.(SHDSL)Loss of signal                        MAJOR    20:05:12 06/23/2004

    .....END OF ALARM RECORDS.....
```

Figure 6-15 Alarm History Screen

6.3 Loopback Test

Select **Main Menu>Test & Loopback Status** to enter the TEST AND LOOPBACK Menu shown in Figure 6-16. From the Test and Loopback Status menu you can execute SHDSL, E1 and system tests. The system allows only one loopback at a time.

```
TEST AND LOOPBACK MENU              Exit

    SHDSL
        Loopback
        BER Test

    E1
        Loopback
        BER Test

    SYSTEM
        Selftest
```

Figure 6-16 Test and Loopback Menu

6.3.1 SHDSL Loopback Test

Select **Main Menu> Test & Loopback Status> SHDSL Loopback**, to go to the SHDSL loopback screen.

```
SHDSL LOOPBACK                      Exit

    Loopback Status: Release

    Set Loopback:      Release  Line  Local  Remote_Line  Remote_Payload
```

Figure 6-17 SHDSL Loopback Screen

There are four types of the SHDSL loopback.

- **Line loopback:** To perform a loopback toward the line.

- **Local loopback:** To perform a loopback toward the DTE. This loopback will terminate the SHDSL link.

- **Remote line loopback:** To perform the remote line loopback.

- **Remote payload loopback:** To perform the remote payload loopback.

To release a loopback, choose Release to return to normal operation.

6.3.2   SHDSL BER Test

Select **Main Menu> Test & Loopback Status> SHDSL BER Test** to enter the SHDSL BER test screen. The screen is shown in Figure 6-18. The fields in the screen are described below:

- Test Period: enter the time for testing. (00:00:00 specifies that the test will be continuous.)

- Test Pattern: 2047 and 2^15-1 patterns are available for the test. **Normal** means there is no pattern sent.

- Test Switch: Use the **Up/Down** key to move the cursor to this field and select **Start** to perform the test.

To perform the BER Test, you have to select a test pattern in the Test Pattern field first. Then move the cursor to **Start** in the Test Switch field and press **Enter** to start the test.

After performing a test, the test result will appear on the screen immediately. The test results include the statistics of Elapsed seconds, Bit Errors and Bit Error Ratio. Press the **E** key to stop the test, press **1–7** to set the rate for Error Insertion (where 1 means the rate is 10E-1, 2 means the rate is 10E-2, and so on), or press **0** to stop the error insertion.

During the test, the system will refresh the screen once per second.

```
BER TEST                          Exit

    TEST CONFIG

          Test Period:  00:00:00
          Test Pattern: Normal 2047 2^15-1
          TestSwitch:   Start


    RESULT  >> Under Test... {E: Stop Test; 1~7 Ins Err (rate= 10E-n, 0: Stop)}

          Elapsed Seconds: 3
          Bit Errors:      3072000
          Bit Error Ratio: 5.000*10E(-1)

          Pattern Sync Status: Out of Sync
```

Figure 6-18 SHDSL BER Test Screen
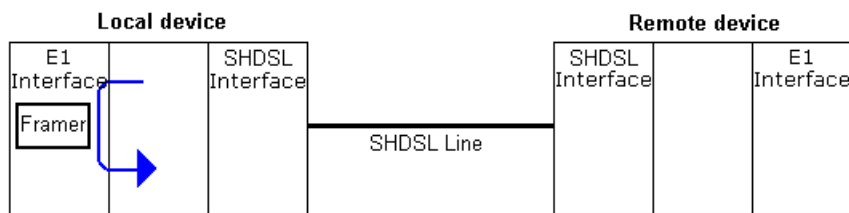
6.3.3　E1 Loopback Test

After entering **Main Menu>Test & Loopback Status>E1 Loopback**, shown in Figure 6-23, four fields can be chosen on the E1 loopback screen.

```
E1 LOOPBACK                        Exit

    Loopback Status: Release

    Set Loopback:      Release Local Line Payload
```
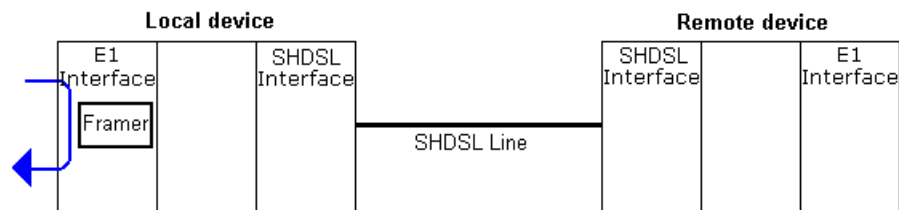
Figure 6-19 E1 Loopback Screen

On the screen, there are four fields selectable via the **Left/Right** arrow key and explained below:

- Release: Return to normal operation.
- Local: Perform an E1 local loopback test. The loopback diagram is shown below.
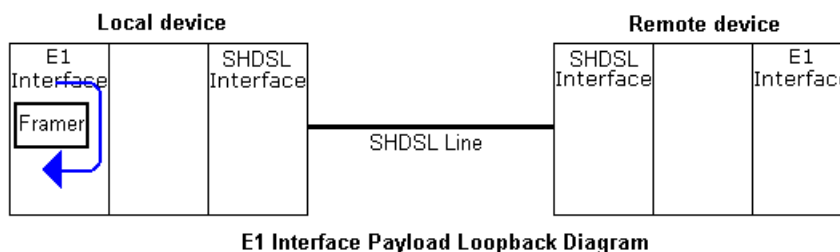

E1 Interface Local Loopback Diagram

- Line: Perform an E1 line loopback test. The loopback diagram is shown below.

E1 Interface Line Loopback Diagram

● Payload: Perform an E1 payload loopback test. The loopback diagram is shown below.

E1 Interface Payload Loopback Diagram

6.3.4   E1 BER Test

Select **Main Menu> Test & Loopback Status> E1 BER Test** to enter the E1 interface BER test screen. The screen is shown in Figure 6-24. The fields on the screen are described below:

● **Test Period:** Enter the time for testing. (00:00:00 indicates that the test will be continuous.)

● **Test Pattern:**   2047 and PRBS (2^15-1) patterns are available for the test. Parameter **Normal** indicates that there is no pattern sent.

● **Test Switch:** The user has to use the **Up/Down** key to move the cursor to this field and select **Start** to perform the test

After performing a test, the test result will appear on the screen immediately. The test results include the statistics of Elapsed seconds, Bit Errors and the Bit Error Ratio. Press the **E** key to stop the test, press **1–7** to set the rate for Error Insertion (where 1 means the rate is 10E-1, 2 means the rate is 10E-2, and so on), or press **0** to stop the error insertion.

Figure 6-20 E1 BER Test Screen

6.3.5 System Self-Test

Select **Main Menu>Test & Loopback Status>Self test** to perform a system self-test. The system will perform a self-test and then show the results on the screen. During the test, the traffic will be interrupted.

6.4 System Maintenance

You can save, upload, or download the configuration database, or restore the configuration database to the factory default setting from the Configuration Database Maintenance screen.

```
CONFIGURATION DATABASE MAINTENANCE    Exit

    Save Configuration Database
    Upload Configuration Database(X_Modem)
    Upload Configuration Database(TFTP)
    Download Configuration Database(X_Modem)
    Download Configuration Database(TFTP)
    Save Factory Default to Database
```

Figure 6-21 Configuration Database Maintenance Menu

6.4.1 Saving Configuration Database

Select **Main Menu> Configuration Database Maintenance> Save Configuration Database** to save the system configuration file. A message as shown below will appear for confirmation. Choose **Save** by using the **Up/Down** key. After the confirmation, the file will be saved in system flash memory.

```
SAVE CONFIGURATION DATABASE              Exit

    Do you really want to Save Configuration? Please confirm:
                         Save
```

Caution: Always perform this action after making any change from the menu.
Otherwise, the change will be lost after the system is restarted.

6.4.2   Uploading Configuration Database via X-modem

Select **Main Menu> Configuration Database Maintenance> Upload Configuration Database (X_Modem)** to upload the system configuration file via X-modem. A message as shown below will appear for confirmation. Choose **UpLoad** to perform the uploading. And then perform the following procedure.

```
UPLOAD CONFIGURATION DATABASE(X_MODEM) Exit

    Do you really want to upload configuration? Please confirm:

                        UpLoad
```

Procedure for upload:

Step 1 Select the function for **file transfer (receive/download)** from the terminal emulation program you use.
Step 2 Select **X-modem** protocol for file transfer.
Step 3 Enter the **file name** with the directory to be received.
Step 4 Execute the file transfer function.

Note: The maximum wait time for the system is 50 seconds. If a timeout message appears, repeat the above procedure.

6.4.3   Uploading Configuration Database via TFTP

Select **Main Menu> Configuration Database Maintenance> Upload Configuration Database (TFTP)** to upload the system configuration file via the TFTP server. A message as shown below will appear for confirmation. Choose **UpLoad**.

```
UPLOAD CONFIGURATION DATABASE(TFTP)     Exit

    Do you really want to upload configuration? Please confirm:

                        UpLoad
```

Note: Go to the **Main Menu>Configuration>SNMP Configuration** screen to enter the IP address of the TFTP server and the file name you would like to upload before performing the upload.

6.4.4 Downloading Configuration Database via X-modem

Select **Main Menu> Configuration Database Maintenance> Download Configuration Database (X_Modem)** to download the system configuration file via X-modem. A message as shown below will appear for confirmation. Choose **DownLoad**. Then perform the following procedure. The configuration file will be saved in flash memory.

```
DOWNLOAD CONFIGURATION DATABASE(X_MODEM)      Exit

    Do you really want to download configuration? Please confirm:

                            DownLoad
```

Procedure for download:

Step 1 Select the function for **file transfer (send/upload)** from the terminal emulation program you use.

Step 2 Select the **X-modem** protocol for file transfer.

Step 3 Enter the **file name** with the directory to be sent.

Step 4 Execute the file transfer function.

Note: The maximum wait time for the system is 50 seconds. If a timeout message appears, repeat the above procedure.

6.4.5 Downloading Configuration Database via TFTP

Select **Main Menu> Configuration Database Maintenance> Download Configuration Database (TFTP)** to download the system configuration file via the TFTP server. A message shown below will appear for confirmation. Choose **DownLoad**.

```
DOWNLOAD CONFIGURATION DATABASE(TFTP)         Exit

    Do you really want to download configuration? Please confirm:

                            DownLoad
```

Note: Go to the **Main Menu>Configuration>SNMP Configuration** to enter the IP address of the TFTP server and the file name you would like to download before performing the download.

6.4.6　　　Setting Configuration Database to Factory Default

Select **Main Menu> Configuration Database Maintenance> Save Factory Default to Database** to restore the system configuration file to factory default. A message shown below will appear for confirmation. Choose **Save** by using the **Up/Down** arrow key. The system will be restarted after the confirmation.

```
SAVE  FACTORY DEFAULT TO DATABASE                    Exit

    Do you really want to Save  Factory Default Configuration?

    After save ,system will RESET!! Please confirm:
                           Save
```

6.5　　　System Reset and Software Download

Select **Main Menu> Reset & Software Download** to download software and reset the system.

```
RESET & SOFTWARE DOWNLOAD MENU          Exit

    Reset
    Software Download(X_Modem)
    Software Download(TFTP)
    Remote Software Download(TFTP)
```

Figure 6-22 Reset & Software Download Menu

6.5.1　　　Reset

Select **Main Menu> Reset & Software Download>Reset** to perform a system reset. A message as shown below will appear for confirmation. Choose **Reset** by using the **Up/Down** key.

```
RESET               Exit

    Do you really want to reset software? Please confirm:
                           Reset
```

6.5.2   Software Download Via X-modem

Select **Main Menu> Reset & Software Download> Software Download (X_Modem)** to download the system software via X-modem. A message shown below will appear for confirmation. Choose **DownLoad** by using the **Up/Down** key. Then perform the following procedure for software download. After finishing the procedure, the application software will be updated.

```
SOFTWARE DOWNLOAD(X_MODEM)                Exit

    Do you really want to download new software? Please confirm:

                        DownLoad
```

Procedure for download:

Step 1 Select the function for **file transfer (send/upload)** from the terminal emulation program you use.
Step 2 Select **X-modem** protocol for file transfer.
Step 3 Enter the **file name** with the directory to be sent.
Step 4 Execute the file transfer function.

Note: The maximum wait time for the system is 50 seconds. If a timeout message appears, repeat the above procedure.

6.5.3   Software Download via TFTP

Select **Main Menu> Reset & Software Download> Software Download (TFTP)** to download the system software via the TFTP server. A message as shown below will appear for confirmation. Choose **DownLoad** by using the **Up/Down** key. After finishing the download, the application software will be updated.

```
SOFTWARE DOWNLOAD(TFTP)                  Exit

    Do you really want to download new software? Please confirm:

                        DownLoad
```

Note: you have to go to the **Main Menu>Configuration>SNMP Configuration** to enter the IP address of the TFTP server and the file name you would like to download before performing the software upgrade.

6.5.4   Remote Software Download via TFTP

The remote upgrade allows upgrading the NT device via the central LT device.
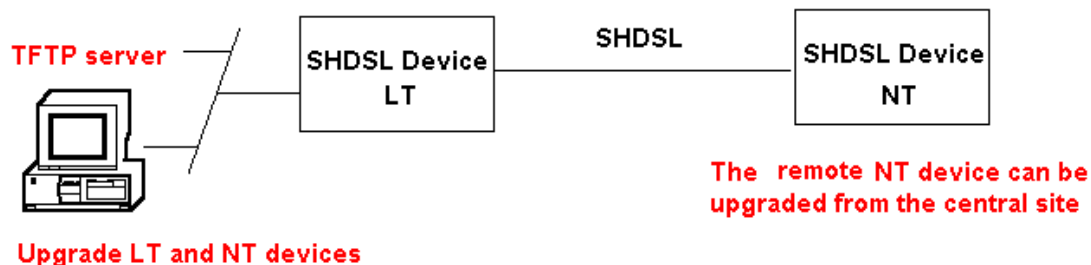
STEP 1: To upgrade the software via a TFTP server, first enter the **Main Menu>Configuration>SNMP Configuration** screen to enter the IP address of the TFTP server and the file name you would like to download.


```
SNMP CONFIGURATION                    Exit    Confirm

    Node IP Address:              172.16 .7  .37
    Node IP Subnet Mask:          255.255.0  .0
    Gateway IP:                   172.16 .7  .40

    Trap IP Address 1:            0  .0  .0  .0
    Trap IP Port 1:               162 62000 62001 62002
    Trap IP Address 2:            0  .0  .0  .0
    Trap IP Port 2:               162 62000 62001 62002

    Read  Community String:       public
    Write Community String:       private
    Trap  Community String:       alert

    File Server IP Address :      172.16 .7  .7

    Software Download Filename:            load.img
    Configuration Database Up/Download Filename: vcdb.bin

Up, Down Arrow: Field Move; Ctrl+X: Exit; Ctrl+W: Confirm            <WRITE>
```

STEP 1: Select **Main Menu> Reset & Software Download> Remote Software Download (TFTP)** to perform the system software download via the TFTP server. A message shown below will appear for confirmation. Choose **Download** by using the **Up/Down** key. After finishing the download, the application software will be updated.

```
RESET                Exit

    Do you really want to reset software? Please confirm:

                        Reset
```

Chapter 7   Troubleshooting

Event	Checking Procedure
VT100 connection failure	1. Check the RS-232 connection. 2. Check the RS-232 cable. A straight-through cable is required. 3. Check the terminal emulation program. It must be VT100-compatible. 4. Check console session parameters. The default baud rate is 38400.
Login deny	1. Password incorrect. 2. Incorrect capitalization. The password is case-sensitive.
No LED display	Check the power connection.
No Response from LAN port	1. Check network connection. 2. Check SNMP configuration.
DSL Training failure or the training period has exceeded three minutes	1. Reboot the device and retrain. 2. Check the status of the DSL LOS LED. If this LED keeps blinking for over three minutes (meaning the device cannot train), then the line quality is poor, or the link distance is too long for the device to train. Contact your service provider.

Appendix A Specifications

Specification	Criteria
Diagnostics:	
Loopback Function	DSL
Loopback Types	Local Loopback, Remote Loopback
Built-In Test Patterns	2047, PRBS ($2^{15}-1$)
DTE:	
E1 Interface	ITU-T G.703, G.704
E1 frame	Unframed, Fractional
Connector	BNC (75Ω) or RJ45 (120Ω)
Environment:	
Temperature	0–50 degrees Celsius
Humidity	5% – 95% Relative Humidity (Non-Condensing)
Management:	
Local interface	RS-232 DB9 for VT100
SNMP management	10BaseT Ethernet port, Embedded SNMP agent
Remote Management	Through EOC
Telnet Management	Yes
TFTP Software Download	Yes
Physical Dimensions	Width: 9.5 in (242 mm)
	Height: 1.7 in (44 mm)
	Depth: 6.6 in (167 mm)
Power:	
Input Voltage	110 VAC, 220 VAC, or –48 VDC
Power Consumption	7 W Max
SHDSL Line:	
Encoding scheme	TC-PAM
Medium	Single non-loaded twisted pair
Line Rate	Per ITU-T G.991.2 (G.SHDSL)
Connector	RJ45 female
Timing	E1-Loop, SHDSL-Loop, Internal

Note: Specifications are subject to change without notice.

Appendix B   Pin Assignments

■   **Console port**

Pin	Definition	Pin	Definition
1	-	6	-
2	TD	7	-
3	RD	8	-
4	-	9	-
5	GND		

Table B-1 Console Port Pin Assignments

■   **RJ45 E1 interface**

Pin	Definition	Pin	Definition
1	Rx (Ring)	2	Rx (Tip)
3	-	4	Tx (Ring)
5	Tx (Tip)	6	-
7	-	8	-

Table B-2 RJ45 E1 Interface Pin Assignments

■   **LINE port**

Pin	Definition	Pin	Definition
1	-	2	-
3	-	4	Tip
5	Ring	6	-
7	-	8	-

Table B-3 LINE Port Pin Assignments