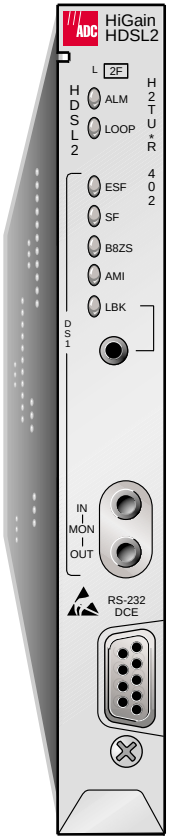
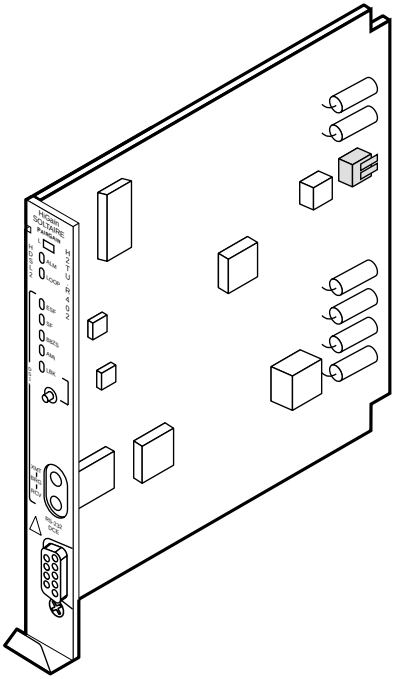
HiGain

QUICK INSTALLATION



H2TU-R-402 LIST 2F REMOTE UNIT

1 INSTALLATION



When installing an H2TU-R, wear an antistatic wrist strap. Avoid touching components on the circuit board.

Align the remote unit with the enclosure slot guides, and push the unit in. The unit will snap into place, indicating that it is properly seated.

Continued

THE H2TU-R-402 LIST 2F

The H2TU-R-402 List 2F functions as the remote end of a repeaterless T1 transmission system when connected to a HiGain HDSL2 line unit (H2TU-C). Setting new standards for interoperability and efficiency, HiGain HDSL2 modules transmit a 1.544 Mbps T1 payload on one unconditioned copper pair over the full Carrier Service Area (CSA) range.

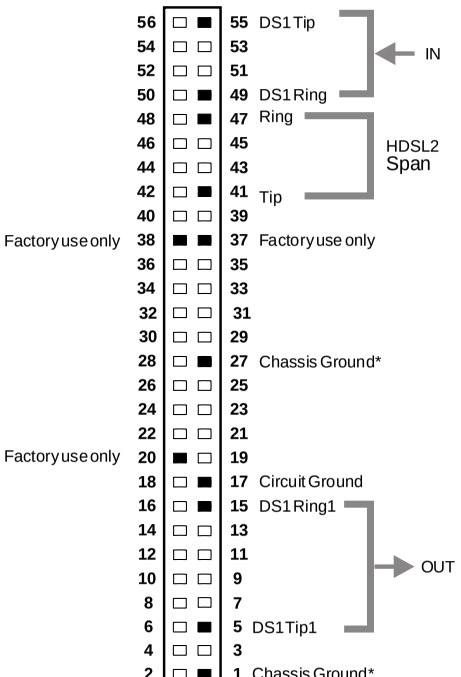
FEATURES

- Status Light Emitting Diodes (LEDs) for Digital Signal Level 1 (DS1) and HDSL2
- Craft port for maintenance terminal connection to access HDSL2 provisioning screens
- DS1 transmit (IN) and receive (OUT) bridging jacks for testing
- Line-powered
- Narrow 200 mechanics
- Flash download of firmware updates
- Ultra-low wander
- Lightning and power cross-protection on HDSL2 and DS1 interfaces
- 1.552 Mbps full-duplex Overlapped PAM Transmission with Interlocking Spectra (OPTIS) HDSL2 transmission on a single pair
- Generic and addressable repeater loopback activation codes
- Remote provisioning
- Transceivers optimize to better adapt to cable impairments

SPECIFICATIONS

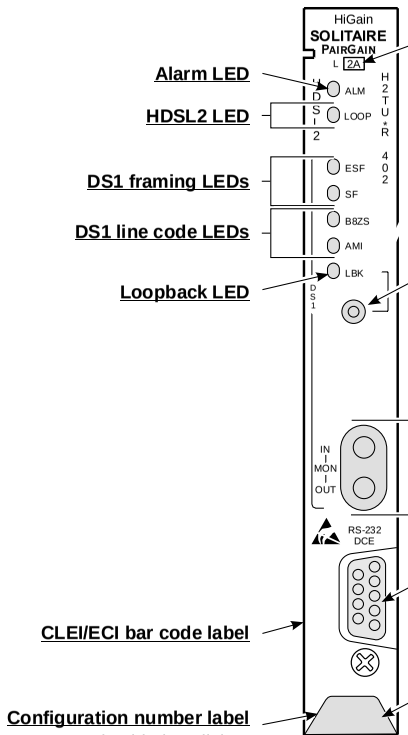
Operating Temperature	-40 °F to +149 °F (-40 °C to + 65 °C)
Operating Humidity	5% to 95% non-condensing
Power Consumption	6 Watts
Electrical Protection	Secondary surge and power cross protection on all DS1 and HDSL2 ports
Mounting	Any 400 or 200 mechanics shelf
HDSL2 Line Rate	1.552 Mbps OPTIS
HDSL2 Output	+16.5 dBm ±0.5 dBm, 135 Ω
DS1 Pulse Output	0 dB, -7.5 dB, -15 dB
Maximum Provisioning Loss	35 dB at 196 KHz, 135 Ω
DS1 Line Rate	1.544 Mbps ±200 bps
DS1 Line Format	AMI or B8ZS
DS1 Frame Format	ESF, SF, or THRU (unframed)

Card-edge connector



Active pins are highlighted in black.

* Chassis Ground may be tied to earth ground according to local practice.



Loopback control button

Pressing the button for 5 seconds activates a remote loopback toward the network called NREM and a local loopback toward the CPE called CLOC. Any existing loopback is terminated before these are activated. The unit can be looped down by either pressing the LPBK control button again for 5 seconds or by the standard loopdown inband commands.

DS1 transmit (IN) and receive (OUT) monitoring jacks

For non-intrusive test access.

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 the remote enclosure.

Modem settings:
9600 baud
8 data bits
No parity
1 stop bit
Hardware flow control: OFF
Terminal emulation: VT-100

2 VERIFICATION

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

Status LED Descriptions

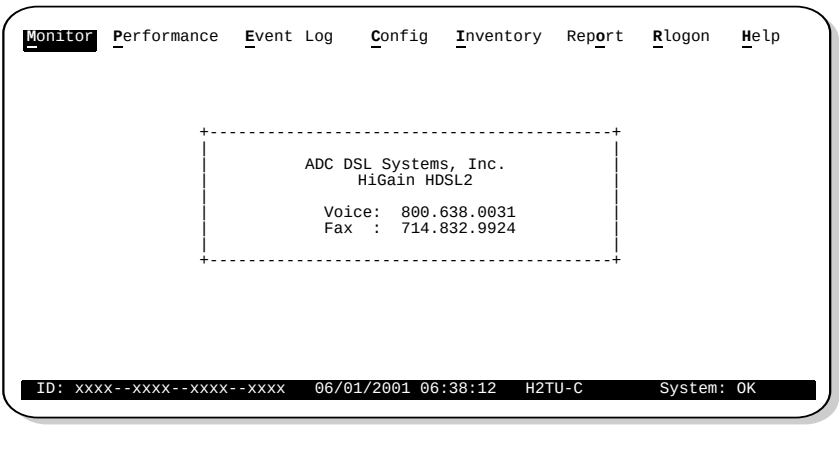
LED Status	Indicates
Alarm (ALM) LED	Shows alarm states for remote and local Loss of Signal (LOS).
Solid red	Indicates a Loss of Signal (LOS) condition at the T1 input of the H2TU-R.
Blinking	Indicates a LOS condition at the T1 input of the H2TU-C line unit.
HDSL2 LED	Displays HDSL2 Loop condition.
Solid green	Indicates HDSL2 loop is in sync.
Blinking once per second	Indicates the HDSL2 loop is trying to acquire sync.
Blinking 4 times per second	Indicates a margin alarm condition on the HDSL2 loop.
Blinking 10 times per second	Indicates a Cyclical Redundancy Check (CRC) error on the HDSL2 loop.
OFF	Indicates no activity on the HDSL2 loop.
DS1 Framing (FRM) LEDs (ESF and SF)	Indicates framing patterns. If DS1 signals are not detected, the ESF, SF, B8ZS, and AMI LEDs will not light.
ESF LED = Solid green	Indicates Extended Super Frame (ESF). The LED blinks once per second when a frame error occurs.
SF LED = Solid green	Indicates Super Frame (SF). The LED blinks once per second when a frame error occurs.
OFF	Indicates unframed or no signal.
DS1 Code LEDs (B8ZS and AMI)	Indicates DS1 code options. If DS1 signals are not detected, the ESF, SF, B8ZS, and AMI LEDs will not light.
B8ZS LED = Solid green	Indicates that the DS1 line code option is set to Bipolar with 8-Zero Substitution (B8ZS). The LED blinks once per second when a string of excessive zeros is detected.
AMI LED = Solid green	Indicates that the user DS1 line code option is set to Alternate Mark Inversion (AMI). This LED blinks once per second when a Bipolar Violation (BPV) is detected.
Loopback (LPBK) LED	Shows loopback states to and from the network and to and from the Customer Interface (CI).
Solid yellow	Indicates Network Remote (NREM), SmartJack (SMJK), or Transmit Loss of Signal (TLOS) loopback.
Blinking once per second	Indicates Customer Local (CLOC) loopback state.
Blinking 4 times per second	Indicates the H2TU-R is in an Armed state.

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.

Use the ←, →, ↑, and ↓ keys to navigate to your selections. Use **SPACEBAR** to cycle through your selections and **ENTER** to activate your choice. **ESC** (or **F11** for VT100) returns you to the main menu. If necessary, press **CTRL** + **R** to refresh.



To log on using a maintenance terminal:

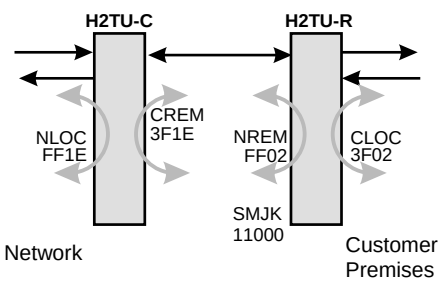
1. Press **CTRL** + **R** to refresh the Logon screen, if necessary.
2. Type **R** to access the maintenance screens.
3. Type the first letter of the desired menu. Use the **SPACEBAR** to cycle through menu selections, and press **ENTER** to change a setting or display a menu.
4. Type **R** to log off.

Type the first letter	To view:
Monitor	A graphical representation of circuit activity and devices.
Performance	Performance history statistics (24-hour, 48-hour, 31-day). Also displays alarm status and count.
Config	Configuration options (standard, ADC, date and time, factory defaults).
Inventory	Product information and circuit and unit identifications.
Rep**O**rt	Provides four types of reports: Full Report, Short Report, System Information Report, and Event Report.
Rlogon	Maintenance terminal screens
Help	Glossary, screen navigation keys, ADC contact information.

For more information about the HDSL2 screens, refer to the appropriate H2TU-C line unit technical practice.

4 LOOPBACK TESTING

Initiate loopback testing from the maintenance terminal menus or by using inband codes. The inband codes shown below can be sent by a test set. For more detailed information, refer to the technical practice for the H2TU-C line unit. It can be downloaded from the ADC web site at www.adc.com.



A3LB Loopback Commands

Loopback	Inband Code	Description
NLOC	1111-1111-0001-1110 (FF1E)	DSX-1 signal is looped back to the network at the H2TU-C.
NREM	1111-1111-0000-0010 (FF02)	DSX-1 signal is looped back to the network at the H2TU-R.
SMJK	1111-1111-0100-1000 (FF48) 100000 11000	DSX-1 signal is looped back to the network at the H2TU-R SmartJack module. (Choose any one of the three inband codes.)
CREM	0011-1111-0001-1110 (3F1E)	Signal from customer is looped back to the customer at the H2TU-C.
CRG1	0011-1111-0000-0100 (3F04)	Signal from customer is looped back to the customer at H2RU1.
CRG2	0011-1111-0000-0110 (3F06)	Signal from customer is looped back to the customer at H2RU2.
CLOC	0011-1111-0000-0010 (3F02)	Signal from customer is looped back to the customer at the H2TU-R.
Loopdown	1111-1111-0010-0100 (FF24) 11100 100	Deactivates any of the above loopbacks.

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.

Safety 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-1950/CSA-C22.2 No. 950-95: Safety of Information Technology Equipment

Trademark Information

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Certificated Firm

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