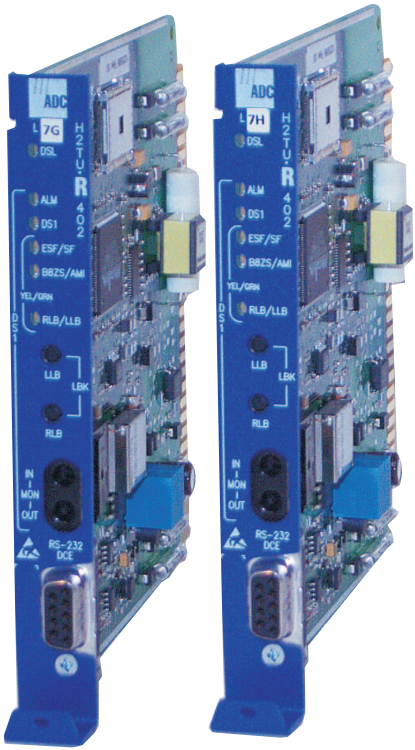
QUICK INSTALLATION



HIGAIN
H2TU-R-402 LIST 7G (LINE POWER)
H2TU-R-402 LIST 7H (LOCAL POWER)
REMOTE UNIT

THE H2TU-R-402 LIST 7G/LIST 7H

The H2TU-R-402 List 7G/List 7H (H2TU-R) functions as the remote end of a repeaterless T1 transmission system when connected to a HiGain®, Wideband System 3190, or Soneplex® HDSL2 line unit (H2TU-C). The H2TU-R-402 List 7G is line powered and the H2TU-R-402 List 7H is locally powered. Setting new standards for interoperability and efficiency, HiGain HDSL2 modules transmit 1.544 Mbps T1 payload on one unconditioned copper pair over the full Carrier Service Area (CSA) range.

FEATURES

Front panel: status LEDs, craft port, DS1 monitor jacks, and loopback control pushbuttons for test access

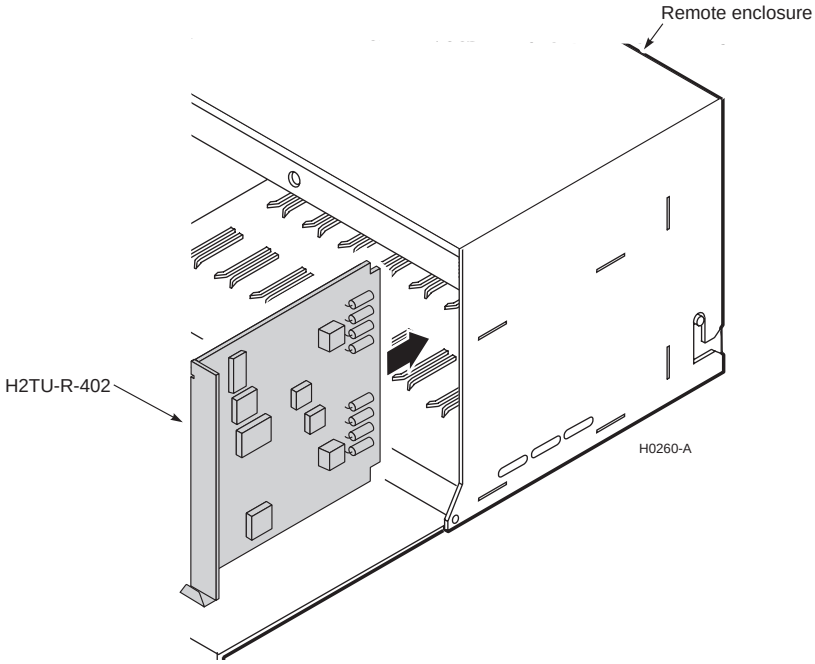
Maintenance screens for inventory, provisioning, performance monitoring, and troubleshooting, including:

- Remote provisioning through TL1 FDL commands
- Loop attenuation and insertion loss reporting
- HDSL2 Tip/Ring reversal indication
- Power Back Off (PBON and PBOC) for configuring HDSL2 transmit power to reduce crosstalk
- Automatic circuit retrain to ensure quality service
- Enhanced lightning protection

SPECIFICATIONS

Operating Temperature	-40°F to +149°F (-40°C to + 65°C)
Operating Humidity	5% to 95% non-condensing
Line Power Consumption	2.7 Watts
Electrical Protection	Secondary surge and power cross-protection on all DS1 and HDSL2 ports
Mounting	Any 400 or 200 mechanics shelf
HDSL2 Line Rate	1.552 Mbps Overlapped Pulse amplitude modulated Transmission with Interlocking Spectra (OPTIS)
HDSL2 Output	+16.5 dBm ±0.5 dBm, 135Ω
DS1 Pulse Output	0 dB, -7.5 dB, -15 dB
DS1 Receiver Sensitivity	0 dB to -36 dB at 100Ω
Maximum Insertion Loss	35 dB at 196 KHz, 135Ω
Maximum Loop Attenuation	28 dB
DS1 Line Rate	1.544 Mbps ±200 bps
DS1 Line Format	Alternate Mark Inversion (AMI) or Bipolar with 8-zero Substitution (B8ZS)
DS1 Frame Format	Extended SuperFrame (ESF), SuperFrame (SF), or Unframed (UNFR)

1 INSTALLATION



Wear an antistatic wrist strap when installing the H2TU-R. Avoid touching components on the circuit board.

1 Align the H2TU-R with the enclosure slot guides and slide the unit in until it touches the backplane card-edge connector.

2 Place your thumbs on the H2TU-R front panel and push the unit into the card-edge connector.

Continued

2 VERIFICATION

Once installed, verify that the H2TU-R is operating properly by monitoring the Status LEDs on the front panel.

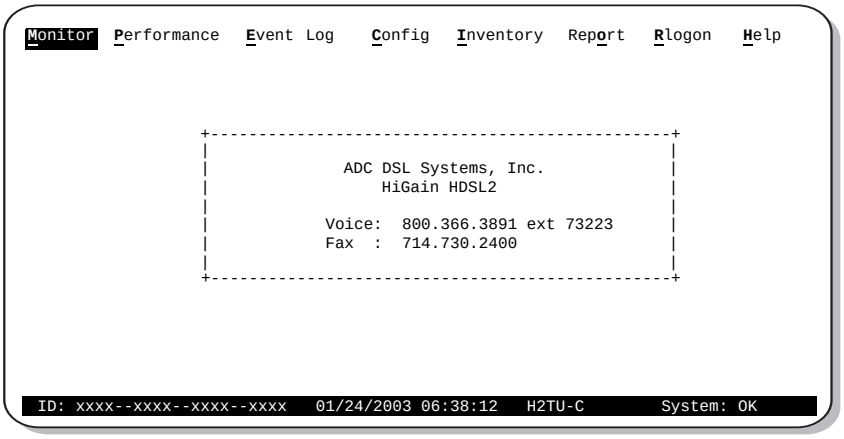
Table 1. *LED Status and Functions*

LED/Status	Function
DSL	
OFF	No power is applied to the H2TU-R.
Solid green	Normal operation: the HDSL2 span is synchronized.
Solid red	HBER, MARG, or PWR alarm is present at the H2TU-R.
Flashing red once per second	HDSL2 loop is attempting synchronization.
ALM	
OFF	Normal operation: the DS-1 signal is present at both the H2TU-R and H2TU-C.
Solid yellow	LLOS is present at the H2TU-C.
Solid red	RLOS is present at the H2TU-R.
DS1	
Solid green	Normal operation: the DS1 signal at the H2TU-R is error free.
Solid red	RLOS, BPV, frame error, or CRC is detected at the H2TU-R.
ESF/SF	
OFF	Unframed DS1 present at the H2TU-R, unit set as unframed, or no DS1 is detected at the H2TU-R.
Solid yellow	ESF frame formatting is present at the H2TU-R.
Flashing yellow once per second	ESF frame formatting and frame error/CRC are present at the H2TU-R.
Solid green	SF frame formatting is present at the H2TU-R.
Flashing green once per second	SF frame formatting and frame error are present at the H2TU-R.
B8ZS/AMI	
Solid yellow	B8ZS line code is present at the H2TU-R.
Flashing yellow once per second	B8ZS and excess zeros string are present at the H2TU-R.
Solid green	AMI line code is present at the H2TU-R.
Flashing green once per second	AMI and BPV are present at the H2TU-R.
LLB/RLB	
OFF	H2TU-R is not ARMed or in loopback.
Solid yellow	H2TU-C is in either NLOC or CREM (RLB).
Solid green	H2TU-R is in either NREM or CLOC (LLB).

3 LOGGING ON TO THE MAIN MENU

The H2TU-R supports local and remote logon through a maintenance terminal (ASCII terminal or a PC running terminal emulation software) connected to the craft port on the H2TU-R front panel.

Logging on creates menus and screens for the H2TU-R that are replications of those viewed at the H2TU-C. Once logged on, you can view system settings and inventory, initiate loopbacks, monitor performance, and configure the circuit.



To log on using a maintenance terminal:

1 Press CTRL + R to refresh the Logon screen, if necessary.

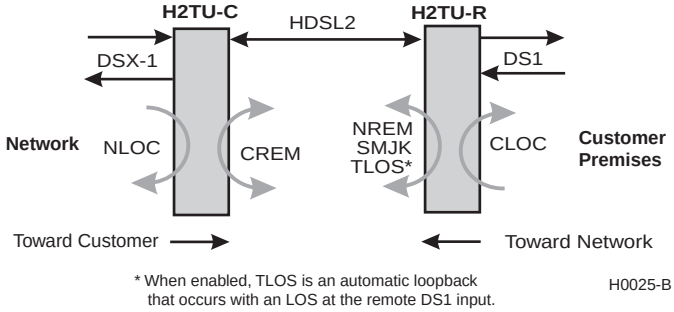
2 Press the first letter of the desired menu. Use the SPACEBAR to cycle through menu selections, and press ENTER to change a setting or to display a menu.

Type the first letter	To view:
Monitor	A graphical representation of circuit activity and devices.
Performance	Performance history statistics (current, 25-hour, 48-hour, 31-day, and blockage indicator) at DS1 and HDSL interfaces. Also, displays alarm status and count.
Event log	Sectionalized Event History for alarms and errors at all four legs of the DS1 signal at the H2TU-R.
Config	Configuration options (standard, ADC, signal generation, date and time, master clear, factory defaults).
Inventory	Product information, circuit and unit identifications.
Rlogon	Maintenance terminal screens at the H2TU-C.
Help	Glossary, screen navigation keys, ADC contact information.
Report	Downloading status and performance monitoring data to file.

For more information about the HDSL2 line unit maintenance screens, refer to the H2TU-C line unit user manual. Copies of ADC line unit user manuals can be downloaded from the ADC website at *www.adc.com*. To order a hard copy, please contact your sales representative.

4 LOOPBACK TESTING

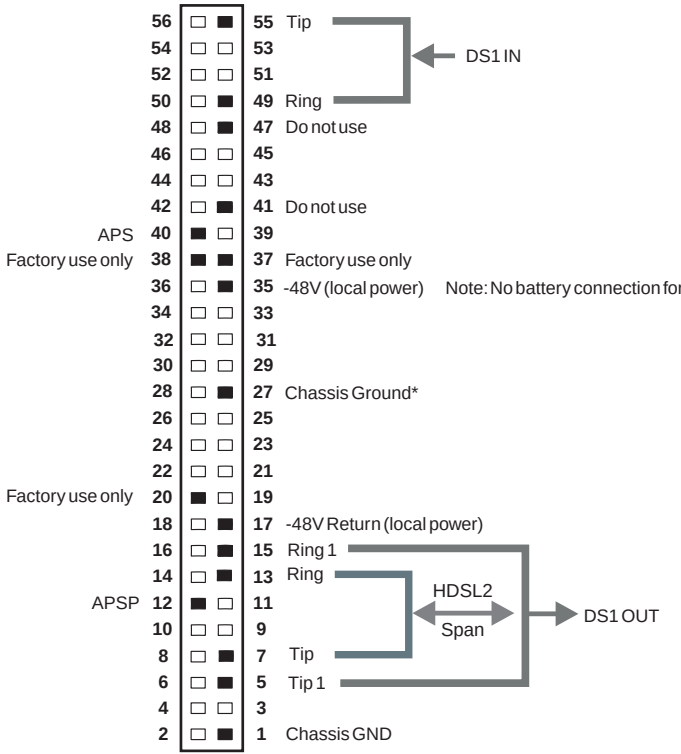
Initiate loopback testing from the maintenance menus, H2TU-R front-panel pushbutton, H2TU-C front-panel pushbuttons, or with inband codes sent by a test set (see table below). For more information about loopback testing, refer to the H2TU-C line unit user manual.



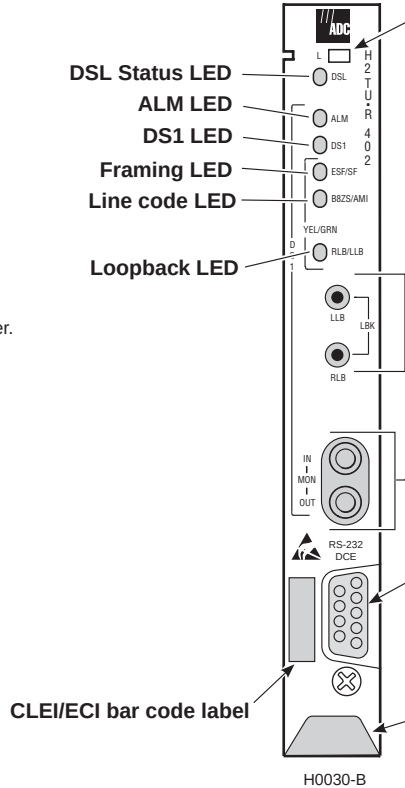
Loopback Commands

Loopback	Inband Code	Description
NLOC	1111000	DSX-1 signal is looped back to the network at the H2TU-C.
NREM	1110000	DSX-1 signal is looped back to the network at the H2TU-R.
SMJK	11000	DSX-1 signal is looped back to the network at the H2TU-R SmartJack module.
CREM	1111110	DS1 signal from customer is looped back to the customer at the H2TU-C.
CLOC	1111100	DS1 signal from customer is looped back to the customer at the H2TU-R.
Loopdown	11100	Deactivates any of the above loopbacks.

Card-edge connector



* Chassis Ground may be tied to Earth Ground according to local practice.



List number

Indicates the list number of the H2TU-R-402.

Loopback control pushbuttons

Press the pushbutton for 5 seconds to activate a dual loopback at the network (RLB) or at the customer (LLB). Any existing loopback is terminated before these loopbacks are activated. The unit can be looped down by pressing either control pushbutton again for 5 seconds, by the standard loopdown inband messages, or by the maintenance terminal.

DS1 input (OUT) and output (IN) monitor (MON) jacks

Provides non-intrusive access monitor to the DS1 signal received from (IN) and transmitted to (OUT) the Customer Premises Equipment (CPE). Allows testing of the HDSL2 system.

Craft port provisioning

To access all system maintenance, provisioning, and performance screens, connect a standard 9-pin terminal cable between the serial port on a PC and the H2TU-R craft port.

Extraction handle

Use to remove the H2TU-R-402 from its slot.

Maintenance Terminal Modem Settings

9600 baud
8 data bits
No parity
1 stop bit
Hardware flow control: OFF
Terminal emulation: VT100

FCC Class A Compliance

This equipment 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

Product warranty is determined by your service agreement. Contact your sales representative or Customer Service for details.

Modifications

Any changes or modifications made to this device that are not expressly approved by ADC DSL Systems, 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

This equipment has been tested and verified to comply with the applicable sections of the following safety standards:

- GR 63-CORE - Network Equipment-Building System (NEBS) Requirements
- GR 1089-CORE - Electromagnetic Compatibility and Electrical Safety
- Binational standard, UL-60950/CSA C22.2 No. 60950-00 Third Edition: Safety of Information Technology Equipment.

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CLEIs: VAR1AATA, VAR110YA
Document: LTPH-QI-1222-01

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