HiGain

QUICK INSTALLATION

H2TU-R-402 LIST 4E
REMOTE UNIT

THE H2TU-R-402 LIST 4E

The ADC® HiGain® HDSL2 product family is the industry's first practical implementation of High bit-rate Digital Subscriber Line 2 (HDSL2). When an H2TU-R-402 List 4E remote unit is used in conjunction with a HiGain line unit (H2TU-C), the system provides 1.552 Mbps transmission on one unconditioned copper pair over the full Carrier Service Area (CSA) range. The CSA includes loops of up to 12,000 feet of 24 AWG or 9,000 feet of 26 AWG wire, including bridged taps. The H2TU-R-402 List 4E may be line or locally powered.

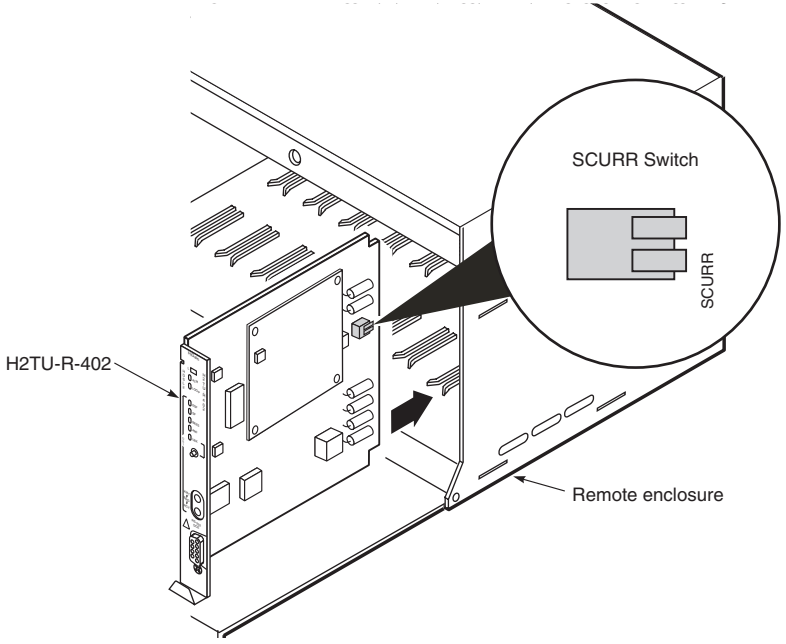
FEATURES

- Front-panel status LEDs and craft port
- Ultra-low wander
- Line or locally powered
- Sealing current option
- Selectable DS1 pre-equalizer
- Metallic loopback self tests
- Loss of Signal (LOS)/Alarm Indication Signal (AIS) payload alarm option
- HiGain maintenance screens for remote provisioning, performance monitoring, inventory and troubleshooting
- Performance Report Messaging (SPRM and NPRM)
- Bit Error Rate (BER) alarm options
- Bipolar Violation Transparency (BPVT) options
- Flash download of firmware updates
- Payload or HiGain loopback source identification
- Generic and addressable repeater loopback activation codes

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	5 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	+16.8 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	Alternate Mark Inversion (AMI) or Bipolar with 8-zero Substitution (B8ZS)
DS1 Frame Format	Extended SuperFrame (ESF), SuperFrame (SF) or Unframed (UNFR)

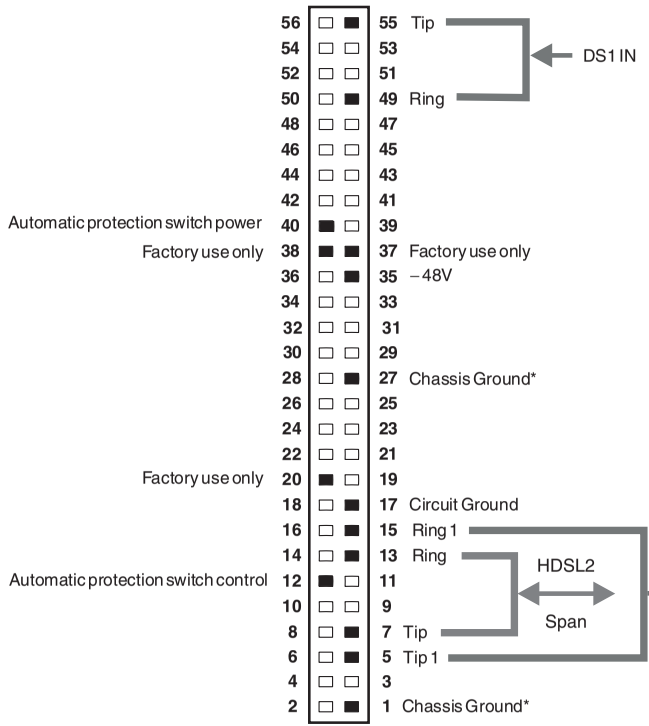
1 INSTALLATION



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

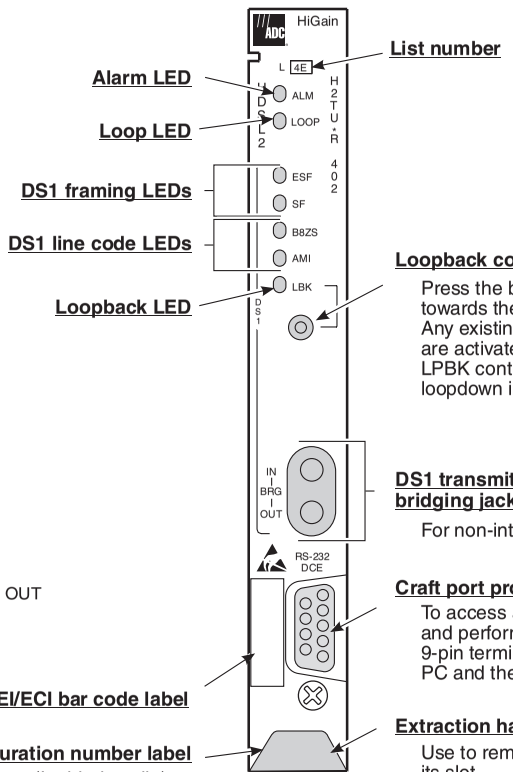
1. Check the setting of the SCURR switch. The default setting is disabled (up position). If the H2TU-R is locally powered, and your application requires sealing current, place the SCURR switch in the down position.
2. Align the H2TU-R with the enclosure slot guides and slide the unit in. Push the unit back until it touches the backplane card-edge connector.
3. Place your thumbs on the front panel and push the H2TU-R into the card-edge connector.

Continued



Active pins are highlighted in black.

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



Alarm LED

Loop LED

DS1 framing LEDs

DS1 line code LEDs

Loopback LED

List number

Maintenance Terminal Modem Settings

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

Loopback control button

Press the button for 5 seconds to activate a loopback towards the network and the customer (NREM and CLOC). Any existing loopback is terminated before these loopbacks are activated. The unit can be looped down by pressing the LPBK control button again for 5 seconds, by the standard loopdown inband messages, or by the maintenance terminal.

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.

CLEI/ECI bar code label

Extraction handle

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

Configuration number label
(Inside handle)

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

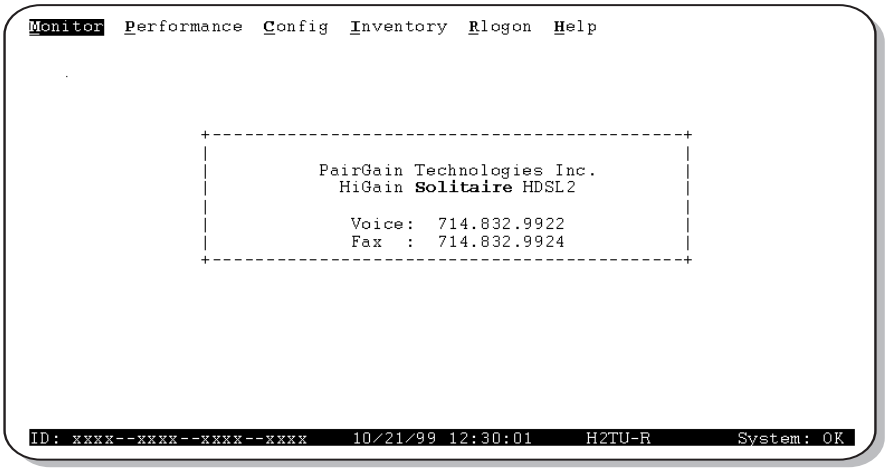
LED Status	Indicates
Alarm (ALM) LED	Shows alarm states for remote and local Loss of Signal (LOS).
Solid red	Indicates a Loss of Signal (LOS) condition at the T1 input of the H2TU-R.
Blinking	Indicates a LOS condition at the T1 input of the H2TU-C line unit.
Loop LED	Displays HDSL2 Loop condition.
Solid 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)	Indications for 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 Line code LEDs (B8ZS and AMI)	Indications for DS1 line 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), SmartJack (SMJK) loopback, or Transmit Loss of Signal (TLOS) loopback.
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.

Copies of this publication can be downloaded from the ADC website at *www.adc.com*. To order a hard copy, please contact your sales representative.

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:

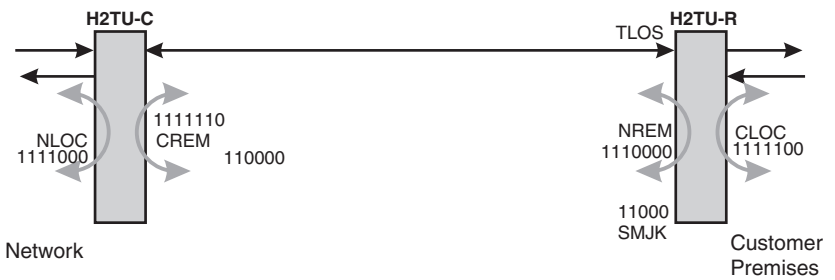
1. Press CTRL + R to refresh the Logon screen, if necessary.
2. Type R to access the maintenance screens.
3. Type the first letter of the desired menu. Use the SPACEBAR to cycle through menu selections, and press ENTER to change a setting or display a menu.
4. Type R to log off.

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.
Rlogon	Maintenance terminal screens
Help	Glossary, screen navigation keys, ADC contact information.

For more detailed information about the HiGain HDSL2 screens, provisioning, flash download of firmware updates, and troubleshooting, download the appropriate H2TU-C line unit user manual 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.



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 commands.)
CREM	0011-1111-0001-1110 (3F1E)	Signal from customer is looped back to the customer at the H2TU-C.
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. (Choose any one of the three commands.)

To comply with the intrabuilding wiring requirements of GR-1089 CORE, Section 4.5.9, the shields of the ABAM-type cables that connect the H2TU-C DSX-1 output ports to the cross-connect panel must be grounded at both ends.

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

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