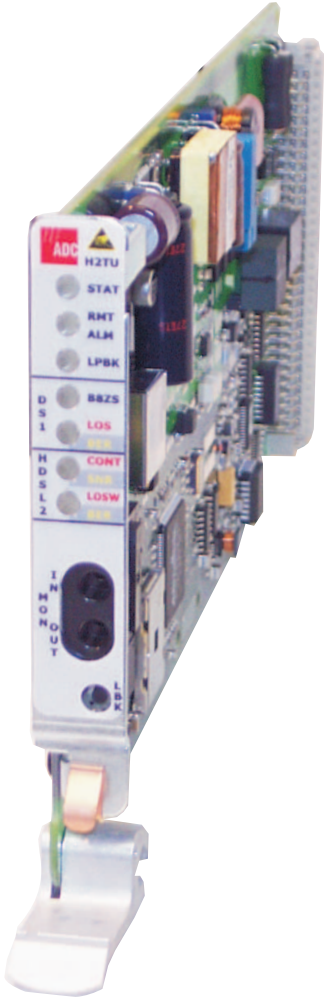


QUICK INSTALLATION



LPS-H2TU-C-L7 LINE CARD

THE LPS-H2TU-C-L7

The LPS-H2TU-C-L7 is a low-power, HDSL2 plug-in line card that installs in a LoopStar™ Chassis, Soneplex® Loop Extender Chassis (LEC), Soneplex Broadband Chassis (BBC), or Soneplex Integrated Broadband Chassis (IBBC). When used in conjunction with an HDSL2 remote unit (H2TU-R-402-L7A), the system provides 1.544 Mbps full-duplex transmission on one unconditioned copper pair over the full Carrier Service Area (CSA) range. The CSA includes loops of up to 12,000 feet on 24 AWG wire or 9,000 feet on 26 AWG wire, including bridged taps.

FEATURES

- 1.544 Mbps full-duplex transmission on one unconditioned copper pair
 - AMI or B8ZS line code detection
 - Status Light Emitting Diodes (LEDs) for Digital Signal Level 1 (DS1) and HDSL2
 - Provides -190 Vdc line power
 - Ground fault detection
 - Supported by Shelf Controller Unit (SCU) software version 3.6.2 or later
 - Dual loopbacks
 - Lightning and power cross-protection on HDSL2 interfaces
 - AUTO, UNFR, SF, or ESF frame format
 - Ultra-low wander (0.26 UI)
-

SPECIFICATIONS

| | |
|-------------------------------------|--|
| Operating Temperature | -40°F to +149°F (-40°C to + 65°C) |
| Operating Humidity | 5% to 95% non-condensing |
| Input Voltage | -48 Vdc nominal (-40 to 57.5 Vdc) |
| Power Consumption | 7.8 Watts |
| Line Power Output | -190 ±8 Vdc |
| Electrical Protection | Secondary surge and power cross-protection on all HDSL2 ports |
| Mounting | LoopStar, Soneplex Loop Extender, Soneplex Broadband Chassis, or Soneplex Integrated Broadband Chassis |
| HDSL2 Line Code | 16 level PAM (OPTIS) |
| HDSL2 Output | +16 dBm ±0.5 dBm, 135Ω |
| HDSL2 Maximum Insertion Loss | 35 dB @ 196 kHz |
| DS1 Equalization | 0 to 655 feet in 133 foot increments |
| DS1 Line Rate | 1.544 Mbps ±200 bps |
| DS1 Line Format | Alternate Mark Inversion (AMI) or Bipolar 8-Zero Substitution (B8ZS) |
| DS1 Frame Format | Extended SuperFrame (ESF), SuperFrame (SF), UNFR, or AUTO (detects and adapts current frame format) |


1 INSTALLATION

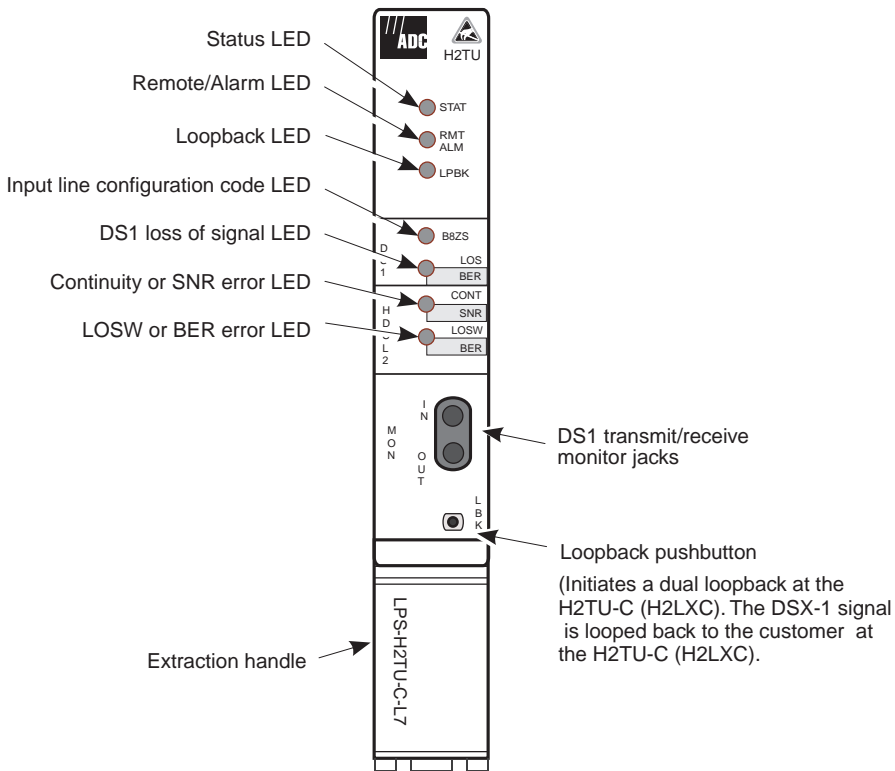
- 1 Align the LPS-H2TU-C with the enclosure slot guides and slide the card in until it touches the backplane connector.
- 2 Raise the extraction lever at the bottom of the front panel to press the card into the backplane connector.

2 POWER-UP SEQUENCE

When the LPS-H2TU-C powers up, the following occurs:

- 1 The STAT LED briefly turns red then yellow, indicating that the power is on and self-test is beginning. The remaining LEDs momentarily turn yellow, then turn off.
- 2 The front-panel LEDs appear as follows upon successful completion of self-test (refer to Table 1):
 - STAT— Displays green
 - RMT ALM—Off
 - LPBK—Off
 - DS1 LOS/BER—Off, red, or yellow (see Table 1 for detailed information).
 - HDLSL2 CONT/SNR—Initially displays red, then Off.
 - HDLSL2 LOSW/BER—Initially displays red, then displays flashing green until loops are synchronized.

Continued 



3 VERIFICATION

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

Table 1. Status LED Descriptions

| LED | Description |
|-----------------------|--|
| Status (STAT) | Displays results of self-test. |
| Red | Internal fault detected during self-test. |
| Yellow | Card is initializing or performing self-test. |
| Green | Normal operation. |
| Off | No power to the CO line card or blown fuse. |
| RMT ALM | Indicates detection of remote alarm. |
| Yellow | Remote alarm detected at the H2TU-R. |
| Off | Normal operation. |
| LPBK | Indicates loopback activity at H2TU-C (H2LXC). |
| Yellow | Flashing: 1 flash per second when armed in intelligent loopback modes. Steady: Active DS1 loopback at any unit in the system. |
| Off | Normal operation. |
| DS1 B8ZS | Indicates input line code configuration. |
| Green | Input code is provisioned for B8ZS. |
| Off | Input code is provisioned for AMI. |
| DS1 LOS/BER | Indicates loss of DS1 input signal (LOS), Bipolar Violation (BPV), or Bit Error Rate (BER) errors at DS1 interface. |
| Red | LOS (DS1 receive signal is lost). |
| Yellow | Brief Flash: Intermittent BPV errors. Steady: BER threshold exceeded at local DS1 interface (default is 10^{-7}) |
| Off | Normal operation. |
| HDSL2 CONT/SNR | Indicates loss of loop continuity or signal-to-noise ratio (SNR) errors. |
| Red | The HDSL2 loop has lost continuity. |
| Yellow | SNR exceeded threshold value at near end of local loop (default is +5 dB). |
| Off | Normal operation. |
| HDSL2 LOSW/BER | Indicates loss of HDSL2 frame synchronization (LOSW), Cyclical Redundancy Check (CRC), or BER errors. |
| Red | HDSL2 LOSW detected. |
| Yellow | Brief Flash: HDSL2 CRC error detected. Steady: BER threshold exceeded on HDSL2 loop, (default is 10^{-7}). |
| Flashing Green | HDSL2 activation in progress. |
| Green | Normal operation. |

4 LOGGING ON TO THE MAIN MENU

The LPS-H2TU-C-L7 supports system logon through a maintenance terminal (VT100 or a PC running VT100 terminal-emulation software) connected to the craft port on the SCU front panel. Once logged on, you can access the Main Menu screens to view local and remote system settings, initiate loopbacks, and provision the circuit.

To log on and access the Main Menu screens using a maintenance terminal:

- 1 Press the **ENTER** key once to display the Logon screen.
- 2 Type the assigned logon ID in the **Enter User Name** field. If you are using SCU v3.6.2 through v4.1, type SONEPLEX . If you are using SCU v5.0, type LOOPSTAR. Press **ENTER** .
- 3 Type the assigned password at the **Enter Password** field. If you are using SCU v3.6.2 through v4.1, type SONEPLEX1 . If you are using SCU v5.0, type LOOPSTAR1.
- 4 Press the **ENTER** key to view the Main Menu screen.



When logging onto the H2TU-R-402-L7A craft port, the LPS-H2TU-C may be labeled as H2TU-C or H2LXC, depending on the system resident at the CO.

5 LOOPBACK TESTING

Initiate loopback testing from the maintenance terminal menus or by using inband codes. The inband codes shown in Table 2 can be sent by a test set. For more detailed information on loopbacks, refer to the user manuals listed in the note below.

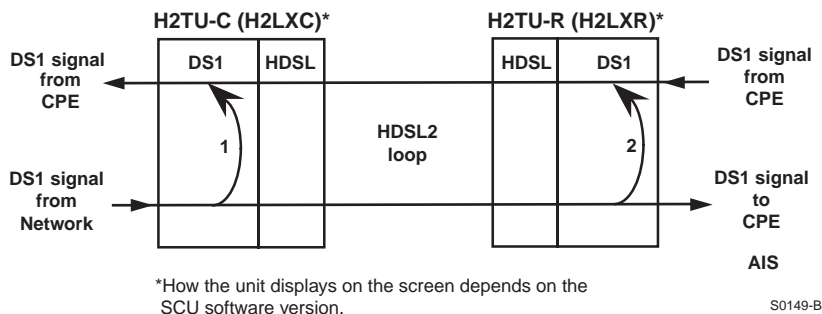


Table 2. Default Codes for Network Programmable Loopback Operations

| Operation | Default Binary Code | Description |
|-------------------------|---------------------|---|
| Loopup H2TU-C/H2LXC (1) | 1101 0011 1101 0011 | The signal is sent inband, activating a loopback at the given unit. Unit goes from Armed to Loopup state. |
| Loopup H2TU-R/H2LXR (2) | 1100 0111 0101 0100 | |
| Loopdown (all units) | 1001 0011 1001 0011 | The signal is sent inband, deactivating the loopback. Unit goes from Loopup state to Armed state. |
| Loopup timeout disable | 1101 0101 1101 0110 | Disables loopup time-out. Loopback stays active until deactivation or disarm code is received. |



The screens viewed from the user interface look different depending on the chassis (LoopStar or Soneplex) into which the LPS-H2TU-C-L7 is installed.

For more detailed information on the LPS-H2TU-C-L7, refer to the following manuals which can be downloaded from the ADC web site at www.adc.com:

LoopStar Systems:

- LPS-H2TU-C-L7 Line Card User Manual for LoopStar Systems (LTPS-UM-8061-xx)
- LoopStar Chassis Installation Manual (LTPS-UM-8048-xx)
- LoopStar Shelf Controller Unit v5.0 User Manual (LTPS-UM-8060-xx)

Soneplex Systems:

- LPS-H2TU-C-L7 Line Card User Manual for Soneplex Systems (LTPS-UM-8057-xx)
- Shelf Controller Unit (v3.6/v3.7) User Manual (LTPS-UM-8024-xx)
- Shelf Controller Unit (v4.0) User Manual (LTPS-UM-8031-01)
- Shelf Controller Unit (v4.1) User Manual (LTPS-UM-8031-02)

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-60950/CSA C22.2 No. 60950-00 Third Edition: Safety of Information Technology Equipment.

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