HIGAIN ETSI

UNIVERSAL TERMINATION UNIT
QUICK INSTALLATION GUIDE

Model	List Number	Part Number
UTU-814	1B	150-1420-54B

PAIRGAIN TECHNOLOGIES, INC.
ENGINEERING SERVICES
SECTION 700-814-112-01

Revision History of This Guide

Revision	Release Date	Revisions Made
01	November 24, 1999	Initial release

USING THIS GUIDE

Three types of messages, identified by icons, appear in the text.

Notes contain information about special circumstances.

Cautions indicate the possibility of equipment damage or the possibility of personal injury.

The ESD Susceptibility symbol indicates that a device or assembly is susceptible to damage from electrostatic discharge.

DOCUMENTATION

The complete technical practice for the *HiGain ETSI Universal Termination Unit, UTU-814 List 1B*, section 700-701-100-xx, can be downloaded from the Customer Site portion of the PairGain Web page at *www.pairgain.com*. A password is required. If you do not have a password, contact your PairGain sales representative.

If you have comments on this PairGain document, send an email to technical_publications@pairgain.com. Type the product name and the section number of the document in the subject area of the email message.

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OVERVIEW

The PairGain® HiGain ETSI™ Universal Termination Unit UTU-814 List 1B is a programmable High-bit-rate Digital Subscriber Line (HDSL) unit that can be configured as an LTU (master) or an NTU (slave). These LTUs and NTUs are the Exchange Office and Customer sides, respectively, of a repeaterless, DSX-1 (T1) and Nx64k (serial interface) transmission system.

The LTU-configured UTU-814 accepts the respective payloads through DSX-1 and Nx64k ports and transports data to the NTU-configured unit at rates of up to 1.544 Mbps (the standard T1 rate). The 1.544 Mbps payload is allocated to the DSX-1 and Nx64k ports in time-slot increments of 64 kbps each.

The DSX-1 interface conforms with ANSI T1.403-1989 and AT&T CB 119 standards. The Nx64k serial data interface complies with the V.35, V.36, X.21, or RS-530 (RS-449) standard based on the selection made from the console screen menus.

The NTU-configured UTU-814 can be locally powered by -36 to -72 Vdc or line powered by a conventional LTU using less than 120 Vdc and 50 mA on each HDSL loop. The LTU-configured UTU-814 is locally powered by -36 to -72 Vdc. The UTU-814 does not supply power to other HDSL units.

Supported application modes include Unstructured, Structured, Time Slot Prioritization (TSP), and Single (single pair).

Point-to-multipoint, doubler, and protection switching applications are not supported.

FEATURES

The UTU-814 List 1B has the following features:

- Application as both DSX-1 and Nx64k HDSL systems.
- Framing insertion for transmission of unframed data into T1 networks.
- Detection of standard CSU loop-up/loop-down codes.

TRANSMISSION RANGES

The UTU-814 List 1B has a transmission range of up to 3.66 km (12,000 ft.) when using 0.51 mm (24 AWG) wire and 2.74 km (9,000 ft.) when using 0.4 mm (26 AWG) wire, including bridged taps.

COMPATIBILITY

The UTU-814 List 1B is compatible with the following PairGain HiGain ETSI shelves and enclosures.

- EMS-830 Exchange Office Management Shelf, rear connector access (part number 150-1400-01).
- EMS-831 Exchange Office Management Shelf, front connector access (part number 150-1401-01).
- EMS-832 Exchange Office Management Shelf, front connector access (part number 150-1402-01).
- ERE-810 Single-Slot Remote Enclosure (part number 150-1410-01).
- ERE-811 Single-Slot Remote Enclosure with internal AC power supply (part number 150-1411-0x).
- ERE-821 Dual-Slot Remote Enclosure with internal AC power supply (part number 150-1416-01).
- ERE-826 Single-Slot Remote Enclosure (part number 150-1412-01).

FRONT PANEL

The components on the UTU-814 List 1B front panel are shown in Figure 1. Their functions are described in Table 1 on page 4 and Table 2 page 5.

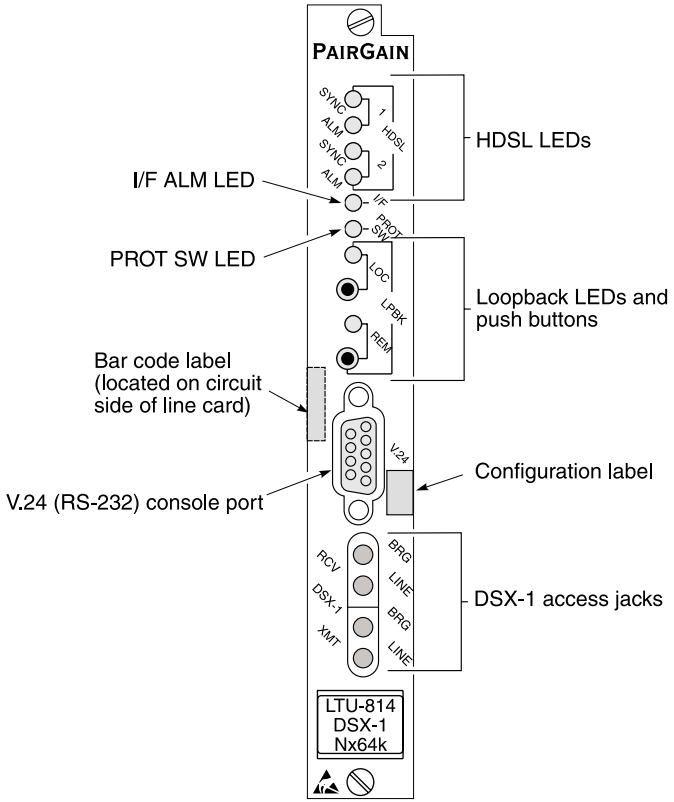

Figure 1. *UTU-814 List 1B Front Panel*

Table 1. *UTU-814 List 1B Front Panel Components*

Item	Function
HDSL Loop 1 SYNC LED	Displays synchronization state for HDSL Loop 1.
HDSL Loop 2 SYNC LED	Displays synchronization state for HDSL Loop 2.
HDSL Loop 1 ALM LED	Displays alarm state for HDSL Loop 1.
HDSL Loop 2 ALM LED	Displays alarm state for HDSL Loop 2.
I/F ALM LED	Displays alarm state for the DSX-1 and Nx64k ports.
PROT SW LED	Not supported.
LOC LPBK LED	Displays local (LOC) loopback state.
LOC LPBK button	Activates the local HDSL analog loopback (V.54 loop 3).
REM LPBK LED	Displays remote (REM) loopback state.
REM LPBK button	Activates the remote interface loopback (V.54 loop 2).
V.24 (RS-232) console port	Provides bi-directional communication between the unit and an external maintenance terminal through a V.24 (RS-232C) interface to allow configuration and performance monitoring through the console screen menus as described in "System Configuration" on page 9.
DSX-1 access jacks	
LINE	Provides splitting jack access to (XMT) and from (RCV) at the DSX-1 interface. Breaks the XMT and RCV paths to permit test signal insertion and retrieval.
BRG	Provides non-intrusive bridging jack access to (XMT) and (RCV) at the DSX-1 interface. Allows the two T1 payloads to be monitored.
Bar code label	Contains the serial number and part number of the line card, as indicated in both bar code and text format. Also contains the configuration number of the line card, as indicated by "CFG: R*nn,*" where *nn* is the configuration number. For example, CFG: R07 would indicate line card configuration number 07.
Configuration label	Contains the configuration number of the line card, as indicated by R*nn,*" where *nn* is the configuration number. For example, R07 would indicate configuration number 07.

For information on loopback testing and loopback LED indications, see the *Line and Network Termination Units* technical practice, section 700-804-100-xx.

Table 2. *Front Panel LED Indications*

LED	Mode	Description
HDSL Loop 1 SYNC HDSL Loop 2 SYNC	Steady green	HDSL Loop is ready to transmit and receive data across all spans.
	Slow blinking	HDSL Loop acquisition is in progress for local span.
	Off	HDSL Loop is not configured.
HDSL Loop 1 ALM HDSL Loop 2 ALM	Steady red	Loss of sync word (LOSW); margin below threshold (MAR); or errored second count (ES) above threshold.
	Pulsing red	Pulses for every ES on any span.
	Off	Normal transmit or receive data is in progress.
I/F ALM	Blinking red	Loss of clock (LOC); receive alarm indication signal (RAIS); or loss of frame alignment (LFA).
	Steady red	Loss of clock (LOC) or DSX-1 signal.
PROT SW	Not supported.	

INSPECTION

Before installing the equipment, inspect it for signs of shipping damage. If the equipment has been damaged in transit, immediately report the extent of the damage to the transportation company and to PairGain Technologies.

SAFETY

To ensure your safety when servicing and installing this equipment, please take the following precautions:

Be careful when installing or modifying telephone lines. Dangerous voltages can be present. It is unsafe to install telephone wiring during a lightning storm.

Always disconnect all telephone lines and power connections before servicing or disassembling this equipment. For performance and safety reasons, only power supplies listed for use with telephone equipment by a locally recognized organization should be used with PairGain equipment. All wiring external to the product should follow the local wiring codes.

INSTALLATION

Proceed as follows to install the UTU-814 into a shelf or remote enclosure.

The chassis ground of the shelf or remote enclosure receiving these units must be connected to earth ground for protection of the equipment and for safety of personnel.

Other protection is required when the network side of the equipment is extended to an outside facility.

This product uses static sensitive components. Be sure to wear an antistatic wrist strap connected to the chassis ground when performing the installation procedures.

1 Install the UTU-814 into the appropriate slot (1 through 16) of a shelf or into a single- or dual-slot remote enclosure. (See "Compatibility" on page 2.)

2 Connect the power source as instructed in the technical practice for the shelf or remote enclosure in which the line unit is installed.

3 Connect the data and HDSL line cabling as instructed in the technical practice for the shelf or remote enclosure in which the units are installed.

4 Set the DTE to the correct data rate (or keep the DTE disconnected).

HDSL STARTUP AND SYNCHRONIZATION

Power up the shelf or enclosure where the UTU-814s are installed and observe the following:

1 The HDSL SYNC LEDs should flash once per second as the units attempt to establish synchronization.

Each unit performs a brief power-up self test. During the test, the front-panel LED indicators flash in an incremental binary sequence to indicate the test in progress. If the LEDs stop incrementing, the unit has failed the self-test. If this happens, note the final LED display pattern and contact PairGain customer service at +714.832.9922 for assistance.

2 After approximately 30 seconds, confirm one of the following:

- The two HDSL SYNC LEDs are not blinking and the HDSL ALM LEDs are off, indicating the units are synchronized and ready to transmit and receive data. The units can now be configured through the console screen menus.
- One or both of the HDSL SYNC LEDs continue to blink after approximately one minute. This indicates that the HDSL pair that corresponds to the LED is experiencing an excessive signal loss or is in an open condition. Check the line and repair if necessary.

An LTU holds the configuration settings for both itself and the remote NTU. After the two units establish synchronization, the LTU checks if the remote NTU is the same type (that is, the same model number). If the NTU type is the same, the LTU configures the NTU to the settings held by the LTU. If the NTU type is different, the LTU configures the NTU to its factory default settings.

SYSTEM CONFIGURATION

After establishing communication with the remote unit, the HDSL system can be configured and performance can be monitored from the local unit. If the HDSL link is down, the only parameters that can be changed are those on the local unit. The LTU provides a special lockout feature that prevents users connected to the NTU console port from changing the circuit configuration. When enabled, this feature provides the maintenance terminal connected to an NTU with a read-only view of the HDSL system.

The console screen menus are not available when the HDSL line unit is under the control of a shelf management unit.

MAINTENANCE TERMINAL CONNECTION

A maintenance terminal is used to access the line unit console screen menus. Through these menus, the HDSL system is configured, monitored, tested, and its circuit inventory is displayed.

To connect a maintenance terminal:

1 Connect a standard serial cable from the maintenance terminal COM port to the line unit's front panel console port. The pinouts for the console port and maintenance terminal connectors are shown in Figure 2 on page 10.

2 Configure the maintenance terminal for the following communication settings:

- VT100 Emulation or ANSI (if VT100 is not available)
- Clear the modem initialization string if supported by the terminal
- Bits per second: 1200, 2400, 4800, 9600 (default), or 19200 bps (recommended)
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow Control: None

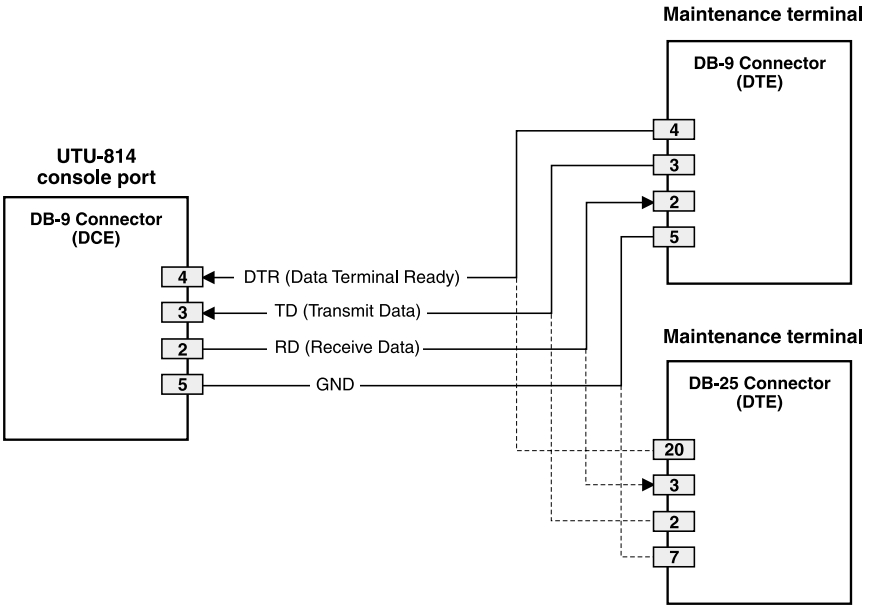

Figure 2. *UTU-814 Console Port and Maintenance Terminal Connector Pinouts*

LOGGING ON

To log on to the maintenance terminal console screen:

1 Press the **SPACEBAR** several times to activate the autobaud feature and to display the Logon Password screen.

The ENTER key is the factory default password. If you establish a different password, you must type the new password (single word, no spaces, up to eight characters) on a subsequent log on. If the system does not respond, verify that the Hardware Flow Control of the maintenance terminal is set to NONE.

2 Type the password at the prompt or press **ENTER** if a password has not been established. The console screen's menu bar displays.

NAVIGATING MENUS

Use the keys described in Table 3 to navigate the console screen and its menus.

Table 3. *Console Screen Navigation Keys*

These Keys	Perform this Function
Alpha-numeric keys	Type the underlined or highlighted letter to select and execute a menu item. For example on the console screen menu bar, type C to access the *Config* drop-down menu. Also use these keys to enter values in text fields. For example, on the *Config Date and Time* menu, type the date in a DD/MM/YY format.
↑ and ↓ keys	Press the ↓ key to access a console screen drop-down menu. For example, press the ↓ key on *Config* to access the *Config* drop-down menu. Or press the ↑ and ↓ keys to highlight a sub-menu item, then press ENTER to select the item. For example, press the ↓ key to highlight *Config Alarms*, then press ENTER to view the sub-menu.
TAB key	Provides same function as the ↓ key.
← and → keys	Moves horizontally across the Menu bar, except when in a text entry field.
CTRL + E and CTRL + X	CTRL + E moves up one line and CTRL + X moves down one line on the History screens.
CTRL + C and CTRL + R	CTRL + C performs page-down and CTRL + R performs page-up functions on the History screens.
SPACEBAR	Toggles among options displayed for current menu item. For example, to select the Application mode from the *Config System Settings* menu: • Press the ↓ key to highlight the Application mode option, then • Press the SPACEBAR until the desired option (UNSTRUCT, STRUCT, TSP, SINGLE) is highlighted and press ENTER to confirm the selection.
ESC	Exits the current screen and returns to the previous screen. Selections made on the current screen are discarded. Pressing ESC in a text field cancels the text entry and restores the old value.
ENTER	Applies all selections on the current screen. Press ENTER twice for numeric changes to take effect. When editing a text field, however, the first ENTER terminates editing and a second ENTER applies any changes.

CONSOLE SCREEN MENU STRUCTURE

The Console screen displays a row of drop-down menus that serve as a guide to the appropriate option or screen. Figure 3 shows the structure of the Console screen menus. Each menu is identified by name in the menu bar (Monitor, History, Config, etc.). The “Display” and “Displays” designation indicates that the menu or sub-menu shows one or more screens.

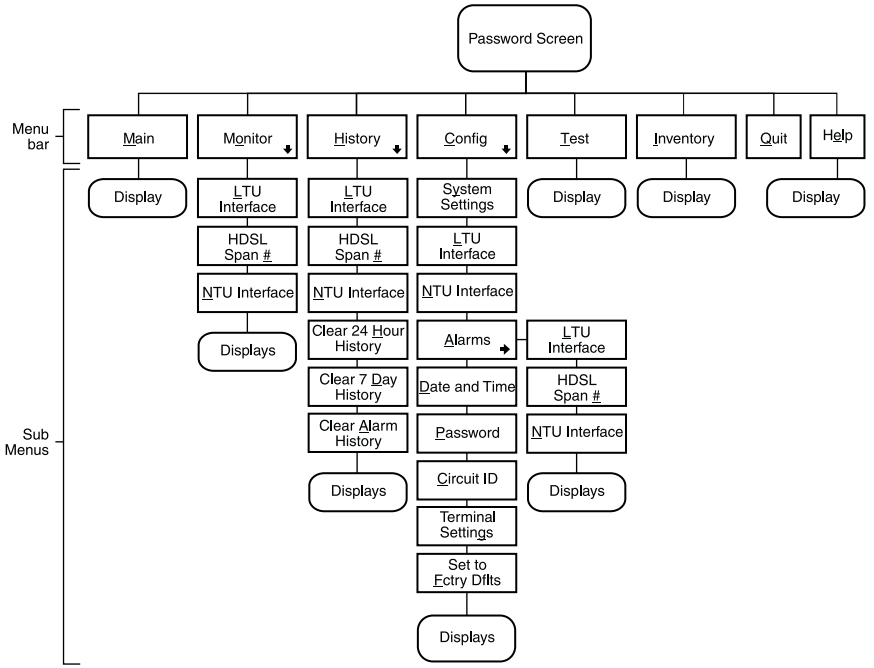

Figure 3. *Console Screen Menu Structure*

SYSTEM SETTINGS

The settings available in the *Config System Settings* menu are listed in Table 4.

Table 4. *Settings in Config System Settings Menu*

System Setting	Description (settings in boldface type are default settings)
Application mode	Select one of the following application modes:
UNSTRUCT	System operates in the unstructured application mode using 24 time slots. Use when LTU and NTU use either the DSX-1 or Nx64k port with no framing. Two-port (DSX-1 and Nx64k) operation is not possible.
STRUCT	System operates in the structured application mode using 24 time slots. Use to transport framed voice channels between the LTU and NTU DSX-1 ports and serial data between the Nx64k ports.
TSP	System operates in time slot prioritization mode. Time slots 1 through 12 transport high priority traffic over Loop 1; time slots 13 through 24 transport low priority traffic over Loop 1. The NTU must be locally powered. Remote Power Feed must be set to NONE.
SINGLE	System operates in single-pair mode using time slots 1 through 12 on Loop 1. Use to transport framed voice channels between the LTU and NTU DSX-1 ports or serial data between the Nx64k ports. The NTU must be locally powered. Remote Power Feed must be set to NONE.
Remote Power Feed mode	Select one of the following power feed modes:
NONE	Disables the remote power feed mode. The NTU must be locally powered. Used for TSP and SINGLE application modes.
POWER	LTU supplies full power to the NTU through both loops.
WETTING	LTU supplies a low level DC current to prevent corrosion of HDSL lines and connections. The NTU must be locally powered.

Table 4. *Settings in Config System Settings Menu (Cont.)*

System Setting	Description (settings in boldface type are default settings)
Remote Power Feed Loop	No selection available.
BOTH	BOTH is displayed in UNSTRUCT, STRUCT, and TSP application modes. The LTU uses Loop 1 and Loop 2 to supply power to the NTU.
LOOP1	LOOP1 displays in SINGLE application mode when POWER is selected for Remote Power Feed mode. This is followed by the warning `NTU LOCAL POWER REQUIRED, PROCEED ANYWAY (Y/N).`
Remote Console Access	Select whether system settings can be made from the NTU console screen or the settings are read-only. This option is set only at the LTU.
ALLOWED	NTU console screens can be used to make system settings.
BLOCKED	NTU console screens are read-only. The LOC and REM pushbuttons on the NTU are also disabled. System settings can be made only from the LTU console screen.
Protection Switch Command	Not supported.
Local Unit Role (LTU or NTU)	Configures the UTU-814 as LTU (master) or NTU (slave). The default configuration is NTU (slave). Note that changing the Local Unit Role of the UTU-814 causes the unit to reset and the LEDs to cycle.
LTU	Configures the UTU-814 as LTU (master). The LTU-configured UTU-814 does not provide line power to other HDSL units.
NTU	Configures the UTU-814 as NTU (slave). The NTU-configured UTU-814 cannot receive power from another UTU; it can, however, receive power from a conventional LTU.

LTU AND NTU INTERFACE SETTINGS

The settings available in the *Config LTU* and *Config NTU Interface* menus are listed in Table 5.

Table 5. *Settings in Config LTU and Config NTU Interface Menus*

Field	Description (settings in boldface type are default settings)
	DSX-1 Port
Primary Timing Source:	Select the clock source for the HDSL transmit direction. If any time slots are assigned to DSX-1, then the only options are DSX-1 or EXT for both the DSX-1 and Nx64k ports.
EXT	External 1.544 MHz clock.
DSX-1	Timing recovered from the T1 input.
Framing Mode	Select the framing mode used by your equipment.
D4-SF	Provides 12 frames of 24 time slots per superframe.
ESF	Provides 24 frames of 24 time slots per superframe.
N/A	Unit is in unstructured (UNSTRUCT) application mode.
Idle Code	Select a transmit idle code for insertion into unused time slots.
00 to **FF**	Idle code (from 00 to FF) is transmitted in unused time slots from DSX-1 port. Factory default setting is FF.
Data Rate/# of TSs	Specify the DSX-1 transmit data rate as the number of kbps or the number of Nx64k time slots.
64 to **1536** (kbps)	Enter the data rate from 64 to 1536 kbps (for example, 64, 256, 768). Factory default setting is 1536 kbps (24 time slots).
0 to **24** (time slots)	Enter the number of Nx64k time slots up to 24 (for example, 1, 12, 24). Factory default setting is 24 (1536 kbps).
Beginning TS	Enter the number of the beginning time slot for the transmitted T1 data. Options are time slots 1 to 24 in STRUCT application mode and time slot 1 in UNSTRUCT mode. The factory default setting is time slot **1**.

The number of time slots selected for the DSX-1 port determines the number of time slots remaining for the Nx64k port, and may determine the beginning time slot for the Nx64k port.

Table 5. *Settings in Config LTU and Config NTU Interface Menus (Cont.)*

Field	Description (settings in boldface type are default settings)
AIS Mode	Specify the mode used to assert an Alarm Indication Signal (AIS). Used in Structured mode.
FULL	The full AIS mode asserts the AIS when one loop is down.
HALF	The half AIS mode asserts the AIS when both loops are down.
Line Equalization	Select the line equalization according to the distance from the DSX-1 cross connect to the UTU-814.
0	Sets the line equalization for 0 to 133 feet.
133	Sets the line equalization for 133 to 266 feet.
266	Sets the line equalization for 266 to 399 feet.
399	Sets the line equalization for 399 to 533 feet.
533	Sets the line equalization for 533 to 655 feet.
P68	Sets the line equalization for use with a Channel Service Unit (CSU) on customer premises.
Insert Framing	Enable or disable framing insertion. Use where data requires insertion of D4-SF or ESF framing for transmission over T1 network.
DIS	Disables framing insertion.
ENA	Enables framing insertion.
Line Code	Select Bipolar Eight-Zero Suppression (B8ZS) or Alternate Mark Inversion (AMI) line coding.
B8ZS	Outgoing streams of eight consecutive zeros are replaced with B8ZS code words. Received B8ZS words are placed with all zeros.
AMI	Binary ones (marks) are transmitted as alternating positive and negative pulses and zeros have an absence of pulses.
	Nx64k Port
Primary Timing Source:	Select the clock source for the HDSL transmit direction. If any time slots are assigned to DSX-1, then the only options are DSX-1 or EXT for both the DSX-1 and Nx64k ports.
INT	Internal Oscillator
Nx64k	Nx64k Serial Data port receive clock (TT)
HDSL	Timing recovered from the HDSL input.
EXT	External 1.544 MHz clock

Table 5. *Settings in Config LTU and Config NTU Interface Menus (Cont.)*

Field	**Description (settings in boldface type are default settings)**
Interface Type	Select the interface standard for Nx64k serial data port. The options are: V.35, **V.36**, X.21, and RS-530.
Data Rate/# of TSs	Specify the Nx64k transmit data rate as the number of kbps or the number of Nx64k time slots.
64 to **1536** (kbps)	Enter the data rate from 64 to 1536 kbps (for example, 64, 256, 768). Factory default setting is 1536 kbps (24 time slots).
0 to **24** (time slots)	Enter the number of Nx64k time slots up to 24 (for example, 1,12, 24). Factory default setting is 24 (1536 kbps).
Beginning TS	Enter the number of the beginning time slot for the transmitted serial data. Options are time slots 1 to 24 in STRUCT application mode and time slot 1 in UNSTRUCT mode. The factory default setting is time slot **1**.
Transmit Clock	Specify the transmit data (SD) clock as External (EXT), Internal Rising Edge (**INT_RISING**), or Internal Falling Edge (INT_FALLING).
CTS/DSR/RLSD	Specify one of three methods the LTU and NTU uses to generate the CTS, DSR, and RLSD control signals for the Nx64k serial data port. The Nx64k port is hardware configured as DCE. Set each of these parameters to match the requirements of the application. The choices are:
STD (standard)	The output control signal follows the ITU standards.
ON (force ON)	Control signal is always ON.
OFF (force OFF)	Control signal is always OFF.
LL/RL	Select whether the LTU and NTU responds to or ignores the Local Loopback (LL) and Remote Loopback (RL) control signals.
DIS	The LTU and NTU ignores LL and RL control signals.
ENA	The LTU and NTU responds to LL and RL control signals. Status of local and remote loopbacks appears on the Test display.

VIEWING STATUS

View status using a maintenance terminal or PC running a terminal emulation program connected to the line unit's V.24 (RS-232) console port.

MAIN CONSOLE SCREEN

The main console screen displays a summary of LTU and NTU circuit configuration, as well as performance statistics and alarm status for each interface. Table 6 lists the information displayed in each field of the main console screen.

Table 6. *Information Displayed in Main Console Screen*

Field	Description
	Circuit Configuration
DSX-1	Identifies the LTU and NTU DSX-1 port.
n TS	Indicates the number of T1 time slots (*n*) selected for the DSX-1 application interface.
Nx64k	Identifies the LTU and NTU Nx64k serial data port.
n k	Indicates the data rate selected for the Nx64k application interface.
RPF/WETTING	Indicates RPF (POWER) or WETTING mode for Remote Power Feed. Nothing is shown when NONE is selected.
Timing	Indicates the clock source for the HDSL transmit direction.
EXT	External 1.544 MHz clock.
DSX-1	Clock extracted from T1 data stream.
Framing	Indicates the Framing Mode selected for the DSX-1 port.
D4-SF	Superframe contains 12 frames with 24 time slots per frame.
ESF	Superframe contains 24 frames with 24 time slots per frame.
Application Mode	Indicates application mode selected.
STRUCT	Structured with framing.
UNSTRUCT	Unstructured, no framing.
TSP	Time slot prioritization with framing.
SINGLE	Single pair with framing.

Table 6. *Information Displayed in Main Console Screen (Cont.)*

Field	Description
	Performance
MAR1	Displays the Margin value for the HDSL Loop 1 interface at the LTU and NTU or displays link status (SIG, ACK, etc.) if the link is not up.
MAR2	Displays the Margin value for the HDSL Loop 2 interface at the LTU and NTU or displays link status (SIG, ACK, etc.) if the link is not up.
ES1	Displays the errored second counts for the LTU and NTU DSX-1 ports and the HDSL Loop 1 interface at the LTU and NTU. The counts are for the latest 24-hour period, including the current 15-minute interval.
ES2	Displays the errored second counts for the LTU and NTU Nx64k ports and the HDSL Loop 2 interface at the LTU and NTU. ES2 is calculated the same as for ES1.
	Alarms
The Alarms field displays a list of all active alarms at the LTU and NTU interface and the HDSL Span 1 interface.	
Possible LTU and NTU Interface alarms:	
LOS	Loss of signal at the DSX-1 or Nx64k input.
LFA	Loss of frame alignment at the DSX-1 input (structured mode only).
AIS	Alarm Indication Signal (unframed all ones) received at the DSX-1 input.
RAI	Remote Alarm Indication Signal received at the DSX-1 input (structured mode only).
LOC	Loss of clock when EXT timing is used. The external clock was lost for the previous second. This alarm is reset when the clock is active again.
Possible HDSL Span 1 alarms:	
MAR	Margin has fallen below alarm threshold for one or both loops of HDSL Span 1.
ES	Errored second count has exceeded alarm threshold for one or both loops of HDSL Span 1.
LOSW	Loss of sync word for one or both loops of HDSL Span 1. Remains active during restart, but not a cold start.
PFO	Power feed open for one or both loops of HDSL Span 1. Remains active until power is successfully fed to remote unit, or remote power feeding is disabled.
PFS	Power feed short for one or both loops of HDSL Span 1. Remains active until power is successfully fed to remote unit, or remote power feeding is disabled.
NOPSW	Protection circuit (backup) is not available.

MONITOR SCREENS

The Monitor screens display the signal activity at the LTU and NTU DSX-1 and Nx64k ports, and the 24-hour error counts and other information from the HDSL Span 1interface.

Monitor LTU and NTU Interface Screens

Table 7 lists the information displayed in each field of the *Monitor LTU* and *Monitor NTU Interface* screens.

Table 7. *Information in Monitor LTU and NTU Interface Screens*

Field	Description
	DSX-1 Port
Errored Seconds (ES) 24 Hour Count	The number of one-second intervals in which at least one bipolar violation (BPV) or one CRC-6 error was detected at the DSX-1 input port during the last 24hours.
Severely Errored Seconds (SES) 24 Hour Count	The number of one-second intervals during which a Loss of Signal (LOS), an Alarm Indication Signal (AIS), or a Loss of Frame (or CRC-6 Multiframe) Alignment (LFA) occurred at the incoming port.
Unavailable Seconds (UAS) 24 Hour Count	The number of seconds that DSX-1 input signals were unavailable during the last 24 hours. After ten consecutive SESs, the system is deemed unavailable, and the current UAS counter begins counting from ten. After ten consecutive non-SESs, the system returns to availability, and the ten counts representing the non-SESs are removed from the UAS counter.
Bipolar Violation Seconds (Cumulative)	The number of seconds in which bipolar violations were detected at the DSX-1 port since error counters were last cleared.

Table 7. *Information in Monitor LTU and NTU Interface Screens (Cont.)*

Field	Description
	Nx64k Port
Data & Clk Activity	Displays the status of the data and clock signals at the Nx64k port at one-second intervals Asterisks (**) indicate an active line. Dashes (--) indicate an inactive line. Displayed fields are: From DTE: TT SD From DCE: ST RT RD
Ctrl Signal State	Displays the status of the control signals at the Nx64k port at one-second intervals. ON indicates an active line. OFF indicates an inactive line. Displayed fields are: From DTE: RTS DTR RL LL From DCE: CTS DSR RLSD TM
Clear 24Hour History	The date and time that the 24-hour histories were last cleared are displayed here. Enable this function by pressing L or ENTER to clear all 24-hour history counters (including HDSL). This action must be confirmed by pressing Y.

Monitor HDSL Span Screens

Table 8 lists the information displayed in the *Monitor HDSL Span 1* screen for Loop 1 (LTU-1/NTU-1) and Loop 2 (LTU-1/NTU-1).

Table 8. *Information Displayed in Monitor HDSL Span 1 Screen*

Field	Description
Current Margin (dB) (MAR)	Indicates the excess signal-to-noise ratio relative to a 10^{-7} bit error rate. The normal range of a typical margin is from 6 to 22 dB, with a value of 6 dB corresponding to a predicted BER of 10^{-10}.
Low Margin (dB)	Indicates the lowest margin since startup or since the last time the 24-hour history was cleared.
High Margin (dB)	Indicates the highest margin since startup or since the last time the 24-hour history was cleared.
Pulse Attenuation (dB)	Indicates the attenuation of the 2B1Q pulse from the distant end. This value is related to the cable pair's loss at 292 KHz. The normal range of pulse attenuation is from 1 to 32 dB.
Errored Seconds (ES)	The number of one-second intervals in which at least one HDSL CRC-6 error or loss of Sync Word (LOSW) was detected on the HDSL span during the last 24 hours.
Unavailable Seconds (UAS)	The number of seconds that the HDSL span was down during the last 24 hours.
Pair Exchange	Indicates whether the HDSL pairs carrying the traffic are correctly connected or have been interchanged. The system automatically compensates for an interchange of pairs.
Loop 1 Tip/Ring Reversal	Indicates whether the two conductors of HDSL Loop 1 are correctly connected or have been interchanged. The system automatically compensates for an interchange of wire leads.
Loop 2 Tip/Ring Reversal	Indicates whether the two conductors of HDSL Loop 2 are correctly connected or have been interchanged by error. The system automatically compensates for an interchange of wire leads.
Clear 24 Hour History	Clears all 24-hour history counters (including DSX-1 values) and displays the date and time the error counters were last cleared.

PAIRGAIN REGIONAL SALES OFFICES

Customer assistance, sales, and product information is available at PairGain's regional sales offices. Contact the PairGain regional sales office at the location serving your area.

Table 9. *PairGain Regional Sales Offices*

Region	Location	Hours	Telephone Number	Fax Number
United States and Canada	Tustin, California USA	24-hours-a-day, 7-days-a-week	+714.832.9922	+714.832.9908
Latin America	Miami Beach, Florida USA	Monday - Friday, 9:00AM to 5:00PM	+305.957.8100	+305.949.5804
	Campinas, Brasil	Monday - Friday, 8:00AM to 5:00PM	+55.19.865.9205	+55.19.865.9202
Europe	Switzerland	Monday - Friday, 8:00AM to 5:30PM	+41.56.483.4400	+41.56.483.4401
	United Kingdom	Monday - Friday, 8:00AM to 5:00PM	+44.1256.698054	+44.1256.698254
Middle East and Africa	Dubai, U.A.E.	Sunday - Thursday, 9:00AM to 6:00PM	+971.4.343.4949	+971.4.343.0656
Asia Pacific and China	Hong Kong (N.E. Asia)	Monday - Friday 9:00AM to 5:00PM	+852.2802.2918	+852.2802.2789
	Beijing (N. China)	Monday - Friday 8:30AM to 5:00PM	+86.10.6847.6856	+86.10.6847.6857
	Guangzhou (S. China)	Monday - Friday 8:30AM to 5:00PM	+86.20.8387.7153	+86.20.8387.3011

ORDERING PROCEDURE

Orders may be placed through PairGain regional sales offices by telephone, fax or, mail. A fax is preferred.

When placing an order, please provide the following information:

- Customer purchase order number
- Ship-to and bill-to addresses
- Part numbers and quantity required
- Requested delivery date
- Preferred method of shipment.

After receiving your order, PairGain will send an Order Acknowledgment to the bill-to and ship-to addresses (unless directed otherwise).

PRODUCT SUPPORT

PairGain Customer Service Group provides expert pre-sales and post-sales support and training for all its products.

TECHNICAL SUPPORT

Technical assistance is available 24 hours a day, 7 days a week by contacting PairGain Customer Service Group at:

Telephone:	800.638.0031 or 714.832.9922 The 800 telephone support line is toll-free in the U.S. and Canada.
Fax:	714.832.9924
Email:	support@pairgain.com

During normal business hours (7:30 AM to 5:30 PM, Pacific Time, Monday through Friday, excluding holidays), technical assistance calls are normally answered directly by a Customer Service Engineer. At other times, a request for technical assistance is handled by an on-duty Customer Service Engineer through a callback process. This process normally results in a callback within 30 minutes of initiating the request.

WORLD WIDE WEB

Product manuals, firmware updates, and SNMP Management Information Bases (MIBs) for HiGain ETSI products can be downloaded from the Customer Site portion of the PairGain Web site at *http://www.pairgain.com*. A password is required. If you do not have a password, contact your PairGain sales representative.

From the PairGain Web site, select **Customer Site** and either **Technical Manuals** to download manuals or **Firmware Updates** to download firmware. Enter your user name and password, then select the manual or type of firmware you wish to download.

RETURNS

To return equipment to PairGain:

1 Locate the number of the purchase order under which the equipment was purchased. You will need to provide this number to PairGain's Sales Administration, RMA Department, to obtain a return authorization.

2 Call or write PairGain's Sales Administration, RMA Department, to ask for a Return Material Authorization (RMA) number and any additional instructions. Use the telephone number, fax number or email address, listed below:

- Telephone: 800.370.9670
- Fax: 714.832.9923
- Email Address: rma@pairgain.com

3 Include the following information, in writing, along with the equipment you are returning:

- Company name, address, the name of a person PairGain can contact regarding this equipment, and a phone number.
- The purchase order number provided to the RMA Department when the RMA number was requested.
- A description of the equipment, as well as the number of units that you are returning. Be sure to include the model and part number of each unit.
- The shipping address to which PairGain should return the repaired equipment.
- The reason for the return:
  - The equipment needs an ECO/ECN upgrade.
  - The equipment is defective.

If the equipment is defective, please tell us what you observed just before the equipment malfunctioned. Be as detailed in your description as possible.

- If there is another reason for returning the equipment, please let us know so we can determine how best to help you.

4 Pack the equipment in a shipping carton.

5 Write PairGain's address and the Return Material Authorization (RMA) Number you received from the RMA Department clearly on the outside of the carton and return to:

PairGain Technologies, Inc.
14352 Franklin Ave.
Tustin, CA 92780-7013

Attention: **RMA (Number)**

All shipments are to be returned prepaid. PairGain will not accept any collect shipments.

CERTIFICATION AND WARRANTY

FCC CERTIFICATION

The UTU-814 List 1B has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

LIMITED WARRANTY

PairGain Technologies warrants this product to be free of defects and to be fully functional for a period of 60 months from the date of original shipment, given correct customer installation and regular maintenance. PairGain will repair or replace at PairGain's option any unit without cost during this period if the unit is found to be defective for any reason other than abuse or incorrect use or installation.

Do not try to repair the unit. If it fails, replace it with another unit and return the faulty unit to PairGain for repair. Any modifications of the unit by anyone other than an authorized PairGain representative voids the warranty.

If a unit needs repair, call PairGain for a Return Material Authorization (RMA) number and return the defective unit, freight prepaid, along with a brief description of the problem (see page 25).

PairGain continues to repair faulty modules beyond the warranty program at a nominal charge. Contact your PairGain sales representative for details and pricing.

MODIFICATIONS

Any changes or modifications made to this device that are not expressly approved by PairGain Technologies, Inc. voids the user's warranty.

All wiring external to the products should follow the provisions of the current edition of the National Electrical Code.

STANDARDS COMPLIANCE

The UTU-814 List 1B has been tested and verified to comply with the applicable sections of the following standards.

- Binational standard, UL-1459/CSA-C22.2 No. 950-95: Safety of Information Technology Equipment

Corporate Office
14402 Franklin Avenue
Tustin, CA 92780
Tel: 714.832.9922
Fax: 714.832.9924

For Technical Assistance:
800.638.0031

ISO 9001
DNV
DNV Certification, Inc.
Certificated Firm

PAIRGAIN