

HTU-C LITESPAN (AHT1U)

CLEI: SLL110XH_ _



STATUS LEDS

LOOP	● GREEN	Active loopback toward network
	○ OFF	No loopback toward network
FAIL	● RED	Initializing or unable to operate
	○ OFF	Unit is initialized and working properly
HDSL	● RED	One or both loops are out of synchronization
	● YELLOW	Both loops are synchronized, but there is a yellow or red alarm at the DS1 interface
	○ OFF	Both loops are synchronized and no alarm conditions exist
	○ OFF	Both loops are synchronized and no alarm conditions exist
LP1 / LP2	● GREEN	Good signal quality on loop 1/loop 2
	● YELLOW	Marginal signal quality on loop 1/loop 2
	* FLASHING	Error detected on either end of loop 1/loop 2
	○ OFF	No synchronization between HTU-C and HTU-R on loop 1/loop 2

RS-232 DB-9 CONNECTOR

- Used to access the HDSL utilities menu tree via VT100 emulation software such as Terminal, Hyper Terminal – Private Edition and ProComm Plus.
- Provision terminal port as follows:
 - Data Rate** — 9.6 kbps or 19.2 kbps
 - Asynchronous Data Format** — eight data bits, no parity (none), one stop bit
- When using a PC with terminal software, be sure to disable any power saving programs.



HDSL DEPLOYMENT GUIDELINES

- Cable Pairs must be non-loaded
- Total Bridged Tap < 2.5 kft
- No single Bridged Tap > 2 kft
- 196 kHz insertion loss ≤ 35 dB
- Pulse attenuation (loss on HDSL current system status screen) ≤ 30 dB
- Maximum loop resistance is 130 Ω
- Impulse noise ≤ 50 dBrn as measured using a 50 kb filter
- Wideband noise ≤ 31 dBrn as measured using a 50 kb filter

Caution: If the L6 is used in applications where narrowband and wideband copper service wire pairs are connected simultaneously, only one service pair may have terminating equipment connected to the HTU-C. Also, copper service wire pairs not in use are considered bridged tap to the HDSL loops in service and should be considered in the deployment guidelines. If the bridged tap presented by the unused loop violates the CSA guidelines, the unused pair should be disconnected.

PROVISIONING OPTIONS

(Default settings are indicated in bold typeface)

Line Code

- B8ZS** Provisioned for B8ZS line code
- AMI** Provisioned for AMI line code

Framing

Sets the framing to one of the following options

- AUTO** Unit automatically detects framing
- ESF** Unit set for Extended Superframe format
- SF** Unit set for Superframe format
- UNF** No framing
- FFFC** Forced Framing Format Conversion (ESF to SF)

LBTO (Loopback Time Out)

Sets the time limit after which loopbacks will be automatically looped down

- None** No time limit on loopbacks
- 60 minutes**
- 120 minutes**

DS1 Transmit Level

- 0dB** DS1 Transmit Level
- 15dB** DS1 Transmit Level

Note: This option is set at the HTU-R.

SPWR (Span Power)

- Enabled** Enables -135 Vdc of span power to drive connecting HDSL equipment
- Disabled** Disables -135 Vdc of span power

Single Loop Operation

- Enabled** For single loop operation over one HDSL loop and alarm reporting for that loop
- Disabled** For full T1 operation over both HDSL loops and alarm reporting for both HDSL Loops

Single Loop AIS

- Enabled** AIS is provided to the network when only one HDSL loop is out of synchronization, or when a signal loss is detected at the DS1 interface of the HTU-R. This will block all DS0s while the one loop is out of synchronization
- Disabled** AIS is provided to the network when both HDSL loops are out of synchronization, or when a signal loss is detected at the DS1 interface of the HTU-R.

DS1 Latching Loopback

- T1** Unit does not respond to DDS Latching Loopback codes

- FT1** DDS Latching Loopback operation is supported. The AHT1U and any HRE units in the HDSL circuit are treated as Identical Tandem Dataports and the HTU-R is treated as a different Tandem Data Port

Note: When set for FT1, the CLOS setting is ignored. System will send an FT1 idle signal from the HTU-C to the network consisting of a repeating 7E byte payload.

Customer LOS Response

Sets the unit to respond to a loss of customer signal or receipt of AIS from customer

- AIS** Sends AIS to network upon T1 loss of signal or T1 AIS from customer
- LPBK** HTU-R initiates a network loopback upon T1 loss of signal or T1 AIS from customer
- CDI** HTU-R sends customer disconnect indication upon loss of signal or T1 AIS from customer

WARRANTY

Warranty for Carrier Networks products manufactured by ADTRAN and supplied under Buyer's order for use in the U.S. is ten (10) years. For a complete copy of ADTRAN's U.S. and Canada Carrier Networks Equipment Warranty. (877) 457-5007, Document #414 .

COMPLIANCE CODES

This product is intended to be installed in an enclosure with an Installation Code (IC) of "B" or "E" and in Restricted Access Locations only.

Code	Input	Output
Power Code (PC)	F	C
Telecommunication Code (TC)	-	X
Installation Code (IC)	A	-

CAUTION: Prior to installing or removing the Low Voltage Litespan HTU-C, make sure to observe the following warning: If the Low Voltage Litespan HTU-C is removed from a linecard slot, wait at least 15 seconds before reinsertion. If connected to the MTI craft interface terminal, wait until the message "AID:MJ,UEQ.." appears (where "AID" is the access identifier). This informs the Litespan common control assembly to begin looking for the reinsertion of the linecard. Reinsertion any earlier than this may temporarily lock the HTU-C into a nonfunctional state because the common control assembly will not send the AHT1U equipment type code to the HTU-C linecard.

CONDITION: At Power-Up, all Front Panel Indicators are Off

- SOLUTION:**
1. Verify that the channel bank or ONU BPS power LEDs are on.
 2. Make sure that the unit is fully and correctly inserted into the channel bank or ONU.
 3. If step 1 fails, contact DSC customer service. If step 1 passes, but step 2 fails, replace the HTU-C.

CONDITION: The FAIL LED Remains On

- SOLUTION:**
1. Verify that the channel bank or ONU BPS FAIL LEDs are off.
 2. Verify that the equipment type for the Litespan HTU-C slot is AHT1U. Using TL1, equipment type is shown with the command `rtv-eqpt; AID`, where AID is the access identifier (i.e., `cot-1-15`).
 3. If step 1 fails, contact DSC customer service. If step 1 and step 2 pass, replace the HTU-C. If step 1 passes but step 2 fails, delete the equipment record (i.e., `dlt-eqpt; cot-1-15 with TL1`) and reinsert the card, or equip the slot with the currently reserved equipment type.

CONDITION: The HTU-Rs DS1 LED is Flashing, but No Errors are Indicated by the HTU-C

- SOLUTION:**
1. A BPV, Frame Error (SF), or CRC Error (ESF) has been detected at the DS1 input. This indicates a wiring problem or a B8ZS/AMI mismatch between the HTU-R and the CPE equipment. This is not an indication of problems on the HDSL loops.

CONDITION: The FAIL LED is Off, but the HDSL LED Remains Red

- SOLUTION:**
1. Check that neither HDSL loop is open.
 2. Check that neither or both HDSL loops are shorted.
 3. Verify the loop conforms to CSA guidelines and is not too long. Loop loss at 200 kHz should be less than 35.25 dB.
 4. Verify that both HDSL loops have acceptable noise limits.
 5. Verify that tip and ring of each HDSL loop belongs to the same twisted pair.
 6. If steps 1 through 5 pass, but the HDSL LED remains red, replace the HTU-C.
 7. If step 6 fails, replace the HTU-R and the HRE.

CONDITION: The FAIL LED is Off, but the HDSL LED Remains Yellow

- SOLUTION:**
1. Check that the framing and line coding are set appropriately for T1 data at the HTU-R and for cross-connect T1 data coming to the HTU-C.
 2. Check that the DS1 LED at the HTU-R is green.
 3. If step 1 fails, change the appropriate framing and line coding. If step 1 passes, but step 2 fails, a problem may exist at the HTU-R T1 interface. If the problem does not exist at the T1 interface. Replace the HTU-C.

CONDITION: HDSL LED Yellow, HTU-R DS1 LED Red (Customer Loss of Signal)

- SOLUTION:**
1. To prevent major alarms from being reported in the central office, set the CLOS option to LPBK or CDI.

NOTE: This option is only applicable for software release 7.1.6 and lower.

CONDITION: Running Excessive Errors on the Loop

- SOLUTION:**
1. Measure t-r resistance as described above. If the pairs are unbalanced by more than 4 ohms, or a measurement varies a great deal, this could indicate a high resistance open or an intermittent fault on the loop with the higher measurement. A TDR is typically required to locate this splice for correction.
 2. Excessively long bridged taps can also cause errors. Check the records and/or use a TDR to verify the location and length of bridged taps.
 3. Using ADTRANs "Performance History" screen, it is often possible to see that many more errors are being received on a particular loop or at a particular unit. The fault will typically be very close to the unit receiving the most errors.

CONDITION: The HTU-R has Power, but LP1 or LP2 LEDs are Dark The Unit cannot Sync with the HTU-C

- SOLUTION:**
1. Simplex power for the powering for the HTU-R can be passed over cable pairs that contain load coils or that are too long for HDSL synchronization. Using a TIMS, verify that the circuit is within design limits.
 2. The HTU-R will power-up as long as there is at least one good conductor on each loop. To test, remove the protectors from the MDF and measure t-r resistance to the HTU-R on both loops. The HTU-R will place a 3 ohm short between t-r on both loops. An extremely high impedance indicates an open conductor. An extremely low reading on one loop may indicate a t-r short in the field. In the field, measure t-t and r-r voltage with the HTU-C installed. If these voltages are not present, open pairs or mis-wiring is indicated. As with other circuits, standard resistance measurements between each conductor and ground should also be used to test for a grounded conductor.
 3. A high-resistance open which degrades to the point that it causes the circuit to lose sync can be "resealed" by reseating the HTU-C. Test the cable pairs before reseating the HTU-C.

Turnup Guide

1. Equip COT slot for ADS1U and RT slot for AHT1U.
2. Install ADSIU in COT, AHT1U (HTU-C) in the RT and the HTU-R at the customer premises.
3. Make cross connects between ADSIU and AHT1U.
4. Ensure AHT1U LEDs are as follows:

LOOP	OFF	FAIL	OFF
HDSL	OFF	LP1 / LP2	GREEN
5. Provision cards according to circuit design and specifications.
6. Perform BERT testing.

NOTE: The AHT1U puts out a -135 volts span power. It is capable of powering one repeater and a remote unit.