

QUICK INSTALLATION



LPS-H4TU-C-L5 CO LINE UNIT

LPS-H4TU-C-L5

The LPS-H4TU-C-L5 (LPS-H4TU-C) line unit is the Central Office (CO) side of a T1 transmission system. The LPS-H4TU-C, when used with an H4TU-R-402-5A remote unit, transmits a 1.544 Mbps payload a maximum distance of 12 kft. (26 AWG) over two unconditioned copper pairs. The Carrier Service Area (CSA) range can be extended to a maximum of 34 kft.(26 AWG). (See Compatibility inside.) The LPS-H4TU-C-L5 inter-operates with HiGain HDSL4 repeaters and remotes.

FEATURES

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- 1.544 Mbps full-duplex transmission on two unconditioned copper pairs
 - Status Light Emitting Diodes (LEDs) for Digital Signal Level 1 (DS1) and HDSL4
 - AMI or B8ZS line code detection
 - 34 kft range with two doublers (26 AWG)
 - Lightning and power cross-protection on HDSL4 and DS1 interfaces
 - Supported by Shelf Controller Unit (SCU) software version 4.1 or later ^(a)
 - Remote provisioning of the line through the H4TU-R-402-5A remote unit
 - AUTO, Unframed, SF, or ESF frame format
 - Ultra-low wander
 - Interoperable with HiGain HDSL4 repeaters and remotes
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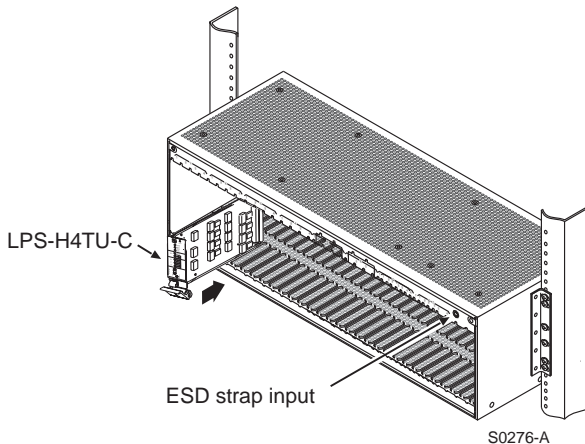
(a) Earlier versions of SCU software can support HDSL4 with limited capabilities (the HDSL4 module is recognized as an HDSL module). Contact the Technical Assistance Center for more information.

SPECIFICATIONS

Operating Temperature	-40°F to +149°F (-40°C to + 65°C)
Operating Humidity	5% to 95% non-condensing
CO Supply	-48 Vdc (nominal)
Power Consumption	32W with two H4D units, 12W without doublers
Line Power Output	33W
Electrical Protection	Secondary surge and power cross-protection on all HDSL4 ports (requires external primary protection)
Mounting	Soneplex Broadband Chassis (BBC), Soneplex Loop Extender Chassis (LEC), or LoopStar
HDSL4 Line Rate	784 kbps 16-TC Pulse Amplitude Modulation (PAM)
HDSL4 Output	+14.1 dBm ±0.5 dBm, 135Ω
DSX-1 Equalization	0 to 655 feet (in 133 foot increments)
Maximum Insertion Loss	Span 1 = 47 dB at 196 kHz Span 2 and Span 3 = 43 dB at 196 kHz
Maximum Loop Attenuation	Span 1 = 31 dB; Span 2 and Span 3 = 29 dB
DSX-1 Line Rate	1.544 Mbps ±200 bps
DSX-1 Line Code	Alternate Mark Inversion (AMI) or Bipolar with 8-Zero Substitution (B8ZS)
DSX-1 Pulse Output	6 V ^{pk-pk} , pre-equalized for 0 to 655 feet of ABAM cable
DSX-1 Input Level	+1.5 dB to 0.0 dB DSX

1

INSTALLATION



- 1 Align the LPS-H4TU-C with the chassis slot guides (Loop Extender chassis, Broadband chassis, or LoopStar) and slide the unit in until it touches the backplane connector.
- 2 Raise the extraction lever at the bottom of the front panel to press the LPS-H4TU-C into the backplane connector.

2

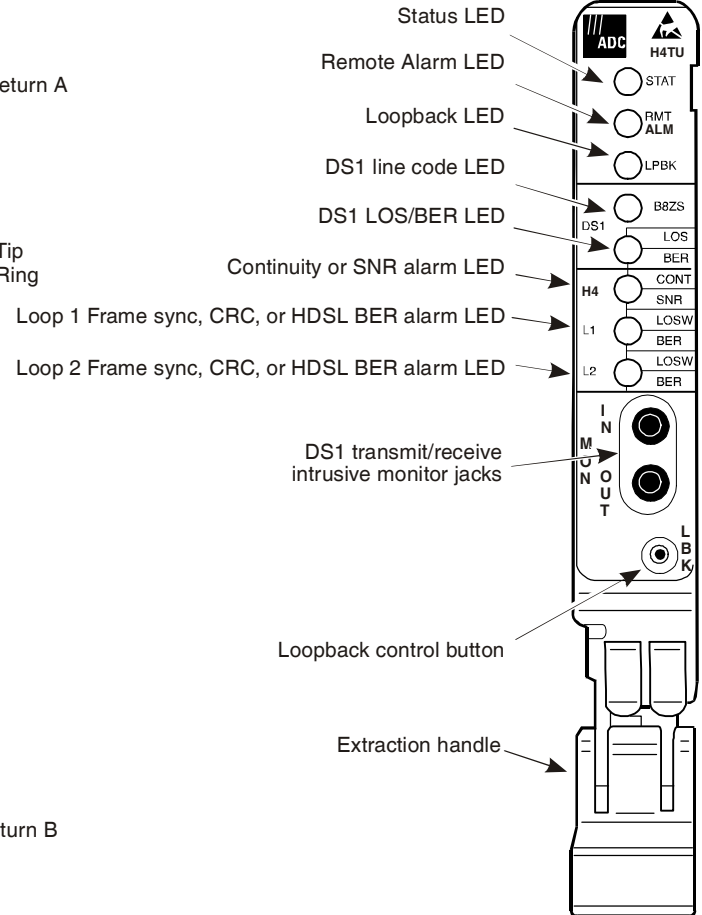
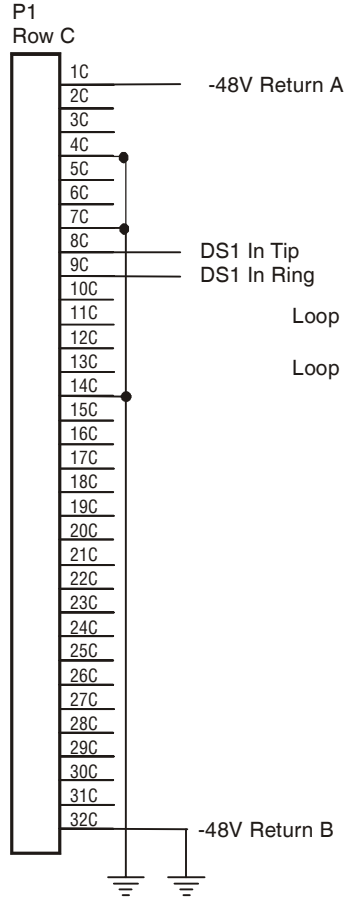
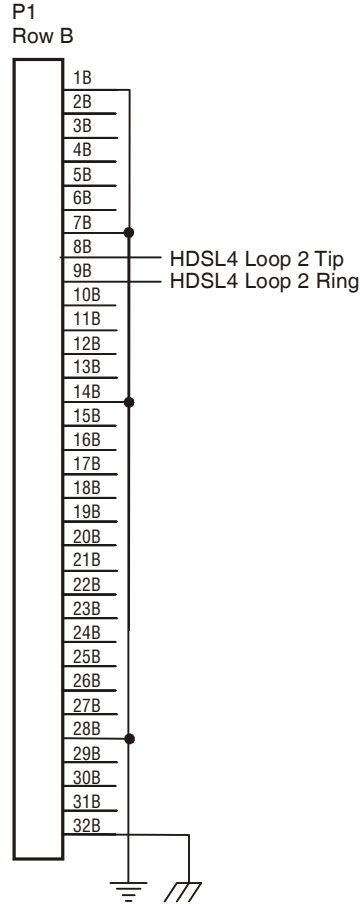
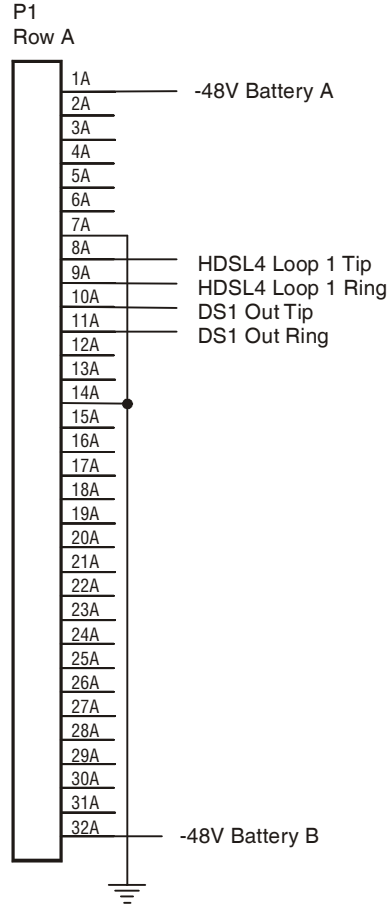
POWER-UP SEQUENCE

When the HDLS4 powers up, the following occurs:

- 1 The STAT LED briefly light red, then yellow, indicating that the power is on and that the self-test diagnostics are beginning. The remaining LEDs momentarily light yellow, then turn off.
- 2 The front-panel LEDs light as follows upon successful completion of the self-test diagnostics:
 - STAT - Green
 - RMT ALM - Off (or yellow when the HDLS4 LOSW/BER LED is red)
 - LPBK - Off
 - DS1 LOS/BER - Off (or red, if DS1 is absent)
 - B8ZS - Off when set to AMI; green when set to B8ZS
 - HDLS4 Loop 1 and Loop 2 - Momentarily solid Red, then flashing green during loop activation, then solid green
- 3 If all LED indicators respond as described, press the LMPTST switch on the APU to verify that all LEDs on the front panel of the line unit light yellow. This indicates that the LEDs are functional.

Continued





3

VERIFICATION

Once the LPS-H4TU-C-L5 is installed, verify that it is operating properly by monitoring the Status LEDs on the front panel.

Table 1. Status LED Descriptions

LED	Description	
STAT	Red	Displays results of self-test diagnostics and initiation status.
	Yellow	Internal fault detected during diagnostics.
	Green	Module is initializing or performing self-test diagnostics.
	Off	Normal operation.
RMT ALM	Yellow	No power to the module or blown fuse.
	Off	Indicates detection of remote alarm. Press the DISP RMT switch on the APU to determine the alarm using the CO unit LEDs.
LBK	Yellow	Remote alarm detected at the H4D or H4TU-R-402-5A unit.
	Off	Normal operation.
DS1 B8ZS	Green	Indicates loopback activity.
	Off	Flashing: 1 flash per second when intelligent loopbacks are Armed. Steady: Active DS1 loopback at the CO unit in the system.
DS1 LOS/BER	Green	Indicates input line code configuration.
	Off	Input code is provisioned for B8ZS.
	Off	Input code is provisioned for AMI.
HDSL4 CONT/SNR	Red	Indicates loss of DS1 signal (LOS), Bipolar Violation (BPV), or bit error rate (BER) errors at DS1 interface.
	Yellow	LOS (DS1 signal is lost).
	Off	Brief Flash: Intermittent BPV errors. Steady: BER threshold exceeded at local DS1 interface (default is DISABLED)
HDSL4 L1 and L2 LOSW/BER	Off	Normal operation.
	Red	Indicates loss of loop continuity or signal-to-noise ratio (SNR) errors.
	Yellow	The HDSL4 loops have lost continuity.
HDSL4 L1 and L2 LOSW/BER	Off	SNR exceeded threshold value at near end of local loop (default is 0 dB).
	Red	Normal operation.
	Off	Indicates loss of HDSL4 frame synchronization (LOSW), Cyclical Redundancy Check (CRC), or BER errors on the indicated loop.
HDSL4 L1 and L2 LOSW/BER	Red	HDSL4 LOSW detected on indicated loop.
	Yellow	Brief Flash: HDSL4 CRC error at near end of local loop. Steady: BER threshold exceeded on indicated HDSL4 loop, (default is DISABLED).
	Green	Flashing: Indicates synchronization is being attempted. Steady: Normal operation.

4

LOGGING ON TO THE MAIN MENU

The LPS-H4TU-C-L5 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, provision the circuits, perform maintenance, and view performance screens.

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

- 1 Press the **ENTER** key twice to display the Logon screen.
- 2 Type the assigned logon ID in the **Enter Username** field. If a logon ID is not assigned, type LOOPSTAR or SONEPLEX (depending on type of system chassis), then press **ENTER**.
- 3 Type the assigned password at the **Enter Password** field. If a password is not assigned, type LOOPSTAR1 or SONEPLEX1.
- 4 Press the **ENTER** key to view the Main Menu screen.

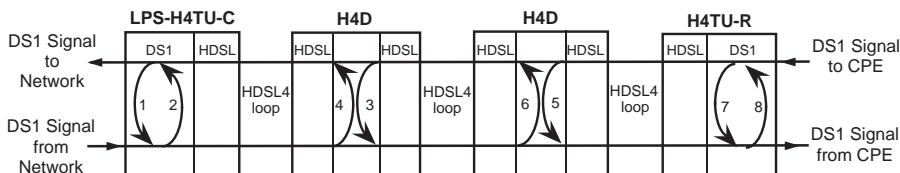


For more detailed information about the maintenance terminal screens, refer to the Soneplex Shelf Controller Unit (SCU) V4.1 User manual (LTPS-UM-8031-xx) and the line LPS-H4TU-C-L5 CO Line Unit User Manual (LTPS-UM-8054-xx).

Copies of this publication or those listed above can be downloaded from the ADC website at www.adc.com. To order printed copies, please contact your sales representative.

5 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 LPS-H4TU-C-L5 User Manual (LTPS-UM-8054-01).



S0274-A

Table 2. Default Codes for Programmable Loopback Operations

Operation	Default Binary Code	Description
Loopup LPS-H4TU-C	1101 0011 1101 0011	The signal is sent inband, activating a loopback at the given unit. Unit goes from Armed to loopup state.
Loopup H4D1	1100 0111 0100 0001	
Loopup H4D2	1100 0111 0101 0100	
Loopup H4TU-R-402-5A	1100 0111 0100 0010	
Loopdown (all units)	1001 0011 1001 0011	The signal is sent inband, deactivating the loopback. Unit goes from loopup state to Armed state.
Loopup time-out disable	1101 0101 1101 0110	Disables loopup time-out. Loopback stays active until deactivation or disarm code is received.

Pressing the CO loopback button for more than 5 seconds will initiate a simultaneous network and customer loopback at the H4TU-R.

COMPATIBILITY

The LPS-H4TU-C is compatible with the H4TU-R-402-5A remote unit and H4D-409-L2 doublers. The table shows the various transmission distances possible with and without doublers. For more information about the remote unit, refer to LTPH-QI-1254-xx; for the doubler unit, refer to LTPH-QI-1120-xx.

Table 3. HDSL4 System Transmission Distances

H4D-409 List 2 Doublers	Maximum Transmission (distance in feet)		
	22 AWG Wire	24 AWG Wire	26 AWG Wire
Number			
0	21,000	16,000	12,000
1	41,600	30,000	23,000
2	62,200	44,000	34,000

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: Safety of Information Technology Equipment

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