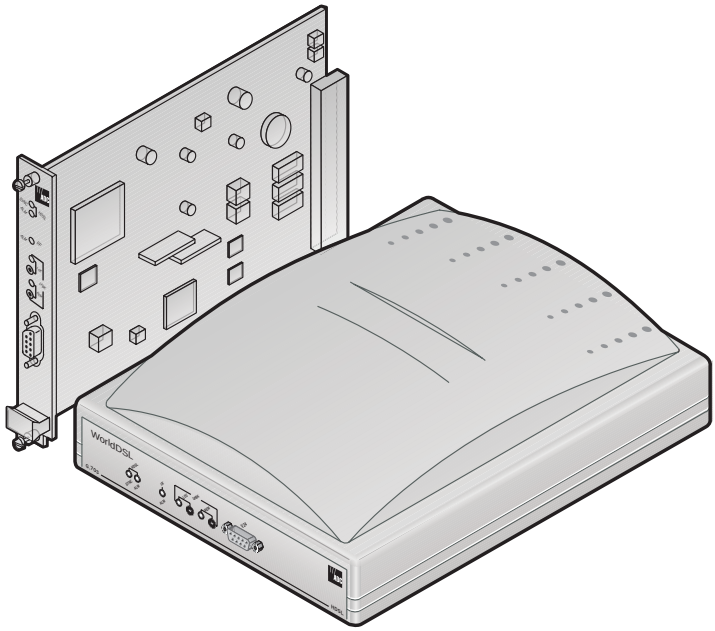
WorldDSL

QUICK INSTALLATION GUIDE

UTU-702C List 1
Rate Selectable Line Unit
Part Number: 150-1422-02C

ETU-752C List 1
Rate Selectable Desktop Unit
Part Number: 150-1432-02C



ADC

Revision History of This Guide

Copies of this document or the UTU/ETU user manual (700-702-100-xx) can be downloaded from the ADC website at *www.adc.com*.

Revision	Release Date	Revisions Made
1	March 23, 1999	Initial release
2	April 16, 1999	Revised label descriptions
3	June 21, 1999	Added pinouts for ETU-752 HDSL line and console port connectors.
4	June 14, 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 21. If you must store the equipment for a prolonged period, store the equipment in its original container.

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OVERVIEW

This guide contains installation information for the ADC WorldDSL™ RS UTU-702C List 1 and ETU-752C List 1 Rate Selectable (RS) line and desktop units.

RATE SELECTABLE HDSL

WorldDSL RS 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-702C and ETU-752C deploy HDSL in networks using a single pair of copper wire running at speeds between 64 kbps and 2048 kbps. The HDSL line rates are either menu selected in time slot increments of 64 kbps or derived automatically from the Terminal Transmission (TT) clock received at the Nx64k serial data port from the Network Data Terminal Equipment (DTE). Transmission ranges vary according to the rate selected. Depending on noise environment, ranges of up to 8.5 km (5.3 miles) are possible at the lowest-selectable HDSL line rates (64 and 128 kbps).

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.

WorldDSL RS units must have the same payload rates available. An LTU set for a rate of 768 kbps will not function with an NTU whose maximum available rate is 256 kbps.

UTU-702C LINE UNIT

The UTU-702C 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-702C serves as the Exchange Office side of a repeaterless, HDSL transmission system. The LTU-configured unit connects to an NTU-configured unit (UTU-702C or ETU-752C) over one twisted-pair of copper wire, completing the HDSL transmission system.

The UTU-702C has an Nx64k serial data interface with user-selectable protocols that include V.35, V.36, X.21, and RS-530 (RS-449). The UTU-702C accepts the DTE payload at its Nx64k serial data port and transports the data to the remote unit at the selected HDSL rate. The UTU-702C 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-752C DESKTOP UNIT

The ETU-752C is housed in a plastic enclosure with interface and power connectors for use as an integrated desktop unit. All functions of the ETU-752C, with exception of power requirements, are identical to the UTU-702C. The ETU-752C requires a source of 100 to 240 volt, 50 or 60 Hz, AC power.

INTEROPERABILITY

The UTU-702C and ETU-752C are interoperable with the UTU-702 and/or ETU-752.

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 10^{-7}. The transmission ranges in such a noise environment at the various HDSL line rates over one twisted-pair of 0.4 mm and 0.51 mm copper wire are listed below.

Transmission Ranges with ETSI Noise

HDSL Line 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
128	5.0 km (16,404 ft.)	6.3 km (20,669 ft.) [b]
256	4.1 km (13,451 ft.)	5.1 km (16,732 ft.)
384	3.9 km (12,795 ft.)	4.7 km (15,420 ft.)
512	3.5 km (11,483 ft.)	4.5 km (14,764 ft.)
768	3.2 km (10,499 ft.)	4.1 km (13,451 ft.)
1152	2.6 km (8,530 ft.)	3.4 km (11,155 ft.)
1536	2.2 km (7,218 ft.)	2.9 km (9,514 ft.)
2048	1.9 km (6,234 ft.)	2.3 km (7,546 ft.)

(a) A selected HDSL line rate of 64 kbps is transmitted at 128 kbps.
(b) The maximum no-noise transmission range is approximately 8.5 km.

COMPATIBILITY

The UTU-702C and ETU-752C are compatible with the following ADC WorldDSL products.

Shelves and Enclosures for UTU-702C

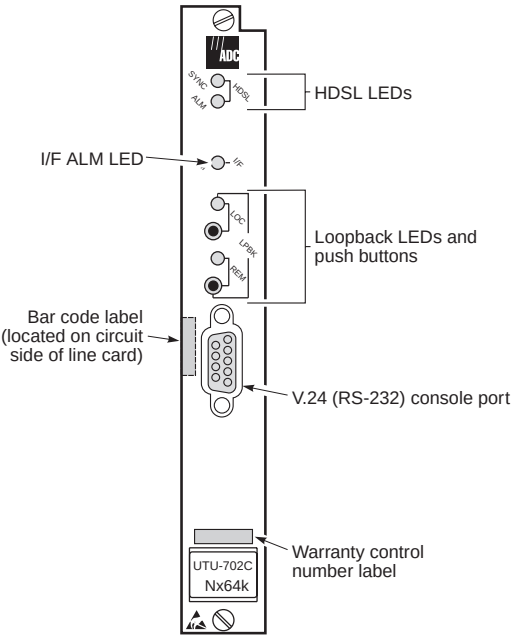
- EMS-830 Exchange Office Management Shelf, rear connector access (part number 150-1400-01).
- EMS-831 Exchange Office Management Shelf, front connector access (part number 150-1401-01).
- EMS-832 Exchange Office Management Shelf, front connector access (part number 150-1402-01).
- ERE-810 Single-Slot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

Connector Adapters for ETU-752C

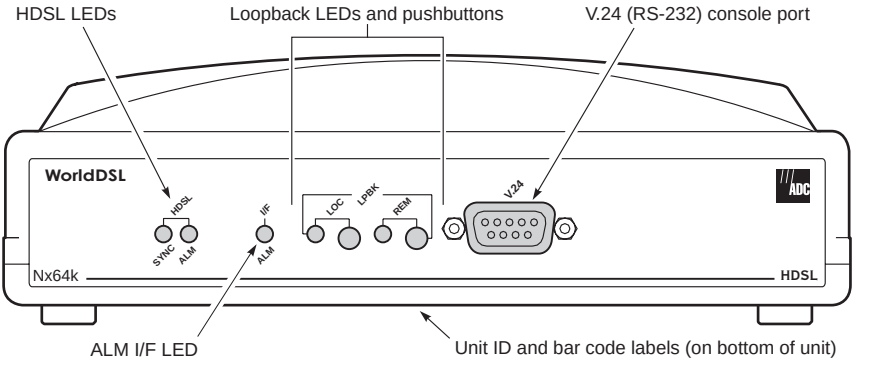
- ECA-800 D25M to M34F connector adapter for V.35 (part number 150-1470-01).
- ECA-801 D25M to D15F connector adapter for X.21 (part number 150-1471-01).
- ECA-802 DB9M to RJ-45 connector adapter for HDSL (part number 150-1472-01).
- ECA-804 DB9M to 4-position terminal block connector for HDSL (part number 150-1474-01).
- ECA-807 DB25M to DB37F connector adapter for RS-449 (part number 150-1477-01).

FRONT PANELS

The components on the UTU-702C and ETU-752C front panels are shown below. Their functions are described on page 5 and page 6.



UTU-702C Front Panel



UTU-752C 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 the Nx64k interface (I/F) alarm state.
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-702C)	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-752C)	Identifies the model number, manufacturer, part number, and input voltage range of the ETU.

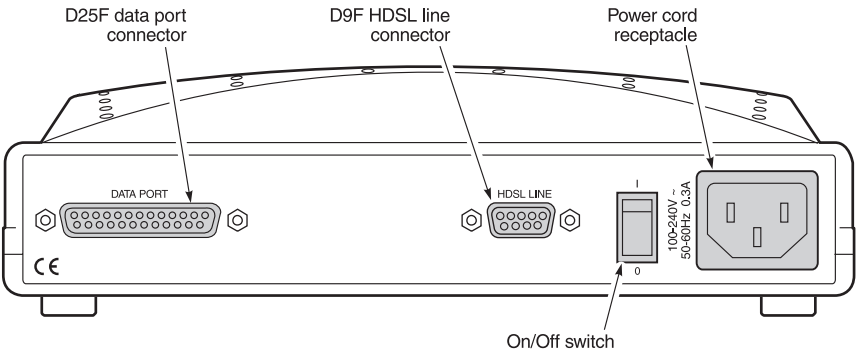
UTU and ETU Front Panel LED Indications

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	Indicates: • Loss of sync word (LOSW) • Margin is below the set margin alarm threshold • 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 Clock (LOC) alarm due to loss of TT clock (Nx64k timing) or external clock (EXT timing).

For information on loopback testing and loopback LED indications, see the *WorldDSL RS Rate Selectable HDSL Line and Desktop Units* user manual, section 700-702-100-xx. This document can be downloaded from the ADC website at *www.adc.com*.

ETU-752C REAR PANEL

The components on the ETU-752C rear panel are shown and described below.



ETU-752C Rear Panel

ETU-752C Rear Panel Components

Item	Description
D25F data port connector	Connects Nx64k data circuits to the enclosure.
D9F HDSL line connector	Connects the HDSL pairs to the enclosure.
Power cord receptacle	Connects an AC power cord to the enclosure.
On/Off switch	Rocker switch that allows you to turn the externally applied AC power on or off.

INSTALLATION

This section contains instructions for installation of the UTU-702C line unit and the ETU-752C 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:

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

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. Aus Leistungs- und Sicherheitsgründen sollten nur Netzteile die für Telefongeräte zugeschnitten und von einem renommierten Geschäft vertrieben werden mit ADC Geräten verwendet werden. Alle externen Verdrahtungsarbeiten sollten nach den hiesigen Elektrizitätsvorschriften ausgeführt werden.

LINE UNIT INSTALLATION

To install the UTU-702C line unit 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.

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

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 If configuring the line unit as an LTU, power up the shelf and proceed as instructed on pages 12 through 15 to access the Local Unit Role option in the *Config System Settings* menu (the default setting is NTU).

4 Connect the data port and HDSL line cabling as instructed in the technical practice for the shelf or remote enclosure in which the line unit is installed.

5 Set the DTE interface (TT clock) for the default HDSL payload rate of 256 kbps (4 time slots).

DESKTOP UNIT INSTALLATION

To install an ETU-752C desktop unit:

1 Insert the AC power cord into the power cord receptacle on the ETU rear panel.

2 Plug the power cord into a source of 100 to 240 volt, 50 or 60 Hz AC power.

3 If configuring the desktop unit as an LTU, power up the unit and proceed as instructed on pages 12 through 15 to access the Local Unit Role option in the *Config System Settings* menu (the default setting is NTU).

4 Connect the data port cable from the DTE to the data port connector on the ETU-752C rear panel.

5 Connect the HDSL line cable to the HDSL line connector on the ETU rear panel. The pinouts for the HDSL line connector are listed in the following table.

HDSL Line Connector (DB9F) Pinouts

Pin*	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

* No other pins are used.

6 Set the DTE interface (TT clock) for the default HDSL payload rate of 256 kbps (4 time slots).

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.

Power up the LTU and NTU. The following synchronization sequence should occur:

1 Power up the shelf or enclosure where the unit(s) 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 a 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 technical practice 700-702-100-xx.

The LTU and NTU will reset and their LEDs will sequence through the startup cycle following any change to the HDSL Payload Rate option (see "System Settings" on page 15).

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 plugged into the NTU console port from changing the circuit configuration. When 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

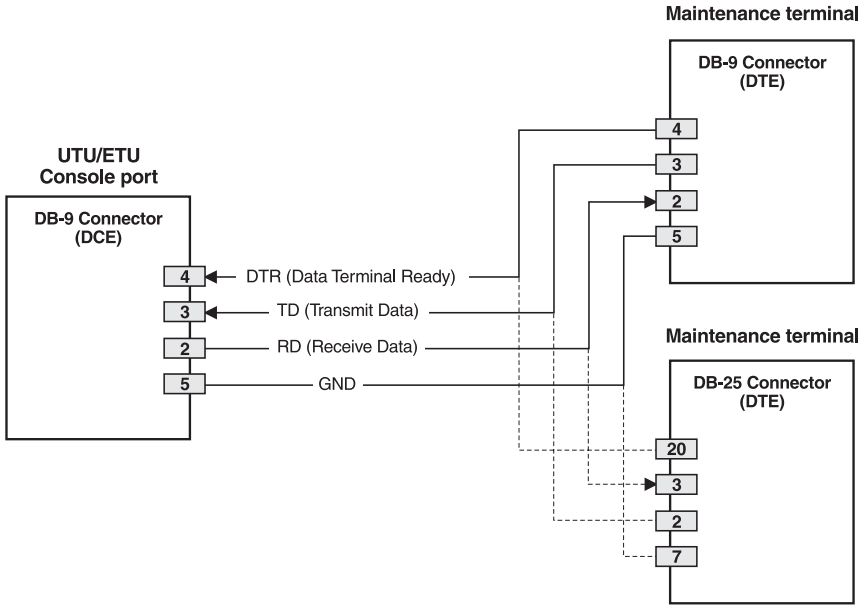
A maintenance terminal is used to access the line unit console screen menus. Through these menus, the HDSL system is configured, monitored, tested, and its circuit inventory is displayed.

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 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 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 MANUAL or Nx64k AUTO mode from the Config System Settings menu: • press the ↓ key to highlight the HDSL Rate Mode option, then • press the SPACEBAR until the desired option (MANUAL or Nx64k AUTO) 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 (in MANUAL mode only).

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 wire to transport data.
HDSL Rate Mode	Selects the mode by which the HDSL payload rate will be set.
MANUAL	HDSL payload rate is set by number of time slots entered for the HDSL Payload Rate option.[b] Each time slot is 64 kbps.
Nx64K AUTO	HDSL payload rate is set by TT clock input at Nx64k data port.
HDSL Payload Rate [c] **256 kbps/4**	Typing a time slot value of 1 through 32 and pressing ENTER sets and displays the HDSL payload rate (in MANUAL mode only). Payload rate is automatically set in Nx64K AUTO mode. [d] [e]
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.
Protect Switch Mode	Not available on Nx64k serial data port units.
Local Unit Role	Configures UTU or ETU as LTU (master) or NTU (slave). The default configuration is NTU (slave).
LTU	Configures UTU or ETU as LTU (master). The LTU-configured rate selectable UTU/ETU does not provide line power to other HDSL units.
NTU	Configures UTU or ETU as 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.
(b) UTU-702C and ETU-752C have 32 time slots available for rates of 64 kbps to 2048 kbps.
(c) An HDSL Payload Rate of 64 kbps (1 time slot) is transmitted at 128 kbps.
(d) Payload rates in both the MANUAL and Nx64K AUTO modes are displayed in the Config LTU and Config NTU Interface menus as Data Rate/# of TSs (data rate/number of time slots).
(e) 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.

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 [(a)]	Selects the clock source for the HDSL transmit direction. Choices are: • **INT** - Internal Oscillator • EXT - External 2.048 MHz clock (UTU-702C only) • Nx64k - Nx64k Serial Data port receive clock (TT) • HDSL - Recovered clock from received HDSL data
Nx64k Port	
Interface Type	Select the interface standard for serial data port. Choices are: V.35, **V.36**, X.21, and RS-530.
Data Rate/# of TSs	Read-only display of HDSL data rate and corresponding number of time slots (TSs) as set automatically by TT clock (Nx64K AUTO mode) or by HDSL Payload Rate option in Config System Settings menu (MANUAL mode). Default setting is **256kbps/4**.
Beginning TS	Read-only display of beginning time slot. For these units Beginning TS is always 0 (zero).
Transmit Clock	Selects the transmit data (SD) clock as External (EXT), Internal Rising Edge (**INT_RISING**), or Internal Falling Edge (INT_FALLING). Transmit clock is always EXT if the Timing Source is Nx64k.
CTS DSR RLSD	Specifies one of three methods the LTU/NTU uses to generate the Clear to Send (CTS), Data Set Ready (DSR), and Received Line Signal Detect (RLSD) control signals for the V.35/V36 port. The V.35/V.36 port is hardware-configured as DCE. Set each of these parameters to match the requirements of the application. 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	Selects whether the LTU/NTU responds to (enabled) or ignores (disabled) the Local Loopback (LL) and Remote Loopback (RL) input control signals. The enabled (**ENA**) status appears on the display.

(a) Primary Timing Source automatically set to Nx64k in Nx64K AUTO mode.

VIEWING STATUS

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

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
V.35/V.36/X.21/ RS-530	Indicates the interface standard for Nx64k serial data port.
n k	Indicates the data rate in number of kbps (*n* k) mapped to the Nx64k interface.
Timing	Indicates the primary source the LTU/NTU uses for clock synchronization:
INT	Internal oscillator.
EXT	External 2.048 MHz.
Nx64k	Serial data port receive clock.
HDSL	Recovered clock from received HDSL data.
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.

Information Displayed in Main Console Screen (Cont.)

Field	Description
ES1	Displays the 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 Nx64k port alarms	
LOC	Loss of incoming clock (TT) at the serial data port (only enabled if the primary timing source is Nx64k or if the transmit clock mode is set to EXT).
Possible External Clock Alarms	
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	
MAR1	Margin threshold has fallen below alarm threshold for the HDSL interface.
ES1	Errored second count has exceeded alarm threshold for the HDSL interface.
LOSW1	Loss of sync word for the HDSL interface. Remains active during restart, but not a cold start.

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
Nx64k Port	
Data & Clk Activity	Displays the status of the TT (terminal timing), SD (transmit data), ST (send timing), RT (receive timing), and RD (receive data) 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 RTS (ready to send), DTR (data terminal ready), RL, LL, CTS, DSR, RLSD, and TM (test mode) 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 24 Hour History	Not available from this screen on Nx64k serial data port units. Use clear history options in console screen History menu.

Monitor HDSL Span 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	Not available from this screen on Nx64k serial data port units. Use clear history options in console screen History menu.

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
Online Technical Support	• www.adc.com/Knowledge_Base/index.jsp
Online Technical Publications	• www.adc.com/library1/
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.

ADC DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND ANY ACCOMPANYING WRITTEN MATERIALS. FURTHER, ADC DOES NOT WARRANT THAT SOFTWARE WILL BE FREE FROM BUGS OR THAT ITS USE WILL BE UNINTERRUPTED OR REGARDING THE USE, OR THE RESULTS OF THE USE, OF THE SOFTWARE IN TERMS OF CORRECTNESS, ACCURACY, RELIABILITY OR OTHERWISE.

MODIFICATIONS

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

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

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