

HDSL2 H2TU-C

P/N: 1221002L1
CLEI: SLL6211D__



FRONT PANEL LED INDICATORS

- DSL**
 - Green HDSL2 SNR quality is optimum (6 dB or higher)
 - Yellow HDSL2 SNR quality is marginal (1-5 dB)
 - Red HDSL2 SNR quality is poor (0 dB)
 - * Flashing HDSL2 Pulse Attenuation is >30 dB
- STAT**
 - Off Indicates loss of power to the H2TU-R
 - Green Normal operation; HDSL2 synchronized with H2TU-R
 - * Flashing Green Acquiring HDSL2 synchronization with H2TU-R
 - Red Failure indication; unable to start/load firmware
- RLOS**
 - Off DS1 signal from CPE is present at H2TU-R
 - Red DS1 signal from CPE is absent at H2TU-R or framing does not match
- HLOS**
 - Off HDSL2 synchronization achieved
 - Red HDSL2 loss of synchronization
 - * Flashing Red ... DC continuity fault detected on HDSL2 loop
- HCRC**
 - Off No HDSL2 CRC errors within last 30 minutes
 - Yellow Four or more HDSL2 CRC errors in last 30 minutes
 - Red HDSL2 CRC errors are being detected
- ARM/LBK**
 - Off No loopback active
 - Green Loopback is active on this module
 - Yellow Module is armed but loopback is not active
- B8ZS**
 - Off AMI line code
 - Green B8ZS line code

CARD EDGE PINOUT

ADTRAN® uses negative ground-referenced span powering voltage (-190 VDC) on the HDSL2 loop. H2TU-R span powering can be disabled to allow locally powered H2TU-R applications, if desired.

H2TU-C for Litespan plugs directly into a Litespan channel bank assembly channel unit slot. Litespan system software must be version 11.0.0 or higher. The tip and ring connections from the H2TU-C to the shelf are made through card edge pins:

- ◆ Narrowband Tip - Pin A3 ◆ Wideband Tip - Pin C7
- ◆ Narrowband Ring - Pin A4 ◆ Wideband Ring - Pin C8

NOTE: *If the Litespan AHDSL2 is used in applications where narrowband and wideband copper service wire pairs are connected simultaneously, only one service pair can have terminating equipment connected to the H2TU-C. Also, copper service wire pairs not in use are considered as bridge taps to the HDSL2 loop in service and should be entered into the deployment calculations listed in Section 4 of this practice. If the bridged taps presented by the unused loop violates the CSA guidelines, the unused pair should be disconnected.*

CAUTION: *Do not deploy a Litespan AHDSL2 into any Litespan Channel Bank Assembly slot that has ADSL Power Distribution Fuse and Alarm (PDFA) connections to Wideband pairs of the Channel Bank Assembly.*

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INSTALLATION

After unpacking the unit, inspect it for damage. If damage is noted, file a claim with the carrier and then contact ADTRAN. Refer to Warranty.

To install the H2TU-C for Litespan, perform the following steps:

1. If present, remove the Access Module Blank from the appropriate access module slot of the chassis.
2. Pull the ejector latch, located on the lower right-hand side of the H2TU-C for Litespan front panel, from its closed position.
3. Hold the H2TU-C for Litespan by the front panel while supporting the bottom edge of the module with the ejector latch opened to engage the chassis edge. Align the module edges to fit in the lower and upper guide grooves for the access module slot.
4. Slide the module into the access module slot. Simultaneous thumb pressure at the top and at the bottom of the module ensures that the module is firmly positioned against the backplane of the chassis. Secure the module in place by pushing up and in on the ejector latch.

When installed, the H2TU-C for Litespan runs a series of self-tests. Once the self-tests are complete, the status LEDs reflect the true state of the hardware.

TROUBLESHOOTING GUIDE

Condition	Solution
At power up, all front panel indicators are off	<ol style="list-style-type: none"> 1. Verify that the channel bank or ONU BPS power LEDs are on. 2. Make sure that unit is fully and correctly inserted into the channel bank or ONU. 3. If step 1 fails, contact Alcatel customer service (800-848-0333). If step 1 passes, but step 2 fails, replace the H2TU-C.
The STAT LED remains <i>Red</i> .	<ol style="list-style-type: none"> 1. Verify that the channel bank or ONU BPS power LEDs are on. 2. Verify that the equipment type for the Litespan H2TU-C slot is AHDSL2. Using TL1, equipment type is shown with the command rtrv-eqpt::AID, where AID is the access identifier (i.e., cot-1-15). 3. If step 1 fails, contact Alcatel customer service. If step 1 and step 2 pass, replace the H2TU-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.
The STAT LED is off, but the HLOS LED remains <i>Red</i>	<ol style="list-style-type: none"> 1. Confirm that the HDSL2 loop is not open. 2. Confirm that the HDSL2 loop is not shorted. 3. Verify the loop conforms to CSA guidelines and is not too long. Loop loss at 196 kHz should be less than 35 dB. 4. Verify that the HDSL2 loop has acceptable noise limits. 5. Verify that tip and ring of each HDSL2 loop belongs to the same twisted pair. 6. If steps 1 through 5 pass, but the HLOS LED remains red, replace the H2TU-C. 7. If step 6 fails, replace the H2TU-R.
The STAT LED is off, but the RLOS LED remains <i>Red</i> .	<ol style="list-style-type: none"> 1. Check that framing line coding are set appropriately for T1 data at the H2TU-R. 2. Check that the RLOS LED at the H2TU-R is off. 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 H2TU-R T1 interface. If the problem does not exist at the T1 interface, replace the H2TU-C.

Compliance

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



H2TU-C for Litespan Using Narrowband/Wideband Pairs

PRICING AND AVAILABILITY 800.827.0807
 TECH SUPPORT 800.726.8663
 RETURN FOR REPAIR 256.963.8722
 www.adtran.com
 61221002L1-22D

PROVISIONING OPTIONS / LOOPBACK FUNCTIONS

Upon initial insertion of the Litespan H2TU-C into the Litespan system, the H2TU-C is provisioned with the configuration data stored in the shelf controller. The H2TU-C should be pre-provisioned as indicated under “Pre-Configuration Value” in the table below. The loopback function codes are shown at right.

H2TU-C Options	Corresponding Litespan Parameter	H2TU-C Available Setting	Corresponding Litespan Setting	Pre-Configurable Value
Line Code	LINECDE	AMI B8ZS	AMI B8ZS	B8ZS
Framing ¹	FMT	SF ESF Unframed Auto	SF ESF UNFR AUTO	AUTO
NIU Loopback	NIDL PBK	Disabled Enabled	NO YES	YES
Loopback Timeout ¹	LBKTMO	0 20 Minutes 60 Minutes 120 Minutes	0 20 60 120	120
DS1 TX Level	AT	0 -7.5 dB -15 dB	0.0 -7.5 -15	0.0
New England Loopback ^{1,2}	LPBKACTR	Disabled Enabled	0000000000000000 0000000000000001	0000000000000000
Latching Loopback	FT1MODE	T1 FT1	NO YES	NO
Span Power	LP	Disabled Enabled	SINK SOURCE	SOURCE
Customer Loss Indicator ³	LPBKDEACTCDE	AIS AIS/CI Loopback	0000000000000000 0000000000000001 0000000000000010	0000000000000001
PRM Setting	LPBKACTC	None SPRM NPRM Auto (Both)	0000000000000000 0000000000000001 0000000000000010 0000000000000011	0000000000000001
Network Keep Alive	NTWKKPALV	Disabled Enabled	NO YES	NO

1. Some settings may not be available at the H2TU-R.
2. This option is only available if the H2TU-R P/N 1221026L1, 1222026L1, 1223026L1 is used in the circuit.
3. This option is *not* available if the H2TU-R P/N 1221026L1, 1222026L1, 1223026L1 is used in the circuit.

Function/Code	Response
1 in 3 ⁽¹⁾ (100)	Loop down everything
1 in 6 (100000) ⁽¹⁾	If armed, Loops back at the H2TU-R toward the network.
4 in 7 (1111000)	Loops back data from network toward network in the H2TU-C
6 in 7 (1111110)	Loops back data from customer toward customer in H2TU-C
1111 1111 0001 1110	Loops back data from network toward network at H2TU-C (FF1E HEX)
0011 1111 0001 1110	Loopback data from customer toward customer at H2TU-C (3F1E HEX)
Arm / 11000 (known as 2-in-5 pattern) ⁽¹⁾	Loops the H2TU-R toward the network and arms the H2TU-C. No AIS or errors are sent. When sent from the customer, this code arms all modules.
Arm / FF48 ⁽¹⁾ (1111 1111 0100 1000)	This pattern is sent on ESF FDL. When sent from network, all modules are armed and the H2TU-R is looped back toward network. This code has no functionality when sent from the customer.
Disarm / 11100 ⁽¹⁾ (known as 3-in-5 pattern)	All modules are removed from the armed state and looped down when the 11100 pattern is received. The LBK LEDs turn off on all modules.
Disarm / FF24 ⁽¹⁾ (1111 1111 0010 0100)	This pattern is sent on ESF facility data link, and disarms and/or loops down all modules.
H2TU-C Network Loop up / D3D3 ^(1,2) (1101 0011 1101 0011)	If the modules have been armed and no modules are in loopback ⁽⁵⁾ , the H2TU-C loops up toward the network, 2 seconds of AIS (all 1s) are sent, 5 seconds of data pass, and then 231 bit errors are injected into the DSX-1 signal. As long as the pattern continues to be sent, 231 errors are injected every 20 seconds. When the pattern is removed, the module remains in loopback. If the pattern is reinstated, the injection of 231 bit errors resumes at 20-second intervals.
H2TU-R Address 20 for extended demarc / C754 ⁽¹⁾ (1100 0111 0101 0100)	When sent from the network, an H2TU-R network loopback is activated and a 200-bit error confirmation is sent. 2 seconds of AIS (all 1s) is sent, 5 seconds of data pass, and then 200 bit errors are injected into the DSX-1 signal. As long as the pattern continues to be sent, 200 errors are injected every 20 seconds. The HDLSL2 office unit does not block transmission of far-end NIU loopback from the customer premise (H2TU-R).
Loop down / 9393 ^(1,3) (1001 0011 1001 0011)	All modules currently in loopback loop down, but remain in the armed state.
Query Loopback / D5D5 ^(1,2) (1101 0101 1101 0101)	If the modules are armed and the H2TU-C or H2TU-R are in network loopback, errors are injected into the DSX-1 signal upon detection of the query loopback pattern. As long as the pattern continues to be sent, errors are injected again every 20 seconds. The number of errors injected each time depends on which unit is in loopback. 231 errors are injected if the H2TU-C is in network loopback and 20 at a time if the H2TU-R is in network loopback.
Query Loop Parameters / DBDB ⁽²⁾ (1101 1011 1101 1011)	If the units are armed and the H2TU-C is in network loopback, errors are injected into the DSX-1 signal upon detection of the query loop parameters pattern. As long as a pattern continues to be sent, errors are injected again every 20 seconds. The number of errors injected each time depends on the current status of <i>signal quality</i> and pulse attenuation parameters on each loop. 111 errors are injected if all HDLSL2 receiver points (H2TU-C, and H2TU-R) indicate pulse attenuation is 30 dB or lower and signal quality (margin) is 6 dB or higher. 11 errors at a time are injected if any of the receiver points indicate pulse attenuation is greater than 30 dB and/or signal quality (margin) is less than 6 dB.
Loopback Time Out Override / D5D6 ^(1,2,4) (1101 0101 1101 0110)	If the units are armed and this pattern is sent, the loopback time out is disabled. The time out option is updated to NONE on the PROVISIONING menu of the H2TU-R screens (viewable through the RS-232 port). As long as the units remain armed, the time out remains disabled. When the units are disarmed, the loopback time out returns to the value it had before the D5D6 code was sent.
Span Power Disable / 6767 ^(1,2,4) (0110 0111 0110 0111)	If the units are armed and this pattern is sent, the H2TU-C deactivate the span power supply, removing power to the H2TU-R. As long as the pattern continues to be sent, the span power supply remains disabled. When the pattern is discontinued, the H2TU-C reactivates its span power supply, returning power to the remote unit. All units retrain and return to the disarmed and unlooped state.

- Note: All codes listed above must be sent for a minimum of 5 seconds in order for them to be detected and acted upon.
1. The H2TU-C and H2TU-R individually detect and act upon in-band loopback control codes. Depending on which list number of H2TU-R is used with the Litespan H2TU-C, some of these control codes may not cause action (such as loop up, error injection, etc.) at the H2TU-R. Refer to the H2TU-R documentation for supported control codes.
 2. Modules must be armed with 11000b or FF48h for this code to function.
 3. In order to behave like a NIU, the H2TU-R can not loop down from the network side with 9393h.
 4. This code can be detected only if the modules are armed OR if any loopbacks are active.
 5. If NIU is enabled, then the H2TU-R can be in network loopback when the H2TU-C or H2R loop up codes are sent.

Warranty: ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found online at www.adtran.com/warranty.