HiGain

QUICK INSTALLATION

H2TU-R-402 LIST 5C REMOTE UNIT

THE H2TU-R-402 LIST 5C

The HiGain H2TU-R-402 List 5C remote unit is the customer premises side of a repeaterless T1 transmission system. The system provides 1.544 Mbps transmission of a T1 payload on one unconditioned 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 access to HDSL2 provisioning screens
- DS1 transmit (IN) and receive (OUT) bridging test jacks
- Line-powered
- Transceiver optimized to adapt to cable impairments
- Bit Error Rate Tester (BERT)
- 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
- Narrow 200 mechanics
- Ultra-low wander
- Report generation and downloading

SPECIFICATIONS

Operating Temperature	-40°F to +149°F (-40°C to +65°C)
Operating Humidity	5% to 95% (non-condensing)
Line or Local Power Consumption	4.5 W
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 at 135Ω
DS1 Pulse Output	0 dB, -7.5 dB, -15 dB
Maximum Provisioning Loss	35 dB at 196 kHz, 135Ω
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.

Align the H2TU-R with the enclosure slot guides and slide the unit in. Push the unit back until it touches the backplane card-edge connector. The unit should snap into place, indicating that it is properly seated.

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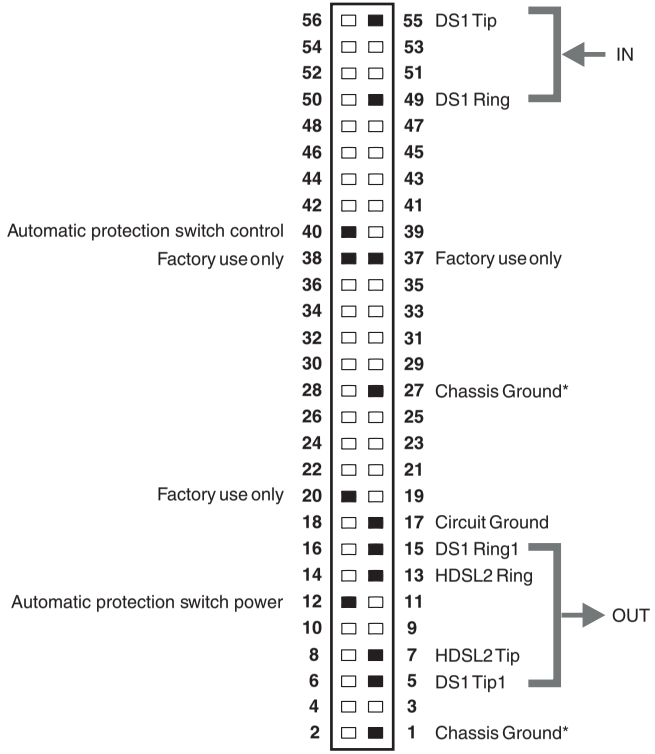
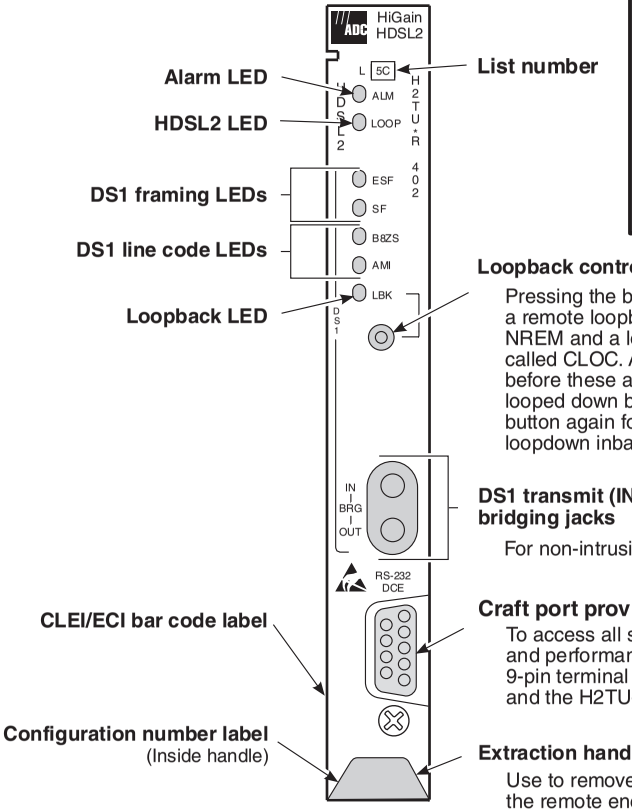
Card-edge connector



Active pins are highlighted in black.

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



Modem settings:

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

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) bridging 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.

2 VERIFICATION

Once the H2TU-R is installed, verify that it is operating properly by monitoring the Status LEDs on the front panel (refer to Table 1).

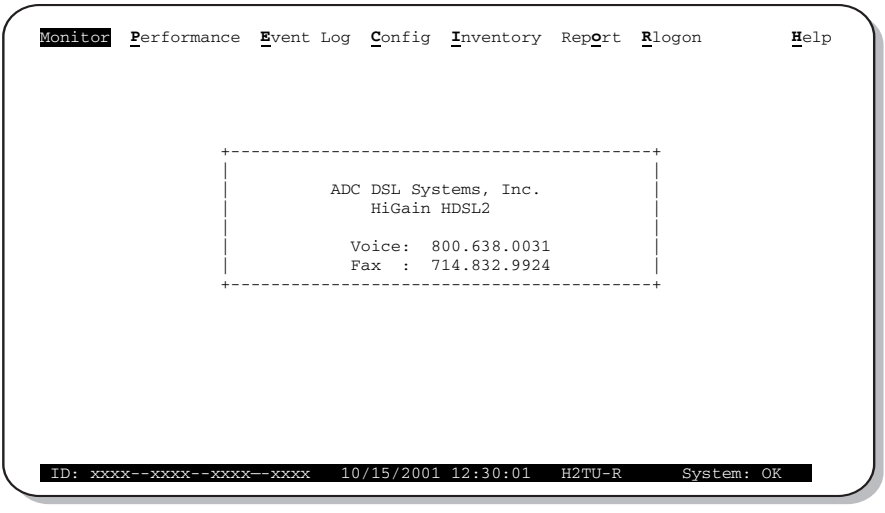
Table 1. *Status LED Descriptions*

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 or CRC 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 Loopback (NREM).
Blinking once per second	Indicates Customer Local Loopback (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 (VT-100 or a PC running VT-100 terminal emulation software) connected to the craft port on the H2TU-R front panel.

The H2TU-R accesses menus and screens that are replications of those viewed at the H2TU-C. You can also view system settings and inventory, initiate loopbacks, monitor performance, and configure the circuit.



To connect a maintenance terminal:

1. Connect a standard 9-pin serial cable to the RS-232 craft port on the H2TU-R front panel. Connect the other end of the cable to the serial port on the maintenance terminal.
2. Configure the maintenance terminal to the communications settings shown in the illustration above.
3. Start a terminal emulation program such as Procomm (emulating a VT100 terminal).
4. If necessary, press CTRL + R to refresh the HiGain HDSL2 logon screen.
5. Type the first letter of the desired menu. Use the SPACEBAR to toggle through menu selections, and press ENTER to change a setting or display a menu.

Type the letter	To view:
Monitor	A graphical representation of circuit activity including loopbacks, alarms, and line code.
Performance	Performance and alarm histories for current, 25-hour, 48-hour, or 31-day periods for DS1 and HDSL2 interface.
Event Log	100 most recent system events with date and time of occurrence.
Config	Menu of standard configuration options, ADC options, and BER tester (BERT) options.
Inventory	Product information and circuit and device identification.
Report	Menu to generate and download reports of system events and performance statistics.
Rlogon/Rlogout	Menus and screens at the H2TU-C. Remote log on can be performed from the H2TU-R or H2TU-C. To log off the H2TU-C, press R. "Rlogout" changes to "Rlogon."
Help	Glossary, a list of navigational keys, and ADC contact information.

Initial provisioning of the HiGain HDSL2 system is performed at the H2TU-C line unit. For more information, refer to the user manual for the H2TU-C line unit (LTPH-UM-1113-xx, including addendum LTPH-AD-1163-xx). It can be downloaded from the ADC website at *www.adc.com*.

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 information, refer to the technical practice for the H2TU-C line unit.

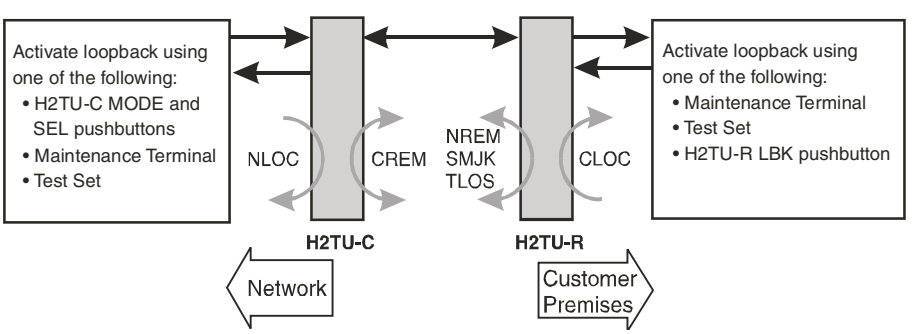


Table 2. *GNLB Loopback Commands*

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	Signal from customer is looped back to the customer at the H2TU-C.
CLOC	1111100	Signal from customer is looped back to the customer at the H2TU-R.
Loopdown	11100	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.

Standards Compliance

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

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