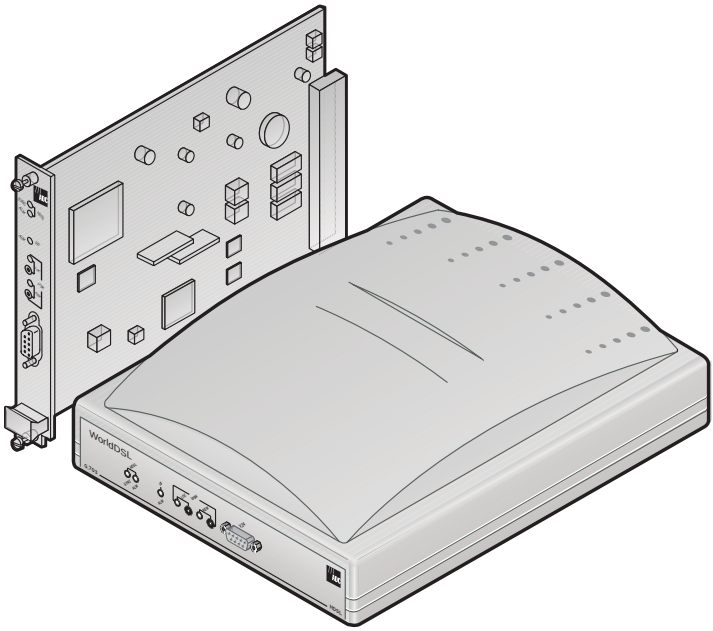
WorldDSL

QUICK INSTALLATION GUIDE

UTU-701C List 1
Rate Selectable Line Unit
Part Number: 150-1422-01C

ETU-751C List 1
Rate Selectable Desktop Unit
Part Number: 150-1432-01C



ADC

Revision History of This Guide

To order copies of this document, use document number 700-701-900-02, Revision 02.

Revision	Release Date	Revisions Made
1	January 14, 2000	Initial release
2	June 5, 2002	ADC rebranding

USING THIS GUIDE

The following conventions are used in this guide:

- `Monospace type` indicates screen text.
- Keys you press are indicated by small icons such as Y or ENTER. Key combinations to be pressed simultaneously are indicated with a plus sign as follows: CTRL + ESC.
- Items you select are in **bold**.

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

Notes contain information about special circumstances.

Cautions indicate the possibility of personal injury or equipment damage.

Warnungszeichen deuten darauf hin, dass Schaden am Gerät oder eine mögliche Körperverletzung riskiert wird, falls die Warnungen nicht beachtet werden.

The Electrostatic Discharge (ESD) symbol indicates that a device or assembly is susceptible to damage from electrostatic discharge.

UNPACK AND INSPECT YOUR SHIPMENT

Upon receipt of the equipment:

- Unpack each container and inspect the contents for signs of damage. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company and to ADC DSL Systems, Inc. Order replacement equipment, if necessary.
- Check the packing list to ensure complete and accurate shipment of each listed item. If the shipment is short or irregular, contact ADC DSL Systems, Inc. as described in "Product Support" on page 23. If you must store the equipment for a prolonged period, store the equipment in its original container.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

OVERVIEW

This guide contains installation information for the ADC WorldDSL™ RS UTU-701C List 1 and ETU-751C List 1 Rate Selectable HDSL line and desktop units.

RATE SELECTABLE HDSL

WorldDSL RS (rate selectable) is a single pair High-bit-rate Digital Subscriber Line (HDSL) solution that offers extended reach capabilities through the use of industry-leading multi-rate DSL technology. The UTU-701C and ETU-751C deploy HDSL in networks using a single pair of copper wires running at speeds between 256 kbps and 2048 kbps. The HDSL payload rates are menu selected in time slot increments of 64 kbps, ranging from 64 kbps to 2048 kbps. Transmission ranges vary according to the rate selected. Depending on noise environment, ranges of up to 7.1 km (4.4 miles) are possible at the lowest-selectable HDSL payload rates (256 kbps), using 0.51 mm wire. Longer ranges are possible with larger wire.

Use of this product in a manner other than defined in this installation guide may cause damage to equipment or injury to personnel.

Falls der Gebrauch von diesem Produkt nicht gemaess der Definition im Installations Handbuch eingehalten wird, besteht die Gefahr, dass Schaden am Geraet oder sogar Koerperverletzungen entstehen koennten.

WorldDSL RS units are not backward compatible with standard HDSL or management unit firmware. The installed firmware must be that designed for rate selectable units.

UTU-701C LINE UNIT

The UTU-701C can be configured as a Line Termination Unit (LTU) or Network Termination Unit (NTU). The default configuration is NTU.

When configured as an LTU, the UTU-701C serves as the Exchange Office side of a repeaterless, HDSL transmission system. The LTU-configured unit connects to an NTU-configured unit (UTU-701C or ETU-751C) over one twisted-pair of copper wires, completing the HDSL transmission system.

The UTU-701C accepts the DTE payload at its G.703 port and transports the data to the remote unit at the selected HDSL rate. The UTU-701C requires -36 to -72 Vdc from a local power supply or an enclosure's AC-to-DC power supply; it does not supply power to other HDSL units.

ETU-751C DESKTOP UNIT

The ETU-751C is housed in a plastic enclosure with interface and power connectors for use as an integrated desktop unit. All functions of the ETU-751C, with exception of power requirements, are identical to the UTU-701C. The ETU-751C requires a source of 100 to 240 Vac at 50 or 60 Hz.

TRANSMISSION RANGES

Transmission ranges assume the presence of noise according to the ETSI model described in TS 101 135. The expected Bit Error Rate (BER) under this model is $1x10^{-7}$. The transmission ranges in such a noise environment at the various HDSL payload rates over one twisted-pair of 0.4 mm and 0.51 mm copper wire are listed below.

Transmission Ranges with ETSI Noise

HDSL Payload Rate (kbps) [(a)]	Wire Size and Transmission Range (with ETSI Noise)	
	0.4mm (26 AWG) Single Twisted-Pair Copper Wire	0.51mm (24 AWG) Single Twisted-Pair Copper Wire
256	4.1 km (13,451 ft.)	5.1 km (16,730 ft.)
384	3.9 km (12,795 ft.)	4.7 km (15,420 ft.)
512	3.5 km (11,483 ft.)	4.5 km (14,760 ft.)
768	3.2 km (10,499 ft.)	4.2 km (13,779 ft.)
1152	2.6 km (8,530 ft.)	3.4 km (11,155 ft.)
1536	2.2 km (7,218 ft.)	2.9 km (9,515 ft.)
2048	1.9 km (6,234 ft.)	2.4 km (7,874 ft.)

(a) A selected HDSL payload rate of 64 or 128 kbps is transmitted at 256 kbps (see "HDSL Payload Rates" on page 18).

(b) The maximum no-noise transmission range is approximately 7.1 km (4.4 miles).

COMPATIBILITY

The UTU-701C and ETU-751C are compatible with the following ADC WorldDSL products.

Shelves and Enclosures for UTU-701C

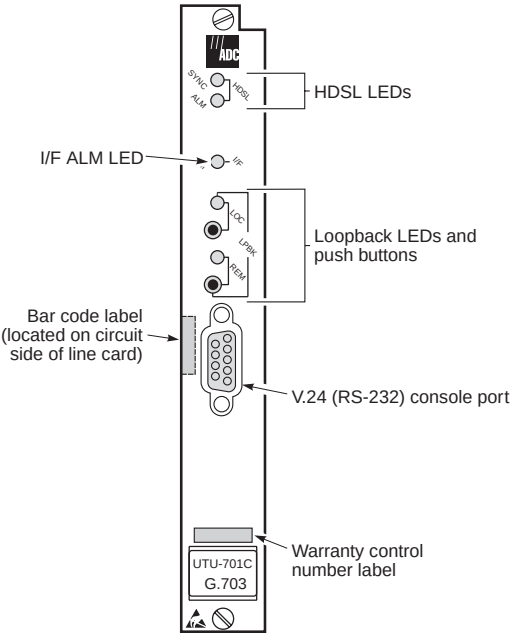
- EMS-830 List 2 Exchange Office Management Shelf, rear connector access (part number 150-1400-11).
- EMS-832 List 2 Exchange Office Management Shelf, front connector access (part number 150-1402-11).
- ERE-811 List xx Single-Slot Remote Enclosure with internal AC power supply (part number 150-1411-12 or higher).

Connector Adapters for ETU-751C

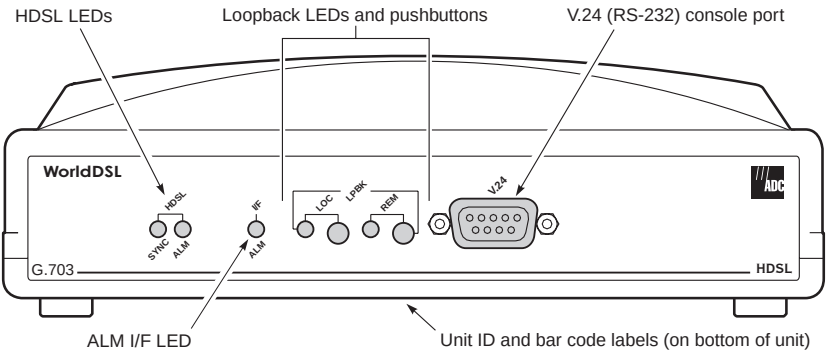
- ECA-802 DB9M to RJ-45 connector adapter (HDSL) (part number 150-1472-01)
- ECA-804 DB9M to 4-position terminal block connector (HDSL) (part number 150-1474-01)

FRONT PANELS

The components on the UTU-701C and ETU-751C front panels are shown below. Their functions are described on page 5 and page 6.



UTU-701C Front Panel



ETU-751C Front Panel

UTU and ETU Front Panel Components

Item	Function
HDSL SYNC LED	Displays synchronization state for the HDSL loop.
HDSL ALM LED	Displays alarm state for the HDSL loop.
I/F ALM LED	Displays alarm state for the G.703 data port.
LOC LPBK LED	Displays local (LOC) loopback state.
LOC LPBK Button	Activates the local HDSL analog loopback.
REM LPBK LED	Displays remote (REM) loopback state.
REM LPBK Button	Activates the remote interface loopback.
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.
Bar code label (all units)	Contains the serial number and part number of the unit, as indicated in both bar code and text format. Also contains the configuration number of the unit, as indicated by "CFG: R*nn,*" where *nn* is the configuration number. For example, CFG: R07 would indicate configuration number 07.
Warranty control number label (UTU-701C)	Indicates the beginning year and month of the line card warranty. Also indicates the line card revision number. For example, warranty control number "803R07" would indicate a warranty beginning in the year 1998 (8), during the month of March (03), and line card revision number (R07).
Unit ID label (ETU-751C)	Identifies the model number, manufacturer, part number, and input voltage range of the ETU.

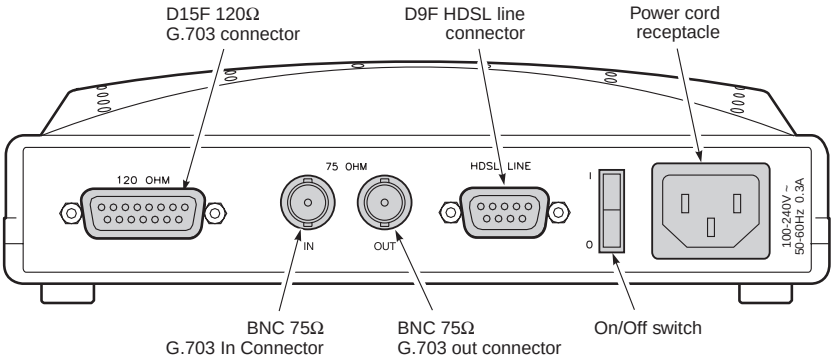
UTU and ETU Front Panel LED Indications

LED	Mode	Description
HDSL SYNC LED	Steady green	HDSL loop is ready to transmit and receive data across all spans.
	Slow flashing	HDSL loop acquisition is in progress for local span.
	Off	HDSL loop is not configured.
HDSL ALM LED	Steady red	Loss of sync word (LOSW); or the margin is below the set margin alarm threshold; or Errored Seconds (ES) count is above threshold on any span.
	Pulsing red	Pulses for every ES on any span.
	Off	Normal transmit or receive data is in progress.
I/F ALM LED	Steady red	Loss of Signal (LOS) alarm due to loss of G.703 signal or Loss of Clock (LOC) alarm due to loss of external clock (when using EXT timing).

For information on loopback testing and loopback LED indications, see the WorldDSL RS user guide, document number 700-701-100-xx. This document can be downloaded from the ADC website at *www.adc.com.* To order a hard copy, please contact your sales representative.

ETU-751C REAR PANEL

The components on the ETU-751C rear panel are shown and described below.



ETU-751C Rear Panel

ETU-751C Rear Panel Components

Item	Description
D15F 120Ω G.703 connector	Connects E1 balanced 120Ω circuits to the enclosure.
BNC 75Ω In/Out G.703 connectors	Connects E1 unbalanced 75Ω circuits to the enclosure.
D9F HDSL line connector	Connects the HDSL pairs to the enclosure.
On/Off switch	Rocker switch that allows you to turn the externally applied AC power on or off.
Power cord receptacle	Accepts female end of three-prong power cord supplying 100-240 Vac at 50-60 Hz.

INSTALLATION

This section contains instructions for installation of the UTU-701C line unit and the ETU-751C desktop unit.

INSPECTION

Before installing the line or desktop unit, inspect it for signs of damage. If the unit has been damaged in transit, immediately report the extent of the damage to the transportation company and to ADC DSL Systems, Inc.

SAFETY

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

Input voltage for the UTU-701C line unit (nominal -48 Vdc, tolerance -36 to -72 Vdc) must be supplied by an isolated DC source that complies with TNV or earthed SELV requirements of the latest version of IEC 950.

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. All wiring external to the product should follow the local wiring codes.

Die Eingangsspannung fuer die UTU-701C Karte is nominell –48 VDC, Toleranz -36 bis –72 VDC. Die Gleichstromquelle muss den Vorschriften gemäß der Norm EN60950 fuer Fernsprechnetzspannung (TNV) und Sicherheitskleinspannung (SELV) entsprechen.

Walte Vorsicht beim Installieren oder Ändern von Telefonlinien. Gefährliche Spannungen könnten anliegen. Es ist nicht sicher während eines Gewitters Telefondräte zu installieren.

Bevor Wartung oder Auseinandernehmen des Gerätes müssen immer alle Telefon- und Netzkabel ausgezogen werden. Alle externen Verdrahtungsarbeiten sollten nach den hiesigen Elektrizitätsvorschriften ausgeführt werden.

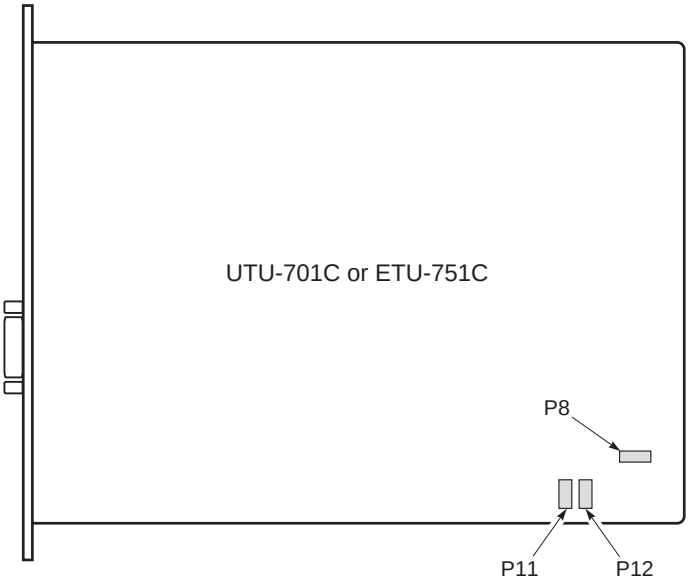
LINE AND DESKTOP UNIT INSTALLATION

This section describes the jumper and cable connections required when installing the UTU-701C line unit and the ETU-751C desktop unit.

Wear an antistatic wrist band connected to earth ground when installing these units. Avoid unnecessary contact with board-mounted components.

Jumper Settings

Jumpers must be set if using a 120Ω interface or if grounding your G.703 cables at the data port. The locations of these jumpers (P8, P11, and P12) are illustrated below.



Line and Desktop Unit Jumper Settings

To set the jumpers on the line or desktop unit:

1 If installing a desktop unit, remove the four screws on the bottom of the unit and set aside the top cover.

2 In compliance with the ITU G.703, jumper P8 allows connection of the outer conductor of the coaxial pair, or the screen of the symmetrical pair, to earth (frame ground) at the G.703 input data port. Do one of the following:

- Do not install a jumper. This is the factory setting and provides the standard G.703 input port interface.
- Short pins 1 and 2 of P8 for the 120Ω input.
- Short pins 2 and 3 of P8 for the 75Ω input.

3 Jumpers P11 and P12 configure the line unit for use with a 75Ω or 120Ω G.703 interface. Place the four-position jumper block on one of the following:

- P11 for balanced 120Ω circuits.
- P12 for unbalanced 75Ω circuits (factory setting).

Line Unit Installation

Primary protection for the HDSL line must be provided by the user. Both primary and secondary protection must be provided by the user if the E1 line runs outside of the building.

Der primaere Schutz des HDSL Anschlusses muss von der Benutzerseite aus geregelt werden. Wenn der E1 Anschluss ausserhalb des Gebaeudes installiert ist, muss der primaere und sekundaere Schutz von der Benutzerseite aus geregelt werden.

To install the line unit into a shelf or remote enclosure:

1 Install the line unit into the appropriate slot (1 through 16) of a shelf or into a single-slot remote enclosure. (See "Compatibility" on page 3.)

2 Connect the interface cabling and power connections using the procedures described in the technical practice for the shelf or remote enclosure in which the line units are installed.

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

Desktop Unit Installation

The ETU chassis must be connected to earth ground for protection of the equipment and for personnel safety.

Die Geraete Erdung des ETU muss via die Haupt-Erdung (Erdpotential) guarantiert werden, um das Geraet zu schuetzen und die Sicherheits des Personals zu gewaehrleisten.

To install the desktop unit:

1 Connect either the 120Ω cable or the 75Ω input and output cables from the DTE to the mating connectors on the ETU rear panel. The pinouts for the 75Ω and 120Ω connectors are listed in the following tables.

G.703 75Ω Output Connector Pinouts

Pin	Signal	Description
Center	E1_TTIP	G.703 Output, Tip
Shield	E1_TRING	G.703 Output, Ring

G.703 75Ω Input Connector Pinouts

Pin	Signal	Description
Center	E1_RTIP	G.703 Input, Tip
Shield	E1_RRING	G.703 Input, Ring

G.703 120Ω Interface Connector Pinouts

Pin [(a)]	Signal	Description
1	E1_RTIP	G.703 Input, Tip
2	E1_R120SCRN	G.703 Input port screen
3	E1_TTIP	G.703 Output, Tip
4	CGND	Chassis ground
9	E1_RRING	G.703 Input, Ring
11	E1_TRING	G.703 Output, Ring

(a) No other pins are used.

2 Connect the HDSL line cable from the DTE to the mating connector on the ETU rear panel. The pinouts for the HDSL line connector are listed at the top of page 12.

HDSL Line Connector Pinouts

Pin [a]	Signal	Description
4	HDSL_RING_A	HDSL Ring Loop 1
9	HDSL_TIP_A	HDSL Tip Loop 1
1	HDSL_RING_B	HDSL Ring Loop 2
6	HDSL_TIP_B	HDSL Tip Loop 2

(a) No other pins are used.

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

HDSL STARTUP AND SYNCHRONIZATION

At startup, a WorldDSL RS LTU confirms that it is communicating with a WorldDSL RS NTU. The LTU then synchronizes the NTU configuration with its own configuration.

1 Power up the shelf or enclosure where the units are installed.

2 Confirm the following:

- The HDSL ALM LED is on and the HDSL SYNC LED flashes once per second as the units self-configure and establish synchronization.
- After approximately 60 seconds the HDSL ALM LED is off and the HDSL SYNC LED is steady green. The units are now ready for configuration through the console screen menus.

If the HDSL SYNC LED continues to flash after 90 seconds, the HDSL line is faulty, the Local Unit Role is not configured as LTU, or one of the units is not a rate-selectable unit. Check for the correct line units and local unit role. Test the HDSL line using the loopbacks described in user manual 700-701-100-xx.

Changing the HDSL Payload Rate or Local Unit Role causes the unit to reset and the LEDs to cycle. Log on again by pressing the SPACEBAR several times (see "System Settings" on page 16).

SYSTEM CONFIGURATION

After synchronization is established, 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 also provides a special lockout feature that prevents users connected to the NTU console port from changing the circuit configuration. When this feature is enabled, the maintenance terminal connected to an NTU provides a read-only view of the entire 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

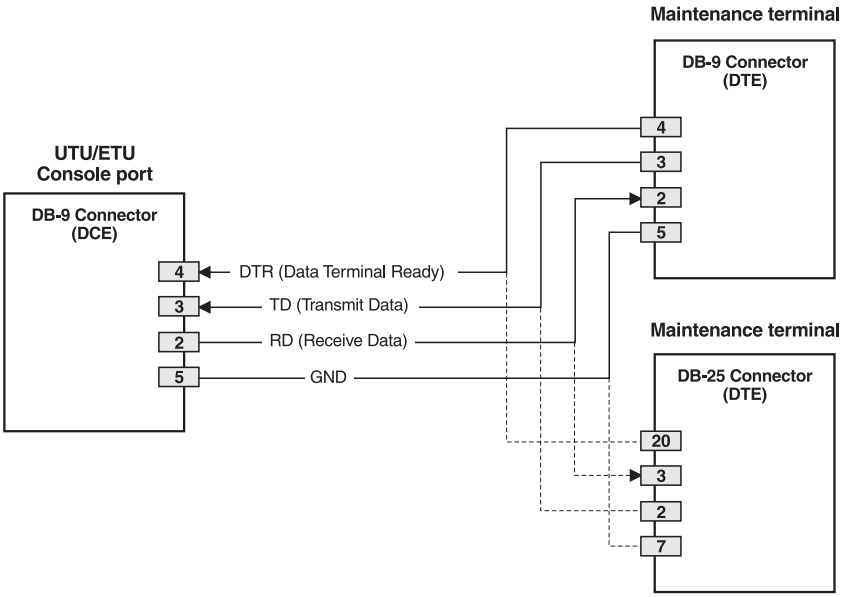
A maintenance terminal is used to access the line unit Console screen menus. Through these menus, the HDSL system is configured, monitored, tested, and its circuit inventory is displayed.

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 the diagram on the following page.

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



UTU/ETU Console Port and Maintenance Terminal 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.

Pressing the ENTER key activates 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 menu bar displays.

NAVIGATING MENUS

Use the keys described in the following table to navigate the Console screen and its menus.

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**	**CTRL** + **E** moves up one line in the History screens.
CTRL + **X**	**CTRL** + **X** moves down one line in the History screens.
CTRL + **C**	**CTRL** + **C** performs the page-down function in the History screens.
CTRL + **R**	**CTRL** + **R** performs the page-up function in the History screens.
SPACEBAR	Selects options displayed for current menu item. For example, to select a Local Unit Role of LTU or NTU from the Config System Settings menu: • press the ↓ key to highlight the Local Unit Role option, then • press the **SPACEBAR** until the desired option (LTU or NTU) is highlighted.
ESC	Exits the current screen and returns to the previous screen. Selection changes made on the current screen are discarded. Press **ESC** while in a text field to cancel the text entry and restore the old value.
ENTER	Applies all selections on the current screen. For example, to select an HDSL payload rate from the Config System Settings menu: • press the ↓ key to highlight the HDSL Payload Rate option, then • type the desired number of time slots (1 to 32) and press **ENTER** to display the selected HDSL payload rate.

SYSTEM SETTINGS

The following table lists the settings available in the *Config System Settings* menu. The settings in boldface type are factory default settings.

Settings in Config System Settings Menu

Settings	Description
Application Mode [a]	
SINGLE	System uses a single pair of twisted copper wires to transport data.
HDSL Rate Mode [a]	Selects the mode by which the HDSL payload rate will be set.
MANUAL	HDSL payload rate is set by number of time slots manually entered for the HDSL Payload Rate option.[b] Each time slot is 64 kbps.
HDSL Payload Rate	Type a time slot value of 1 through 32, and then press ENTER to set and display the "indicated" HDSL payload rate. [c] [d] [e] [f]
256 kbps/4	
Remote Console Access	Selects whether a maintenance terminal connected to an NTU can affect system changes or is read-only. This field may be set only at the LTU.
ALLOWED	NTU Console screens can be used to configure the system.
BLOCKED	NTU Console screens are read-only. The LOC and REM pushbuttons on the NTU are also disabled. System changes can only be made from the LTU.
Local Unit Role	Configures the UTU or ETU as an LTU (master) or NTU (slave). The default configuration is NTU (slave).
LTU	Configures the UTU or ETU as an LTU (master). The LTU-configured rate selectable UTU/ETU does not provide line power to other HDSL units.
UTU	Configures the UTU or ETU as an NTU (slave). The NTU-configured rate selectable UTU/ETU does not provide line power to other HDSL units.

(a) SINGLE is the only Application Mode. Manual is the only HDSL Rate Mode.
(b) UTU-701C and ETU-751C have 32 time slots (TSs) available for HDSL payload rates of 256 kbps to 2048 kbps.
(c) When communicating with another RS G.703 unit, the actual HDSL payload rate is as follows:
- If set to 64 or 128 kbps (1 or 2 TSs), the actual HDSL payload rate is 256 kbps.
- If set to less than 1984 kbps (31 TSs), the rate is the indicated rate plus 128 kbps.
- If set to 1984 kbps (31 TSs), the actual rate is 2048 kbps. See "HDSL Payload Rates" on page 18.

(d) When RS G.703 units communicate with RS V.35 units, the HDSL payload rates are as described in the RS V.35 documentation.
(e) Data transmission switches to unstructured mode when set for 32 TSs (2048 kbps).
(f) Indicated payload rates are displayed in the Config LTU and Config NTU Interface menus as Data Rate/# of TSs (data rate/number of time slots).

LTU AND NTU INTERFACE SETTINGS

The following table lists the settings available in the Config LTU and Config NTU Interface menus. The settings in boldface type are factory default settings.

Settings in Config LTU and Config NTU Interface Menus

Settings	Description
Primary Timing Source	Selects the clock source for the HDSL transmit direction.
EXT	External 2.048 MHz clock (UTU-701C only)
G.703	Input E1 clock
	G.703 Port
CRC-4 Mode	Cylic Redundancy Check (CRC) to detect errors in transmitted data. Available only when less than 32 time slots are selected (places unit in structured application mode).
DIS	CRC-4 mode is disabled. CRC-4 mode is not available (N/A) when 32 time slots are selected (places unit in unstuctured application mode).
ENA	The input G.703 signal is monitored for CRC-4 multiframe errors. A new CRC-4 code is output for use at the remote unit. Detected errors are displayed in the Monitor LTU and NTU Interface screens.
PASSTHRU	All time slot 0 bits are passed unchanged to the remote unit. Useful when detection of CRC-4 errors is performed by customer equipment.
Idle Code	User inputs the idle pattern (from 00 to FF) transmitted in unused time slots from LTU or NTU G.703 port. Factory default setting is **FF**.
Data Rate/# of TSs	Read-only display of indicated HDSL data rate and corresponding number of time slots (TSs) as set with HDSL Payload Rate option in the Config System Settings menu (See "HDSL Payload Rates" on page 18). Default setting is **256kbps/4**.
Beginning TS	Read-only display of beginning time slot. This setting is 0 (zero) in the structured mode and one (1) in the unstructured mode.

HDSL PAYLOAD RATES

As illustrated in the following table, time slots 0 and 16 cause the rate selectable G.703 system to increase the selected HDSL payload rate by either 128 kbps (1 through 30 time slots selected) or 64 kbps (31 time slots selected). In structured mode, however, time slots 0 and 16 do not contain data and are transparent to the G.703 input. The transmitted G.703 data, therefore, arrives at both the customer and network DTE at the selected HDSL payload rate.

Actual HDSL Payload Rates – Rate Selectable G.703

Nx64k Time Slots Selected	Indicated HDSL Payload Rate (kbps)	Time Slots Added by System	Actual HDSL Payload Rate (kbps)
1 or 2	128	0 and 16	256
3 through 30	192 to 1920	0 and 16	320 to 2048
31	1984	0	2048
32 [(a)]	2048	–	2048

(a) Automatically switches from structured to unstructured transmission mode when 32 time slots are selected.

VIEWING STATUS

View status using a maintenance terminal or PC running a terminal emulation program connected to the 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.

The following table lists the information displayed in each field of the main console screen.

Information Displayed in Main Console Screen

Field	Description
	Circuit Configuration
G.703	Indicates the interface standard for G.703 data port.
n TS	Indicates the number of time slots (*n*) mapped to the G.703 interface.
Timing	Indicates the primary source the unit uses for clock synchronization:
EXT	External 2.048 MHz clock.
G.703	G.703 port receive clock.
Application mode	Indicates that the Single Pair (SINGLE) application mode is in effect.
	Performance
MAR1	Displays the Margin value for each HDSL interface or displays link status (SIG, ACQ, etc.) if the link is not up.
MAR2	Reserved
ES1	Displays the Errored Seconds (ES) counts for each HDSL interface. The counts are for the latest 24-hour period, calculated as the sum of the counts in the previous 95 15-minute intervals, plus the count in the current 15-minute interval.
ES2	Reserved
	Alarms
The Alarms field displays a list of all active alarms at each LTU/NTU and HDSL interface.	
	Possible LTU/NTU Interface Alarms
Loss of Signal (LOS)	Loss of signal at the G.703 input.
Loss of Frame Alignment (LFA)	Loss of frame alignment at the G.703 input.
Receive Alarm Indication Signal (AIS)	Alarm indication signal (unframed all ones) received at the G.703 input.
Remote Alarm Indication Signal (RAI)	Remote alarm indication signal received at the G.703 input (through A-bit).

Continued

Information Displayed in Main Console Screen (Cont.)

Field	Description
Loss of Clock (LOC)	Applies to loss of external 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 alarms	
Margin (MAR)	Margin has fallen below threshold set for the HDSL interface.
Errored Seconds (ES)	Errored seconds count has exceeded threshold set for the HDSL interface.
Loss of Sync Word (LOSW)	Loss of sync word at the HDSL interface. Remains active during restart, but not a cold start.
Power Feed Open (PFO)	Not supported. These units do not supply power to other units.
Power Feed Short (PFS)	Not supported. These units do not supply power to other units.

MONITOR SCREENS

The Monitor screens display the signal activity at the LTU/NTU serial data port, and the 24-hour error counts and other information from the HDSL Span 1 interface.

Monitor LTU and NTU Interface Screens

The following table lists the information displayed in each field of the Monitor LTU and Monitor NTU Interface screens.

Information Displayed in Monitor LTU and NTU Interface Screens

Field	Description
	G.703 Port
Errored Seconds (ES) 24 Hour Count	The number of one-second intervals in which at least one bipolar violation (BPV) or one CRC-4 error was detected at the G.703 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-4 Multiframe) Alignment (LFA) occurred at the incoming port.
Unavailable Seconds (UAS) 24 Hour Count	The number of seconds that G.703 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.
CRC Errored Seconds (Cumulative)	The number of CRC-4 errors that were detected at the G.703 port since error counters were last cleared. Turning CRC-4 mode on (ENA) and off (DIS) clears the CRC-4 error counter.
Bipolar Violation Seconds (Cumulative)	The number of seconds in which bipolar violations were detected at the G.703 port since error counters were last cleared.
Clear 24-Hour 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 1 Screen

The following table lists the information displayed in each field of the Monitor HDSL Span 1 screen.

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 the last clearance of the 24-hour history.
High Margin (dB)	Indicates the highest margin since startup or the last clearance of the 24-hour history.
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 41 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.
HDSL Tip/Ring Reversal	Indicates whether the two conductors of the HDSL span are correctly connected or have been interchanged. The system automatically compensates for an interchange of wire leads.
Clear 24 Hour 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.

PRODUCT SUPPORT

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

Technical support is available 24 hours a day, 7 days a week by contacting the ADC Technical Assistance Center at the number listed below.

Sales Assistance 800.366.3891 ext. 73000 (USA and Canada) or 952.917.3000 Fax: 952.917.3237	• Quotation Proposals • Ordering and Delivery • General Product Information
Systems Integration 800.366.3891, ext. 73000 (USA and Canada) or 952.917.3000	• Complete Solutions (from concept to installation) • Network Design and Integration Testing • System Turn-Up and Testing • Network Monitoring (upstream or downstream) • Power Monitoring and Remote Surveillance • Service/Maintenance Agreements • Systems Operation
ADC Technical Assistance Center 800.638.0031 (USA and Canada) or 714.730.3222 Fax: 714.730.2400 Email: wsd_support@adc.com	• Technical Information • System/Network Configuration • Product Specification and Application • Training (product-specific) • Installation and Operation Assistance • Troubleshooting and Repair/Field Assistance
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Product Return Department 800.366.3891 ext. 73748 (USA and Canada) or 952.917.3748 Fax: 952.917.3237 Email: repair&return@adc.com	• ADC Return Material Authorization (RMA) number and instructions must be obtained before returning products.
All 800 lines are toll-free in the USA and Canada.	

CERTIFICATION AND WARRANTY

DIRECTIVE EN300 386-2 COMPLIANCE

To indicate compliance with EN300 386-2, the complete ADC WorldDSL product line has been affixed with the CE mark.

LIMITED WARRANTY

ADC DSL Systems, Incorporated (“ADC”) warrants that, for a period of sixty (60) months from the date of shipment, the hardware portion of its products will be free of material defects and faulty workmanship under normal use. ADC's obligation, under this warranty, is limited to replacing or repairing, at ADC's option, any such hardware product which is returned during the 60-month warranty period per ADC's instructions and which product is confirmed by ADC not to comply with the foregoing warranty.

ADC warrants that, for a period of 90 days from the date of purchase, the software furnished with its products will operate substantially in accordance with the ADC published specifications and documentation for such software. ADC’s entire liability for software that does not comply with the foregoing warranty and is reported to ADC during the 90-day warranty period is, at ADC’s option, either (a) return of the price paid or (b) repair or replace of the software. ADC also warrants that, for a period of thirty (30) days from the date of purchase, the media on which software is stored will be free from material defects under normal use. ADC will replace defective media at no charge if it is returned to ADC during the 30-day warranty period along with proof of the date of shipment.

The transportation charges for shipment of returned products to ADC will be prepaid by the Buyer. ADC will pay transportation charges for shipment of replacement products to Buyer, unless no trouble is found (NTF), in which case the Buyer will pay transportation charges.

ADC may use reconditioned parts for such repair or replacement. This warranty ***does not*** apply to any product which has been repaired, worked upon, or altered by persons not authorized by ADC or in ADC's sole judgment has been subjected to misuse, accident, fire or other casualty, or operation beyond its design range.

Repaired products have a 90-day warranty, or until the end of the original warranty period—whichever period is greater.

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MODIFICATIONS

Any changes or modifications made to these devices that are not expressly approved by ADC DSL Systems voids the user's warranty.

All wiring external to the product should follow local wiring codes.

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