



Asynchronous H2TU-C Line Cards for Litespan Channel Bank Assemblies Using Narrowband and Wideband Pairs Installation and Maintenance Practice

Document Number: 61221002L1-5F
June 2007

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Revision History

Revision	Date	Description
A	October 2001	Initial release
B	March 2002	Clarifies use of wideband and narrowband cabling pairs
C	June 2003	Provides additional loopback code information and a TL1 tutorial
D	April 2006	Change to CLEI and software; convert to combined practice covering all three technologies
E	July 2006	Change product CLEI codes
F	June 2007	Change product CLEI codes

Conventions

The following typographical conventions are used in this document:

[This font](#) indicates a cross-reference link.

This font indicates screen menus, fields, and parameters.

THIS FONT indicates keyboard keys (ENTER, ESC, ALT). Keys that are to be pressed simultaneously are shown with a plus sign (ALT+X indicates that the ALT key and X key should be pressed at the same time).

This font indicates references to other documentation and is also used for emphasis.

This font indicates on-screen messages and prompts.

This font indicates text to be typed exactly as shown.

This font indicates silk-screen labels or other system label items.

This font is used for strong emphasis.

NOTE

Notes inform the user of additional, but essential, information or features.

CAUTION

Cautions inform the user of potential damage, malfunction, or disruption to equipment, software, or environment.

WARNING

Warnings inform the user of potential bodily pain, injury, or death.

Training

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Asynchronous H2TU-C Line Cards for Litespan Channel Bank Assemblies Using Narrowband and Wideband Pairs

INTRODUCTION

The ADTRAN® Asynchronous H2TU-C Line Cards for Litespan Channel Bank Assemblies Using Narrowband and Wideband Pairs (Litespan H2TU-C) is a DS1 interface line card that provides full T1 service over two-wire interface facilities.

Table 1 lists the three assemblies of the Litespan H2TU-C line cards covered in this practice.

Table 1. ADTRAN Litespan Channel Bank Assemblies

Part Number	Description	CLEI
1221002L1	H2TU-C Line Card for Litespan Using Narrowband/Wideband Pairs	SLL6211D
1221002L2	H2TU-C Line Card for Litespan Using Narrowband Pairs	SLL5R36G *
1221002L3	H2TU-C Line Card for Litespan Using Wideband Pairs	SLL62XYD *

* Changed from previous document release

DESCRIPTION

The Litespan H2TU-C line cards listed in Table 1 are designed to be deployed at Remote Terminal (RT) locations in Alcatel® Litespan® 2000, 2012, and Starspan® systems.

A DS1 circuit is extended to the Litespan H2TU-C at the RT from an Alcatel Central Office Terminal (COT) equipped with an Alcatel ADS1U plug-in.

The Litespan H2TU-C functions as an H2TU-C office repeater in a Litespan RT Channel Bank Assembly. It extends an HDSL2 circuit over the Litespan pairs for distances up to 12,000 feet on the local loop.

Features

The basic features of the Litespan H2TU-C include the following:

- Lightning and power cross-protection static discharge immunity and local power bus fusing for line card safety and protection
- 1.544 kbps HDSL2 transmission over a single pair
- Front panel status LEDs
- Performance monitoring and alarm reporting
- Low power consumption
- Span powering for the ADTRAN HDSL2 remote unit (T200 H2TU-R Transceiver Unit for the Remote End)
- Corrosion-preventive sealing current over a single twisted copper pair
- Troubleshooting functionality

Compatibility

The Litespan H2TU-C can be used in Litespan 2000, Litespan 2012, and Litespan ONU channel bank assembly (CBA) systems that contain Litespan system software versions of 11.0.0 or later.

Each Litespan H2TU-C works with the following multiple list versions of the ADTRAN T200 H2TU-R Transceiver Units for the Remote End (H2TU-R).

Table 2. Compatible Remote Units

Part Number	Description
1222024L6	T200 H2TU-R, Local Power
122x024L7	T200 H2TU-R, Local Power
122x024L9	T200 H2TU-R, Local Power
122x026L9	T200 H2TU-R, Span Power
122x026L1	T200 H2TU-R
122x026L6	T200 H2TU-R MON
1222026L5	T200 H2TU-R B
1222026L7	T200 H2TU-R S

x = any list series

Compliance

Table 3 shows the compliance codes for the Litespan H2TU-C. The Litespan H2TU-C is NRTL listed to the applicable UL standards. Install the Litespan H2TU-C in a restricted access location.

The Litespan H2TU-C provides span-powering voltage, negative only, with respect to ground, –190 VDC nominal, GFI protection < 5 mA), meeting all requirements of Telcordia GR-1089-CORE (Class A2) and ANSI T1.418-2002.

Table 3. Compliance Codes

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

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by ADTRAN could void the user's authority to operate this equipment.

INSTALLATION



After unpacking the Litespan H2TU-C, inspect it for damage. If damage exists, file a claim with the carrier then contact ADTRAN Customer Service. Refer to [“Appendix E, Warranty”](#) for further information. If possible, keep the original shipping container to return the Litespan H2TU-C for repair or for verification of shipping damage.

Shipping Contents

The contents include the following items:

- H2TU-C For Litespan Using Narrowband/Wideband Pairs Line Card
- *H2TU-C For Litespan Using Narrowband/ Wideband Pairs, Job Aid (P/N 61221002Lx-22)*

CAUTION

Electrostatic discharge (ESD) can damage electronic modules. When handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.

Instructions for Installing the Module

Follow the steps below to install the Litespan H2TU-C.

1. If present, remove the Access Module Blank from the appropriate access module slot of the chassis.
2. Pull the ejector latch from its closed position. The latch is located on the lower right-hand side of the Litespan H2TU-C front panel.
3. Hold the Litespan H2TU-C by the front panel while supporting the bottom edge of the module with the ejector latch opened to engage the chassis edge.
4. Align the module edges to fit in the lower and upper guide grooves for the access module slot.
5. 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.
6. Secure the module in place by pushing up and in on the ejector latch.

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

Front Panel LEDs

The Litespan H2TU-C provides front panel LEDs to display status information. [Table 4](#) lists the LEDs and status descriptions.

Table 4. Front Panel LEDs

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

APPLICATIONS

The Litespan H2TU-C can be deployed in circuits consisting of one H2TU-C (line card) and one H2TU-R (remote module). Lightning and power cross-protection is provided at each twisted pair interface of the Litespan H2TU-C. Local power bus fusing protects the Litespan channel bank backplane, Litespan bank power supplies, and neighboring Litespan line cards in the event of catastrophic line card failure.

The Litespan H2TU-C uses a DC-to-DC converter to derive span powering voltage from the Litespan -48 VDC switched battery supply. Simplex current of 30 mA may be coupled onto the HDSL2 loop span to power the H2TU-R (Figure 1). Span powering voltages meet all requirements of Class A2 voltages, as specified by Telcordia GR-1089-CORE.

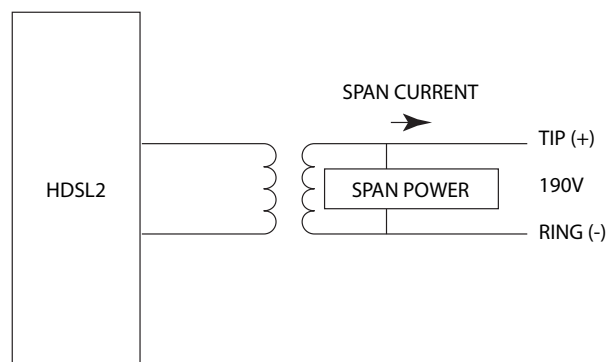


Figure 1. HDSL2 Span Power Diagram

The Litespan H2TU-C provides a cost-effective alternative for deploying T1 service over metallic cable pairs. In contrast with traditional T1 service equipment, the Litespan H2TU-C can successfully deploy over one unconditioned, non-loaded, bridged-tapped copper pair CSA loops (Refer to “Provisioning” on page 9).

Litespan HDSL2 deployment is typically made from a Litespan 2000, Litespan 2012, or Litespan ONU channel bank assembly. Figure 2 shows possible deployments of the Litespan H2TU-C from a Litespan channel bank assembly.

The Litespan H2TU-C can be deployed quickly without the use of expensive T1 repeater equipment on standard CSA loops, while using the existing massive copper-fed twisted line pairs in use by the industry.

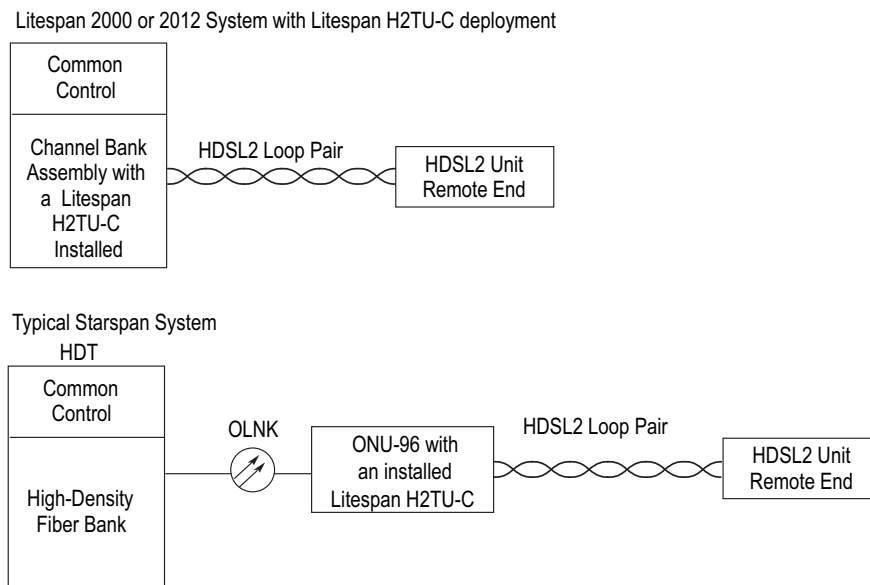


Figure 2. Deployment from a Litespan Channel Bank

The Litespan H2TU-C 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.

Backplane Wiring

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

- 1221002L1 H2TU-C Line Card Using Narrowband/Wideband Pairs
 - Narrowband Tip - Pin A3
 - Narrowband Ring - Pin A4
 - Wideband Tip - Pin C7
 - Wideband Ring - Pin C8
- 1221002L2 H2TU-C Line Card Using Narrowband Pairs
 - Narrowband Tip - Pin A3
 - Narrowband Ring - Pin A4
- 1221002L3 H2TU-C Line Card Using Wideband Pairs
 - Wideband Tip - Pin C7
 - Wideband Ring - Pin C8

NOTE

If using the Litespan H2TU-C in applications where narrowband and wideband copper service wire pairs are connected simultaneously, only one service pair may 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. Enter these into the deployment calculations listed in [“HDSL2 Deployment Guidelines”](#) on page 13. If the bridged taps presented by the unused loop violates the CSA guidelines, disconnect the unused pair.

CAUTION

Do not deploy the Litespan H2TU-C into any Litespan Channel Bank Assembly slot that has ADSL Power Distribution Fuse and Alarm (PDFA) connections to the Wideband pairs of the Channel Bank Assembly.

The Litespan H2TU-C supports narrowband and wideband cabling on the Litespan RT shelf. For more information on cabling, reference Alcatel document OSP 363-305-270.

On insertion of the Litespan H2TU-C, the **STAT** LED should immediately turn red. The **STAT** LED remains red until the Litespan bank recognizes the insertion of the Litespan H2TU-C and downloads the AHDSL2 channel unit type code into the line card. Typically, the **STAT** LED remains red for approximately 15 to 20 seconds (this time may vary). Approximately three to four seconds after the **STAT** LED turns off, the **HLOS** LED turns red; it remains red until the Litespan H2TU-C and H2TU-R synchronize with each other over the HDSL2 loop.

CAUTION

Before installing or removing the Litespan H2TU-C, observe the following: If the Litespan H2TU-C is removed from a line card slot, wait at least 15 seconds before reinsertion. If connected to the MTI craft interface terminal, wait until the message “AID:MJ,UEQ.” appears (“AID” is the access identifier). This informs the Litespan common control assembly that the Litespan H2TU-C has been removed from its slot, after which the common control assembly begins looking for the reinsertion of the line card. Reinsertion any earlier than this may temporarily lock the Litespan H2TU-C into a nonfunctional state because the common control assembly will not send the AHDSL2 equipment type code to the Litespan H2TU-C.

PROVISIONING

[Table 5](#) lists and defines the available provisioning options for the Litespan H2TU-C.

On initial insertion of the Litespan H2TU-C into the Litespan system, the Litespan H2TU-C is provisioned with the configuration data stored in the shelf controller. Provision the Litespan H2TU-C as indicated under “Pre-Configurable Value” in [Table 5](#).

Provisioning of the Litespan H2TU-C is through the craft interface on the MTI card, either via TL1 commands or Litecraft Pro. “[Appendix B, Litespan H2TU-C Provisioning Tutorial](#)” provides TL1 commands for remote provisioning of the Litespan H2TU-C. The provisioning and performance monitoring VT100 terminal screens are viewable from the H2TU-R DB-9 RS-232 craft interface port. However, the provisioning options cannot be changed or manipulated in any way from the H2TU-R.

NOTE

Please reference Alcatel® documentation for detailed information regarding provisioning through the MTI craft interface.

Table 5. HDSL and T1 Provisioning Options

TL1 Commands	H2TU-C Options	Corresponding Litespan Parameter	H2TU-C Available Setting	Corresponding Litespan Setting	Pre-Configurable Value
ED-T1	Line Code	LINECDE	AMI B8ZS	AMI B8ZS	B8ZS
ED-T1	Framing ⁽¹⁾	FMT	SF ESF Unframed Auto	SF ESF UNFR AUTO	AUTO
ED-HDSL	NIU Loopback	NIDLPBK	Disabled Enabled	NO YES	YES
ED-HDSL	Loopback Timeout ⁽¹⁾	LBKTMO	0 20 Minutes 60 Minutes 120 Minutes	0 20 60 120	120
ED-T1	DS1 TX Level	AT	0 -7.5 dB -15 dB	0.0 -7.5 -15	0.0
ED-HDSL	New England Loopback ^(1, 2)	LPBKACTR	Disabled Enabled	0000000000000000 0000000000000001	0000000000000000
ED-HDSL	Latching Loopback	FT1MODE	T1 FT1	NO YES	NO
ED-HDSL	Span Power	LP	Disabled Enabled	SINK SOURCE	SOURCE
ED-HDSL	Customer Loss Indicator ⁽³⁾	LPBKDEACTCDE	AIS AIS/CI Loopback	0000000000000000 0000000000000001 0000000000000010	0000000000000001

Table 5. HDSL and T1 Provisioning Options (Continued)

TL1 Commands	H2TU-C Options	Corresponding Litespan Parameter	H2TU-C Available Setting	Corresponding Litespan Setting	Pre-Configurable Value
ED-HDSL	PRM Setting	LPBKACTC	None	0000000000000000	0000000000000001
			SPRM	0000000000000001	
			NPRM	0000000000000010	
			Auto (Both)	0000000000000011	
ED-HDSL	Network Keep Alive	NTWKKPALV	Disabled	NO	NO
			Enabled	YES	

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.

Table 6. Administrative Commands

TL1 Commands	Description
RMV-HDSL	Removes the Litespan H2TU-C from service (OOS)
RST-HDSL2	Restores the Litespan H2TU-C to service (IS)
ENT-EQPT	Enters or assigns a module to a slot position
DLT-EQPT	Deletes or usassigns a module from a slot position
ED-HDSL or ED-T1	Edits the equipment

Table 7. Maintenance Commands

TL1 Commands	Description
INIT-REG-HDSL or INIT-REG-T1	Clears performance monitoring data and sets all values to zero (0)
RTRV-PM-HDSL or RTRV-PM-T1	Retrieves performance monitoring data
RTRV-ALM-HDSL	Retrieves alarms

Power Requirements

When deploying any of the Litespan H2TU-Cs, the power requirements for the application should also be considered for product mix calculations and maximum number of Litespan H2TU-Cs within a channel bank assembly. Use Worksheet PW-1 in the Engineering and planning section of Alcatel practice, OSP TL1 software documentation release 7.1 or higher, to determine whether a particular combination of channel units is within power-drain specifications. [Table 8](#) lists the ADTRAN Litespan H2TU-C and H2TU-R factors needed to calculate channel bank power using Worksheet PW-1.

Table 8. Worksheet PW-1 Factors

Configuration	A Column Factor	B Column Factor	C Column Factor	D Column Factor
Litespan H2TU-C	NA	NA	NA	0.150 mA

The [Table 8](#) power factors are derived from the power specifications listed in [Table 9](#).

Table 9. Power Specifications for Litespan H2TU-C and H2TU-R

Power Bus	Litespan H2TU-C and H2TU-R
-48 VDC talk battery	0.150 mA
Power consumption	7.2 watts
Power dissipation	4 watts

Alarms

The selectable alarm threshold crossing alerts are as follows:

- SNR margin threshold
- HDSL2 and DS1 15-minute ES, SES, UAS thresholds
- HDSL2 and DS1 Daily ES, SES, UAS thresholds
- HDSL2 loop attenuation threshold
- DS1 15-minute CV-L, B8ZSS-L, and PDVS-L thresholds
- DS1 daily CV-L, B8ZSS-L, and PDVS-L thresholds

Additionally, the H2TU-C provides alarms for the following conditions:

- HDSL2 LOSW alarm
- HDSL2 unit failure alarm
- HDSL2 loop continuity alarms
- HDSL2 circuit reset
- DS1 LOS alarm
- H2TU-R AIS, RAI, INCRAI-CI

HDSL2 DEPLOYMENT GUIDELINES

The ADTRAN HDSL2 technology provides DS1-based services over loops designed to comply with carrier service area (CSA) guidelines. The CSA deployment guidelines are as follows:

1. All loops are nonloaded only.
2. For loops with 26-AWG cable, the maximum loop length including bridged tap lengths is 9 kilofeet.
3. For loops with 24-AWG cable, the maximum loop length including bridged tap lengths is 12 kilofeet.
4. Any single bridged tap is limited to 2 kilofeet.
5. Total bridged tap length is limited to 2.5 kilofeet.
6. The total length of multigauge cable containing 26-AWG cable must not exceed the following:
 - $12 - \{(3 * L_{26}) / (9 - L_{BTAP})\}$ (in kilofeet)
 - L_{26} = Total length of 26-AWG cable excluding bridged taps (in kilofeet)
 - L_{BTAP} = Total length of all bridged taps (in kilofeet)

Figure 3 summarizes these deployment criteria.

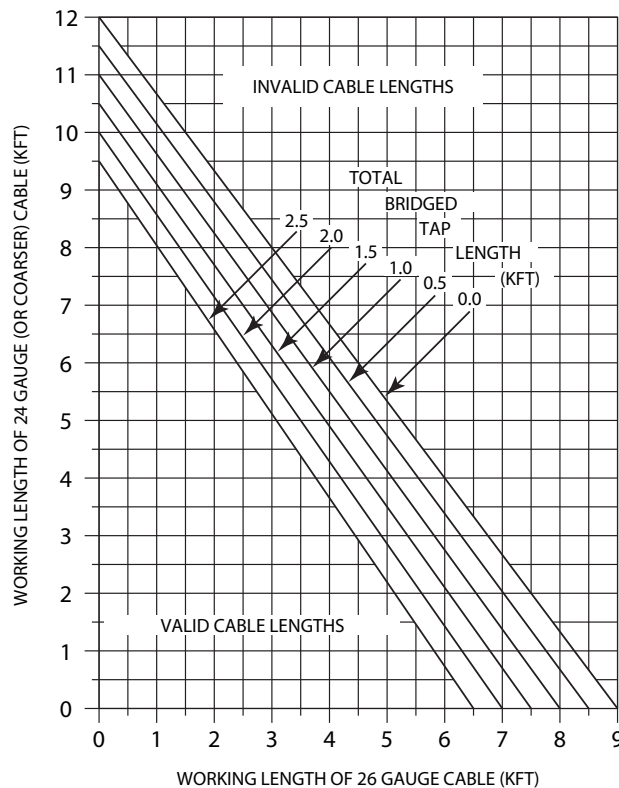


Figure 3. HDSL2 Deployment Guidelines

Table 10 summarizes the loop loss per kilofoot for standard wire gauges.

Table 10. HDSL2 Loss Values

Cable Gauge	Cable Type	Temperature		
		68°F	90°F	120°F
26	PIC	3.902	4.051	4.253
26	Pulp	4.030	4.179	4.381
24	PIC	2.863	2.957	3.083
24	Pulp	3.159	3.257	3.391
22	PIC	2.198	2.255	2.333
22	Pulp	2.483	2.545	2.629
19	PIC	1.551	1.587	1.634
19	Pulp	1.817	1.856	1.909

NOTE

These values are approximate and should be used as guidelines only. Values can vary slightly on different loops. Adhering to the guidelines should produce performance in excess of 10^{-7} BER.

An approximate value for the maximum amount of wideband noise as measured using an F filter on an HDSL2 loop having 35 dB loss is < -47 dBmF.

An approximate value for the maximum level of impulse noise as measured using an F filter on an HDSL2 loop having 35 dB loss is ≤ -38 dBmF.

For additional information on these and other deployment issues, refer to the *Supplemental Deployment Information, HDSL, HDSL2, and HDSL4 (HDSLx) practice* (P/N 61221HDSLL1-10).

TROUBLESHOOTING GUIDE

Table 11. Litespan H2TU-C Troubleshooting Guide

Condition	Solution
At power up, all front panel indicators are <i>off</i>	<ol style="list-style-type: none"> 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 Alcatel customer service at 800-848-0333. If step 1 passes, but step 2 fails, replace the Litespan 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, the equipment type is shown with the command <code>rtrv-eqpt::AID</code>, where AID is the access identifier (i.e., <code>cot-1-15</code>). 3. If step 1 fails, contact Alcatel customer service. If step 1 and step 2 pass, replace the Litespan H2TU-C. If step 1 passes but step 2 fails, delete the equipment record (i.e., <code>dlt-eqpt::cot-1-15</code> with TL1) and reinsert the line card, or equip the slot with the currently reserved equipment type.
The STAT LED is <i>off</i> , 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 Litespan H2TU-C. 7. If step 6 fails, replace the Litespan H2TU-C.
The STAT LED is <i>off</i> , but the RLOS LED remains <i>Red</i> .	<ol style="list-style-type: none"> 1. Check that the framing and 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.

TESTING

“Appendix B, Litespan H2TU-C Provisioning Tutorial” provides the command structure for remote testing of the HDSL2 circuit and associated hardware by using performance monitoring data, loopback commands, and alarm analysis.

MAINTENANCE

The HDSL2 Litespan H2TU-C does not require routine maintenance for normal operation. Do not attempt repairs in the field. Return defective units to ADTRAN to obtain repair services. Refer to the [“Appendix E, Warranty”](#) for further information.

SPECIFICATIONS

Table 12 details the specifications for the Litespan H2TU-C.

Table 12. Specifications

Specification	Description
Loop Interface	
Modulation Type:	16 TCPAM
Mode:	Full duplex, partial overlapped, echo canceling
Number of Pairs:	One
Line Rate:	1.544 Mbps
Baud Rate:	517.333 kbaud
Service Range:	Defined by CSA guidelines
Loop Loss:	35 dB maximum @ 196 kHz
Bridged Taps:	Single Taps < 2 kft, total taps less than 2.5 kft.
Performance:	Compliant with T1.418-2000 (draft)
H2TU-C Transmit Power (Data) Level:	16.6 dBm ± 0.5 dBm (0 kHz to 450 kHz)
H2TU-C Transmit Power (Activation) Level:	16.3 dBm ± 0.5 dBm (0 kHz to 350 kHz)
Input Impedance:	135 Ω
Maximum Loop Resistance:	900 Ω per span
Return Loss:	12 dB (50 kHz to 200 kHz)
Power	
Power Consumption:	48 VDC. 7.2 watts (includes H2TU-C and H2TU-R)
Span Power:	-190 VDC internally generated from the -48 VDC switch battery
Fusing:	-48 VDC (switch battery) is current-limited by a 500 mA Slo-Blo® subminiature surface-mount fuse.
Clock	
Clock Sources:	Internal, DSX-1 derived
Internal Clock Accuracy:	±25 ppm, (exceeds Stratum 4). Meets T1.101 timing requirements

Table 12. Specifications (Continued)

Specification	Description
Tests	
Diagnostics:	Local loopback (H2UT-C), Remote loopback (H2TU-R)
Physical	
Mounting:	Litespan 2000 CBA, Litespan 2012 CBA, or an ONU CBA
Dimensions:	Height: 4.42 inches (11.22 cm) Width: 0.84 inch (2.13 cm) Depth: 10.4 inches (26.4 cm)
Weight:	< 1 pound
Environment	
Temperature:	Operating (standard): -40°C to +70°C Operating (storage): -40°C to +85°C
Humidity:	Up to 95% noncondensing
Compliance	
	Bellcore GR 1089-CORE UL 60950 FCC Class A subpart J DSC requirements for generic subscriber interface unit
Part Number	
H2TU-C for Narrowband/Wideband Pairs:	1221002L1
H2TU-C for Narrowband Pairs:	1221002L2
H2TU-C for Wideband Pairs:	1221002L3

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Appendix A

HDSL2 Loopbacks

HDSL MAINTENANCE MODES

This appendix describes operation of the HDSL2 system with regard to detection of in-band and ESF facility data link loopback codes.

On deactivation of a loopback, the HDSL2 system synchronizes automatically.

Loopback Process Description

In general, the loopback process for the HDSL2 system elements is modeled on the corresponding DS1 system process. Specifically, the H2TU-C loopback is similar to an Intelligent Office Repeater loopback and the H2TU-R loopbacks are similar to a T1 NIU.

The module can detect the loopback activation or deactivation code sequence only if an error rate of 1E-03 or better is present.

Loopback Control Codes

A summary of control sequences is given in [Table A-1](#).

NOTE

In all control code sequences presented, the in-band codes are shown left-most bit transmitted first; the ESF data link codes are shown right-most bit transmitted first.

Table A-1. In-Band Addressable Loopback Codes

Function/Code	Response
1 in 3 (100) ⁽¹⁾	Loop down everything
1 in 6 (100000) ⁽¹⁾	Loopback at the H2TU-R toward the network must be armed before initiated
4 in 7 (1111000)	Loopback data from network toward network in the H2TU-C
6 in 7 (1111110)	Loopback data from customer toward customer in H2TU-C
FF1E (1111 1111 0001 1110)	Loopback data from network toward network at H2TU-C
3F1E (0011 1111 0001 1110)	Loopback data from customer toward customer at H2TU-C
Arm/11000 (also known as a 2-in-5 pattern) ⁽¹⁾	The H2TU-R loops up toward the network. No AIS or errors are sent as a result of this loopback. The H2TU-C arms. When sent from the customer, this code arms all modules.
Arm/FF48 ⁽¹⁾ (1111 1111 0100 1000)	This pattern is sent on ESF facility data link. When sent from the network, all modules are armed and an H2TU-R network loopback is activated. This code has no functionality when sent from the customer.
Disarm/11100 ⁽¹⁾ (also known as a 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 ⁽³⁾ , 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. Two 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 HDSL2 office unit does not block transmission of far-end NIU loopback from the customer premise (H2TU-R).
Loop down/9393 ^(1, 4) (1001 0011 1001 0011)	All modules currently in loopback loop down, but remain in the armed state.

Table A-1. In-Band Addressable Loopback Codes (Continued)

Function/Code	Response
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. <ul style="list-style-type: none"> • 111 errors are injected if all HDSL2 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, 5) (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, 5) (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 1100b or FF48h for this code to function.
3. If NIU is enabled, then the H2TU-R can be in network loopback when the H2TU-C or H2R loop up codes are sent.
4. In order to behave like a NIU, the H2TU-R can not loop down from the network side with 9393h.
5. This code can be detected only if the modules are armed OR if any loopbacks are active.

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Appendix B

Litespan H2TU-C Provisioning Tutorial

GENERAL

This appendix describes the commands necessary to provision the Litespan H2TU-C. A more detailed explanation of shelf-specific items may be found in the *Alcatel Practice for the Litespan Access Platform* (OSP 363-405-000), Volume 6: *TL1 Software Reference*, and Volume 7: *TL1 Messages* (OSP 363-405-502).

This tutorial consists of three sections:

- [“Overview of TL1 Structure”](#) on page B-2
- [“Communication With the Litespan System”](#) on page B-4
- [“Provisioning the Litespan H2TU-C via TL1 Commands”](#) on page B-5

NOTE

The information in this appendix supports Litespan software releases in the 11.0 series. Command parameters described may differ slightly from those in earlier releases of the software. Where differences exist, refer to the appropriate Litespan Standard Practices manual for specific command parameter descriptions.

OVERVIEW OF TL1 STRUCTURE

TL1 commands are used to perform administrative, maintenance, and provisioning tasks on Litespan systems. Commands may be issued from a simple computer terminal (often referred to as a craft interface), by a microcomputer running an appropriate terminal emulation program, or by a higher level system capable of issuing TL1 commands in the proper format (such as a Litecraft PC terminal, AMS, or other operations support system software).

TL1 Command Line Conventions

TL1 command description conventions are as follows:

- TL1 parameters are shown between angle parentheses, as in the example <AID>. This shows the position of a value to be entered or data to be displayed in a retrieve.
- Colons shown between parameters are literal parameter separators; colons must be used between parameter blocks if the string is to be typed out in command line mode.
- Commas are separators between values for similar parameters. Commas must be used between parameter blocks if the string is to be typed out in command line mode.
- The minimum information needed to execute a command is the command name and all required parameters and leading separators, terminated by a semicolon (;). A semicolon is a command line terminator
- Parameters described as not supported are not used, and no value should be entered.
- Parameter values listed as not supported are reserved for future software releases.

Issuing TL1 Commands

TL1 commands may be issued in command line interface (CLI) mode by typing in the complete command string, along with all parameter entries, or by using a system of “menu” displays and option number entries. Menu entry is useful for the user who is learning TL1, and is largely self-explanatory. Direct CLI mode entry is more concise. This tutorial focuses largely on issuing commands through CLI mode.

NOTE

The tables in this appendix provide detailed information on specific TL1 commands. This information includes a description of the path used to access a command via the menu system.

Command Line Interface Mode

A TL1 command can be issued from the (<) prompt by entering the command and all parameter values on one line. This is known as entering a command in CLI mode. The system does not prompt for parameter values in CLI mode; instead, the complete TL1 command string is typed in as it is issued to the Litespan system.

TL1 uses four basic syntactical symbols, as follows:

1. The semicolon (;) is the message terminator. Entry of a semicolon prompts immediate issue of the preceding string for execution.
2. Colons (:) are data block delimiters. They enclose and separate data blocks that are composed of one or more parameters (data units).
3. Commas (,) are parameter delimiters. They enclose and separate parameter fields within data blocks.
4. Double quotes (") enclose formatted text, especially that which is to be passed to multivalent parameter fields (such as CONDREC, the condition record parameter).

In CLI mode, the command code is entered first. Do not press ENTER; enter the command and its parameters all together.

The TL1 command code is followed by its parameter list. Parameters are arranged in blocks, which may consist of one or more parameters, and supply all data necessary for execution. Parameter values must be supplied in the proper order, with each block preceded by a colon (:) and parameters within blocks separated by commas (.). The colon serves to position block values correctly in the command string; even blocks for which no values are required must be indicated with colons, so that the next values are properly positioned. Default values may be accepted by use of a colon without a value.

For command codes followed by the terminator semicolon (;) where no data blocks are entered, default values for parameters are supplied by the system unless parameter entry is required, in which case an error message is displayed.

After entering a command with all the specified options, the system displays the EXECUTE?[NO]= prompt. Enter Y or YES to execute the command. (The default option for the execute command is always negative (NO). Pressing the ENTER key without typing Y or YES does not execute the command.)

COMMUNICATION WITH THE LITESPAN SYSTEM

To communicate with the Litespan system, log on by providing a unique user identification (UID) and private identification (PID, or password) code for verification by the system. In addition, the appropriate security privileges are necessary to perform the desired operations.

Litespan indicates readiness to receive typed command input by displaying a left angle bracket at the far left of the terminal screen or window, followed by the cursor (<_). The left angle bracket is the Litespan prompt.

NOTE

After establishing a connection to the system, it may be necessary to press CTRL+C, followed by a semicolon, to receive a prompt.

Log on to the Litespan System

After connecting a terminal to the Litespan system, the logon prompt “<“ displays. Using your pre-assigned UID and PID, type in the Activate User command line:

```
ACT-USER::<userid>:::<password>;
```

If the logon is successful the user receives the following confirmation message:

```
Litespan2000 02-10-01 09:46:48
M 0 COMPLD
;
<_
```

NOTE

In addition to the M 0 COMPLD message displayed upon logging on the system, Litespan may display automatically-generated reports of alarm conditions or performance monitoring threshold crossings, depending on how such autonomous messages have been provisioned.

Log off the Litespan System

After completing a TL1 session, log off the system. Failure to log off may interfere with other users' access to the Litespan system. To log off, enter the following at the prompt:

```
CANC-USER;
```

If the logon is successful, the user receives the following confirmation message:

```
Litespan2000 02-10-01 09:53:33
M 0 COMPLD
/* TL1 Session Log Out For Node Id: RT User Id : <User ID> */
;
<
```

PROVISIONING THE LITESPAN H2TU-C VIA TL1 COMMANDS

The Litespan H2TU-C is an asynchronous DS1 line card that plugs into the Channel Bank Assembly (CBA) of an Alcatel Litespan-2000 or Litespan-2012 optical loop carrier system.

There must be one ADS1U module in the Central Office Terminal (COT) Litespan CBA for each Litespan H2TU-C installed in the Remote Terminal (RT). Install one ADS1U in the COT (or ensure that one is already installed) for each Litespan H2TU-C to be provisioned.

Perform the following steps to install the Litespan H2TU-C into a Litespan CBA and establish basic provisioning for the T1 facility.

NOTE

TL1 commands are shown here in **BOLD**. Colon and comma sequences must be exact. A semicolon ends the string at any point if the remaining parameters are to be left unchanged or in their default states.

1. Determine if a cross-connect exists for the slot in which the H2TU-C is assigned by entering the following command:

RTRV-CRS-T1 : : <TERMINAL>--<BANK>--<SLOT>;

(See [Table B-1](#) for details on the RTRV-CRS-T1 command.)

2. Does a cross-connect exist on the slot?

If yes, go to Step 3.

If no, go to Step 4.

Table B-1. Retrieve T1 Cross-Connection

Command: RTRV-CRS-T1		
Function:	Retrieves T1 cross-connection data	
Input format:	RTRV-CRS-T1:<TID>:<AID>:<CTAG>:::<PST>,<SST>;	
Example:	RTRV-CRS-T1::COT-1-10;	
Menu Access:	Main Menu → 3. Provisioning Menu → 2. Cross-Connection Menu → 18. RTRV-CRS-T1	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No terminal input required. The default ID is the connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of either end of the cross-connection. Default is ALL
<GB>	General block	Parameter not allowed
<CB>	Common Block	Parameter not allowed
<SB>	Specific Block	Parameter not allowed
<CTAG>	Correlation Tag	No terminal input required. The default is zero (0).
<PST>	Primary service table	Options are ALL, AS, IS, IS-NR, MA, MT, IS-AB, OOS, OOS-MA, OOS-MA-AS, OOS-MA-UAS, OOS-MT, UAS. Default is ALL.
<SST>	Secondary service table	A cross-connection that is redlined (RDLD) cannot be deleted or placed in the OOS-MA state. Entering a cross-connection as RDLD will place both terminating TOs in the RDLD state. Entering a cross-connection as NOT-RDLD will place both terminating T1s in the NOT-RDLD state. Options are RDLD or NOT-RDLD.
System Response:		
/* <number> T1 Cross-Connections Deleted */		

3. Remove the existing cross-connect on the slot; type the following command:

DLT-CRS-T1::<TERMINAL>-<BANK>-<SLOT>;

(See [Table B-2](#) for details on the DLT-CRS-T1 command.)

Table B-2. Delete Cross-Connection

Command: DLT-CRS-T1		
Function:	Removes T1 cross-connections from the database.	
Input format:	DLT-CRS-T1:<TID>:<FROM>,<TO>:<CTAG>;	
Example:	DLT-CRS-T1::RT2-1-12,RT2-1-27;	
Menu Access:	Main Menu → 3. Provisioning Menu → 2. Cross-Connection Menu → 3. DLT-CRS-T1	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<FROM>	From AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection origin. Example: RT2-1-12
<TO>	To AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection destination. Example: RT2-1-27
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<SB>	Specific block	Parameter not allowed.
<PST>	Primary service state	Parameter not allowed.
<SST>	Secondary service state	Parameter not allowed.
System Response:		
/* <number> T1 Cross-Connections Deleted */		

4. Determine whether the slot has previously been assigned to accept a module type other than AHDSL2; type

RTRV-T1::<TERMINAL>-<BANK>-<SLOT>;

(See [Table B-3](#) for details on the RTRV-T1 command.)

5. Is the slot identified with a module type other than AHDSL2?

If yes, go to Step 6.

If no, go to Step 7.

Table B-3. Retrieve T1

Command: RTRV-T1		
Function:	Used to retrieve the service provisioning information for T1 facilities.	
Input format:	RTRV-T1:<TID>:<AID>,<TYPE>:<CTAG>:::<PARAM>:<PST>,<SST>;	
Example:	RTRV-T1::RT-2-15;	
Menu Access:	Main Menu → 3. Provisioning Menu → 15. T1 Provisioning Menu → 8. RTRV-T1	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of T1s to be retrieve.
<TYPE>	Type of unit	Not required.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<PARAM>	Parameters to be retrieved	Not required.
<PST>	Primary service state	Options: IS or OOS. Default = no change.
<SST>	Secondary service state	A channel unit that is redlined (RDLD) cannot be deleted or placed in the OOS-MA state. Options: RDLD or NOT-RDLD.
System Response:		
/* <number> T1 Facilities Retrieved */		

6. Unassign the current module type for the slot; type

DLT-EQPT::<TERMINAL>-<BANK>-<SLOT>;

(See [Table B-4](#) for details on the DLT-EQPT command.)

Table B-4. Delete Equipment

Command: DLT-EQPT		
Function:	Deletes the provisioning information for equipment units.	
Input format:	DLT-EQPT:<TID>:<AID>:<CTAG>;	
Example:	DLT-EQPT::COT-1-ONU1-2;	
Menu Access:	Main Menu → 3. Provisioning Menu → 4. Equipment Provisioning Menu → 1. DLT-EQPT	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of equipment to be deleted. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
System Response:		
/* <number> Equipment Units Deleted */		

7. Remove the previous module from the slot, if present.
8. Insert the H2TU-C into the slot. Litespan automatically installs the line card with default provisioning data stored in the shelf controller.
9. Retrieve the T1s to be cross-connected with the RTRV-T1 command; type
RTRV-T1::<TERMINAL>-<BANK>-<SLOT>&<TERMINAL>-<BANK>-<SLOT>;
(See [Table B-3](#) for details on the RTRV-T1 command.)

An example of this command string is **RTRV-T1::COT-2-15&RT-2-10;**

10. Is the secondary service state (SST) of either T1 UEO-MT?
If yes, go to Step [11](#).
If no, go to Step [12](#).
11. Restore the underlying equipment to service with the RST-EQPT command; type
RST-EQPT::<TERMINAL>-<BANK>-<SLOT>;
12. Is the primary service state (PST) of either T1 OOS-MT (out of service for maintenance)?
If yes, go to Step [13](#).
If no, go to Step [14](#).
13. Restore the T1 facility to service by typing the following RST-T1 command:
RST-T1::<TERMINAL>-<BANK>-<SLOT>;
14. Is the primary service state (PST) of either T1 OOS-MA (out of service for memory administration)?

If yes, go to Step 15.

If no, go to Step 16.

15. Put the T1 facility in service with the Edit T1 command; type

```
ED-T1::<TERMINAL>-<BANK>-<SLOT>:::::IS;
```

(See [Table B-5](#) for details on the ED-T1 command.)

Table B-5. Edit T1

Command: ED-T1		
Function:	Used to modify the provisioning information for T1 facilities.	
Input format:	ED-T1:<TID>:<AID>,<TYPE>:<CTAG>:::<AIS>,<AT>,<CONDREC>,<DETECT>,<EQLZ>,<FMT>,<GOS>,<IGLOC>,<LINECDE>,<LP>,<PTTRN>,<SEQ>,<YEL>:<PST>,<SST>;	
Example:	ED-T1::RT-2-15:::::NONE,15;	
Menu Access:	Main Menu → 3. Provisioning Menu → 15. T1 Provisioning Menu → 4. ED-T1	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	AID of T1 to be edited	Enter <TERMINAL>-<BANK>-<SLOT> of facility to be edited.
<TYPE>	Equipment type	Not required.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<AIS>	Alarm Indication Signal	Options: NONE, ALLZEROS, ALLONES, TR008ALLONES Valid for DS1U, DS1M, T1U, ADS1U, AHT1U, AT1U, HT1U, AHDSL, and AHDXL.
<AT>	Attenuation (in dB)	Options: 0, 7.5, 15, or 22.5. Default = no change Valid for T1U, AT1U, AHT1U, HT1U, AHDSL, and AHDXL.
<CONDREC>	Condition Record	Not required.
<DETECT>	Idle detection	Options: AUTO, YES, and NO. Default = no change. Valid for ADS1U, AT1U, AHDSL, and AHDXL.
<EQLZ>	Equalization, in feet	Not required.
<FMT>	Framing format	Options: CLEAR, ESF, SF, UNFR, AUTO *
<GOS>	AID of GOS table to be used	Enter <Terminal>-GOS<GosNum>. Default = GOS1 Example: RT-GOS1

Table B-5. Edit T1 (Continued)

Command: ED-T1		
<IGLOC>	Interface group location	Not applicable.
<LINECDE>	Line code	Options: AMI, B8ZS, BIT7, AUTO
<LP>	Line Powering	Not required.
<PTTRN>	Idle pattern	The PTTRN field indicates the detectable idle pattern. The values are hex values: 0F, 17, 1B, 77, 7F, 88, 8F, FF. Valid for ADS1U, AT1U, AHDSL, and AHDXL.
<SEQ>	Channel sequence	Not required.
<YEL>	Yellow alarm	The ability to recognize/transmit a yellow signal, and generate a yellow alarm. Options: Yes or No. Valid for T1U, HT1U, DS1U, AHT1U, AHDSL, and AHDXL.
<PST>	Primary service state	No user entry needed. Default = no change.
<SST>	Secondary service state	No user entry needed. Default = no change.
System Response:		
/* <number> T1 Facilities Edited */		

* Facility must be OOS to modify FMT field. Values other than AUTO are valid for DS1U, T1U, HT1U, or DS1M. AUTO is valid only for AHDSL or AHDXL. When CLEAR is used, LINECDE must be AMI.

16. Enter a T1 cross-connection between the H2TU-C and a ADS1U in the CBA by entering the following command:

ENT-CRS-T1::<Node 1 T1 Access ID>,<Node 2 T1 Access ID>;

(See [Table B-6](#) for details on the ENT-CRS-T1 command.)

Table B-6. Enter T1 Cross-Connection

Command: ENT-CRS-T1		
Function:	Adds a T1 cross-connections to the database.	
Input format:	ENT-CRS-T1:<TID>:<FROM>,<TO>:<CTAG>:::<PST>,<SST>;	
Example:	ENT-CRS-T1::COT-1-10,COT-OCE-1-27;	
Menu Access:	Main Menu → 3. Provisioning Menu → 2. Cross-Connection Menu → 12. ENT-CRS-T1	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<FROM>	From AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection origin. Grouping and ranging are supported. Example: RT2-1-12
<TO>	To AID	Enter <TERMINAL>-<BANK>-<SLOT> of the cross-connection destination. If used, the number of circuits specified must equal the number specified by FROM AID. Grouping and ranging are supported. Example: RT2-1-27
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<SB>	Specific block	Parameter not allowed.
<PST>	Primary service table	Options: IS or OOS. Default = no change.
<SST>	Secondary service table	Options: RDLD or NOT-RDLD. Default = no change.
System Response:		
For end-to-end cross-connections:		
<code>"<From AID>,<From-VT AID>,<To-VT AID>,<To AID>"/ * <number> T1 Cross-Connections Entered */</code>		
For half cross-connections:		
<code>"<From AID>,<To AID>"/ * <number> T1 Cross-Connections Entered */</code>		

17. Modify the provisioning data for the H2TU-C to set the Line Code parameter to B8ZS with the following command:

ED-T1::<TERMINAL>-<BANK>-<SLOT>:::LINECDE=B8ZS;

(See [Table B-5](#) for details on the ED-T1 command.)

NOTE

The Litespan H2TU-C ships with a Line Code default of B8ZS; however, the Litespan automatic default assignment changes the Line Code setting to AUTO when the Litespan H2TU-C is installed. To deliver HiCap service, this parameter should be returned to B8ZS.

HDSL PROVISIONING

To modify the provisioning information for HDSL facilities, use the command ED-HDSL. (See [Table B-7](#) for details on this command.)

Table B-7. Edit HDSL

Command: ED-HDSL		
Function:	Used to modify the provisioning information for HDSL facilities.	
Input format:	ED-HDSL : <TID> : <AID> , <TYPE> : <CTAG> :: : <DS0BLK> , <GOS> , <HAIS> , <LP> , <LPBKACTC> , <LPBKACTR> , <LPBKDECTCDE> , <LPBKTMO> , <LPBKTMODEACT> , <NIDL PBK> , <NTWKKPALV> , <PRGMLPBKC> , <PRGMLPBKR> , <SNGLLP> : <PST> , <SST> ;	
Example:	ED-HDSL :: RT-4-21 :: : : , 1 ;	
Menu Access:	Main Menu → 3. Provisioning Menu → 6. HDSL Provisioning Menu → 2. ED-HDSL	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] of facility to be edited. Optional field [-<Locn>-<Loop>] is included in the case of LPBK, PM Commands.
<TYPE>	Equipment type	Options: ALL, AHDSL, AHDXL, or AHDSL2.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<ALMP>	Alarm pattern	Options: AIS, LOS
<DS0BLK>	DS0-level blocking	24-bit field representing the channels to be blocked. Default = no change
<FT1-MODE>	Latching Loopback	Options: NO, YES

Table B-7. Edit HDSL (Continued)

Command: ED-HDSL		
<GOS>	AID of GOS table to be used	<Terminal>-GOS<GosNum>. A GOS table cannot be assigned unless it has already been defined. GOS1 is the system default. Default = no change
<HAIS>	Half AIS	Options: NO, YES. Default = no change. YES = AIS is transmitted when either HDSL loop detects LOSW. NO = AIS is transmitted when both HDSL loops detect LOSW.
<LP>	Line Powering	Options: SOURCE, SINK. Default = no change. SOURCE = Enable line powering, current source. SINK = Disable line powering, current sink.
<LPBK-ACTC>	Loopback activation code, H2TU-C	16-bit code used to activate the inband loopback at the HTU-C. The leftmost bit is the most significant bit (MSB). Default = no change.
<LPBK-ACTR>	Loopback activation code, H2TU-R	16-bit code used to activate the inband loopback at the HTU-R. The leftmost bit is the most significant bit (MSB). Default = no change.
<LPBKDEACTCDE>	Loopback deactivation code	16-bit code used to deactivate the inband loopback. The leftmost bit is the most significant bit (MSB). Default = no change.
<LPBK-TMO>	Loopback time-out period	0, 20, 60, or 120 (minutes). An entry of 0 disables time-out. Default = no change.
<LPBKTMODEACT>	Loopback time-out deactivation code	16-bit code used to disable the inband loopback timer. Default = no change.
<NIDLPBK>	Network interface device loopback	Determines if the HTU-R shall respond to loopback request codes. Options: YES, NO.
<NTWKKPALV>	Network keep-alive	Determines whether the HTU-C will automatically loop back toward the network when it receives LOS or AIS from the HTU-R. Options: YES, NO.
<PRGMLPBKC>	Programmable loopback mode, HTU-C	Options: YES, NO.

Table B-7. Edit HDSL (Continued)

Command: ED-HDSL		
<PRGMLPBKR>	Programmable loopback mode, HTU-R	Options: YES, NO.
<RACIMODE>	Remote Alarm Indication - Customer Installation	Options: YES, NO.
<SNGLLP>	Single loop mode	Options: YES, NO.
<PST>	Primary service table	Options: IS, OOS.
<SST>	Secondary service table	Parameter not allowed.
System Response:		
/* <number> HDSL Facilities Edited */		

Initial HDSL Provisioning

Several HDSL provisioning parameters for the Litespan H2TU-C must be changed from their default settings prior to turning up the circuit. (Refer to [“Provisioning”](#) on page 9 of this document for more information on these command options.)

Using the Edit HDSL command (ED-HDSL), execute the following command string to provide initial HDSL provisioning:

```
ED-HDSL::RT-1-24:::,,,0000000000000001,,0000000000000001,120,,YES;
```

SELECTED TL1 COMMANDS FOR PROVISIONING, MAINTENANCE, AND TESTING

The following commands are used to perform provisioning, maintenance, and testing tasks on T1 and HDSL facilities as they relate to the Litespan H2TU-C. For additional information on these commands, refer to the applicable table associated with a specific command.

Edit T1 Grade of Service

Another aspect of provisioning the Litespan H2TU-C involves the modification of T1 grade-of-service tables to set performance-monitoring threshold levels for various alarm/event conditions. To modify an existing T1 GOS table, use the command ED-GOS-T1. The selection of appropriate parameter options will depend upon the Company-specific requirements.

(See [Table B-8](#) for details on this command.)

Table B-8. Edit T1 Grade of Service

Command: ED-GOS-T1		
Function:	This command Allows modification of grade-of-service tables for T1 facilities. GOS tables allow performance monitoring threshold levels for various alarms/event conditions to be set. Fifteen GOS tables are available for each type of service.	
Input format:	ED-GOS-T1:<TID>:<AID>:<CTAG>:::<MONTYPE>,<THLEV>,<TMPER>;	
Example:	ED-GOS-HDSL::COT-GOS2:::SESL,50,1-HR;	
Menu Access:	Main Menu → 3. Provisioning Menu → 15. T1 Provisioning Menu → 3. ED-GOS-T1	
Note:	Only tables already in the database can be edited. The parameters for only one monitored type are edited each time the command is issued; the remainder of the monitored values are unchanged. To edit the entire GOS table, the ED-GOS command must be issued for each monitored type.	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	AID of GOS table to edit	Enter <Terminal>-GOS<GosNum>.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<MONTYPE>	Monitored parameter type	Used to specify the type of monitored T1 parameter. Options: BERL-L, BERL-P, BERL-H, CSSP, CVL, CVP, ESL, ESP, LASL, SEFSP, SESL, SESP, UASL, UASP, USSL, B8ZSSL, LOSSL, PDVSL, SESCOVSL, SESCOVSP. Default = no change

Table B-8. Edit T1 Grade of Service (Continued)

Command: ED-GOS-T1		
<THLEV>	Threshold level	Each monitored type has its own threshold level. Default = no change.
<TMPER>	Time period	Used to specify the time period for collection of GOS data. Options: 15-MIN, 1-DAY. Default = 15-MIN
<PST>	Primary service state	Parameter not allowed.
<SST>	Secondary service state	Parameter not allowed.
System Response: /* <number> T1 Grade Of Service Tables Edited */		

Initialize T1 Registers

To reset T1 performance-monitoring registers to zero, use the command INIT-REG-T1. The selection of appropriate parameter options will depend upon the Company-specific requirements.

(See [Table B-9](#) for details on this command.)

Table B-9. Initialize T1 Register

Command: INIT-REG-T1		
Function:	Resets the specified performance-monitoring register contents to zero. This command affects only the current state of the register; data recorded for previous time periods is unaffected.	
Input format:	INIT-REG-T1:<TID>:<AID>:<CTAG>::<MONTYPE>,,<LOCN>,,<TMPER>;	
Example:	INIT-REG-T1::COT-1-12:::CVL,,,,1-HR;	
Menu Access:	Main Menu → 2. Maintenance Menu → 20. T1 Maintenance Menu → 5. INIT-REG-T1	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> to identify the facilities for which performance-monitoring registers will be initialized. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.

Table B-9. Initialize T1 Register (Continued)

Command: INIT-REG-T1		
<GB>	General block	Parameter not allowed.
<MONTYPE>	Monitored type	Enter the monitored parameter type to specify the performance-monitoring registers to be initialized. Options: MS, CVL, ESL, LASL, SESL, UASL, USSL, CSSP, CVP, ESP, SEFSP, SESP, UASP, BERL, LOSSL, B8ZSSL, PDVSL or ALL. Default = ALL.
<MONVAL>	Monitored value	Parameter not allowed.
<LOCN>	Location	Options: NEND, FEND NEND (near end) for Network performance-monitoring registers. FEND (far end) for Customer performance-monitoring registers.
<TMPER>	Time period	Enter the time period for which PM registers are initialized. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Parameter not allowed.
<MONTM>	Monitored time	Parameter not allowed.
System Response: /* Registers Initialized On <number> T1 Facilities */		

Retrieve T1 Performance Monitoring

To retrieve performance-monitoring data recorded for a designated T1 facility, use the command RTRV-PM-T1.

(See [Table B-10](#) for details on this command.)

Table B-10. Retrieve T1 Performance Monitoring

Command: RTRV-PM-T1		
Function:	Retrieves performance-monitoring data recorded for the designated T1 facilities.	
Input format:	RTRV-PM-T1:<TID>:<AID>:<CTAG>::<MONTYPE>,<MONLEV>,<LOCN>,<DIRN>,<TMPER>,<MONDAT>,<MONTM>;	
Example:	RTRV-PM-T1::COT-1-13:::CVL,,,1-DAY,7-22,14-00;	
Menu Access:	Main Menu → 2. Maintenance Menu → 20. T1 Maintenance Menu → 15. RTRV-PM-T1	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.

Table B-10. Retrieve T1 Performance Monitoring (Continued)

Command: RTRV-PM-T1		
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> to retrieve performance monitoring data for the facilities specified. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<MONTYPE>	Monitored type	Enter the monitored parameter type for which PM data will be retrieved. Options: MS, CVL, ESL, LASL, SESL, UASL, USSL, CSSP, CVP, ESP, SEFSP, SESP, UASP, BERL, LOSSL, B8ZSSL, PDVSL, or ALL. Default = ALL.
<MONLEV>	Monitored level	Data exceeding the level specified by this field will be retrieved. For example, a value of 4 will retrieve data only for events occurring 4 times or more. Default = 0 (all data retrieved).
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network data. Enter FEND (far end) for Customer data.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Enter the time period for which data is retrieved. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Used to specify the date from which data is retrieved. Enter <MM>-<DD> && <MM>-<DD>. Example <MM> = 1-12, <DD> = 1-31
<MONTM>	Monitored time	Used to specify the time of day for which data is retrieved. Enter <HH>-<MM> && <HH>-<MM>. Example HH = 0-23, <MM> = 0-59.
System Response:		
/* Performance Data On <number> T1 Facilities Retrieved */		

Edit HDSL Grade of Service

To modify the grade-of-service tables for an existing HDSL facility, use the command ED-GOS-HDSL.

(See [Table B-11](#) for details on this command.)

Table B-11. Edit HDSL Grade of Service

Command: ED-GOS-HDSL		
Function:	This command allows modification of grade-of-service tables for HDSL facilities. GOS tables allow performance monitoring threshold levels for various alarms/event conditions to be set. Fifteen GOS tables are available for each type of service.	
Input format:	ED-GOS-HDSL:<TID>:<AID>:<CTAG>:::<MONTYPE>,<THLEV>,<TMPER>;	
Example:	ED-GOS-HDSL::COT-GOS2::::SESCVS,200,15-MIN;	
Menu Access:	Main Menu → 3. Provisioning Menu → 6. HDSL Provisioning Menu → 6. ED-GOS-HDSL	
Note:	Only tables already been entered in the database can be edited. To edit the entire GOS table, the ED-GOS command must be issued for each monitored type. The parameters for only one monitored type are edited each time the command is issued; the remainder of the monitored values are unchanged.	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	AID of GOS table to edit	Enter <Terminal>-GOS<GosNum>.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<CB>	Common block	Parameter not allowed.
<MONTYPE>	Monitored parameter type	Used to specify the type of monitored HDSL parameter. Options: ES, SES, UAS, LA, SESCVS, BER, SNR, LOSWS, CV. Default = no change.
<THLEV>	Threshold level	Each monitored type has its own threshold level. Default = no change.
<TMPER>	Time period	Used to specify the time period for collection of GOS data. Options: 1-DAY, 1-HR, 15-MIN.
<PST>	Primary service state	Parameter not allowed.

Table B-11. Edit HDSL Grade of Service (Continued)

Command: ED-GOS-HDSL		
<SST>	Secondary service state	Parameter not allowed.
System Response:		
/* <number> HDSL Grade Of Service Tables Edited */		

Initialize HDSL Registers

To reset HDSL performance-monitoring registers to zero, use the command INIT-REG-HDSL. (See [Table B-12](#) for details on this command.)

Table B-12. Initialize HDSL Registers

Command: INIT-REG-HDSL		
Function:	This command resets the specified performance-monitoring register contents to zero and affects only the current state of the register; data recorded for previous time periods is unaffected.	
Input format:	INIT-REG-HDSL:<TID>:<AID>:<CTAG>::<MONTYPE>,,<LOCN>,,<TMPER>;	
Example:	INIT-REG-HDSL::<COT-2-4>:::<SNL-R>,,,,<15-MIN>;	
Menu Access:	Not listed in any Litespan menu, but available for execution.	
Note:	The designated HDSL facilities must be in service (IS) prior to initialization.	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> of the DS1U module to which the T1 circuit will be associated. Example: RT-1-35 Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<MONTYPE>	Monitored type	Enter the monitored parameter type to specify the performance-monitoring registers to be initialized. Options: ES, SES, UAS, MS, LOSWS, CV, LA, SNRMIN, or ALL. Default = ALL
<MONVAL>	Monitored value	Parameter not allowed.

Table B-12. Initialize HDSL Registers (Continued)

Command: INIT-REG-HDSL		
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network registers. Enter FEND (far end) for Customer registers.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Enter the time period for registers to be initialized. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Parameter not allowed.
<MONTM>	Monitored time	Parameter not allowed.
System Response: /* Registers Initialized On <number> HDSL Facilities */		

Retrieve HDSL Performance Monitoring

To retrieve HDSL performance-monitoring data, use the command RTRV-PM-HDSL. (See Table [Table B-13](#) for details on this command.)

Table B-13. Retrieve HDSL Performance Monitoring

Command: RTRV-PM-HDSL		
Function:	Retrieves performance-monitoring data recorded for the designated HDSL facilities.	
Input format:	RTRV-PM-HDSL:<TID>:<AID>:<CTAG>::<MONTYPE>,<MONLEV>,<LOCN>,<DIRN>,<TMPER>,<MONDAT>,<MONTM>;	
Example:	RTRV-PM-HDSL::COT-2-11:::SES;	
Menu Access:	Not listed in any Litespan menu, but available for execution.	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT> to retrieve performance monitoring data for the facilities specified. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.

Table B-13. Retrieve HDSL Performance Monitoring (Continued)

Command: RTRV-PM-HDSL		
<MONTYPE>	Monitored type	Enter the monitored parameter type for performance-monitoring data to be retrieved. Options: ES, SES, UAS, MS, LOSWS, CV, LA, SNRMIN, or ALL. Default = ALL.
<MONLEV>	Monitored level	Data exceeding the level specified by this field will be retrieved. For example, a value of 4 will retrieve data only for events occurring 4 times or more. Default = 0 (all data retrieved).
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network data. Enter FEND (far end) for Customer data.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Enter the time period for which data is retrieved. Options: 1-DAY, 1-HR, 15-MIN.
<MONDAT>	Monitored date	Used to specify the date from which data is retrieved. Enter <MM>-<DD> && <MM>-<DD>. Example <MM> = 1-12, <DD> = 1-31
<MONTM>	Monitored time	Used to specify the time of day for which data is retrieved. Enter <HH>-<MM> && <HH>-<MM>. Example <HH> = 0-23, <MM> = 0-59.
System Response: /* Performance Data On <number> HDSL Facilities Retrieved */		

Retrieve HDSL Alarms

To retrieve a list of standing HDSL alarms, use the command RTRV-ALM-HDSL. (See [Table B-14](#) for details on this command.)

Table B-14. Retrieve HDSL Alarms

Command: RTRV-ALM-HDSL	
Function:	Retrieves a list of standing HDSL alarms associated with the designated facilities.
Input format:	RTRV-ALM-HDSL : <TID> : <AID> : <CTAG> : : <NTFCNCDE> , <CONDTYPE> , <SRVEFF> , <LOCN> , <DIRN> , <TMPER> ;
Example:	RTRV-ALM-HDSL : : COT-2-50 : : : MJ , LOS , SA ;

Table B-14. Retrieve HDSL Alarms (Continued)

Command: RTRV-ALM-HDSL		
Menu Access: Main Menu → 2. Maintenance Menu → 6. HDSL Maintenance Menu → 5. RTRV-ALM-HDSL		
Note: Standing alarms are not retrieved for facilities that are out of service for maintenance (OOS-MT).		
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] for a list of standing HDSL alarms (if any) for the facilities specified. Optional field [-<Locn>-<Loop>] is included in the case of LPBK,PM Commands. Default = ALL.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<NTFCNCDE>	Notification code	Used to retrieve a list of the alarms of the severity indicated. Options: CR, MJ, MN, or NR. Default = ALL.
<CONDTYPE>	Condition type	Used to retrieve a list of the alarms of the type indicated. Options: MSGLOST, LOSW, DCCONT, T-SNRL, T-BER, AIS, LOS, OGAIS, T-BERL-L, T-BERL-P, T-BERL-H, PATTERNDETECT, YEL, INCRAI-CI, T-LA. Default = ALL.
<SRVEFF>	Service affect	Used to retrieve a list of the alarms with the service affect indicated. Options: SA, NSA, ALL. Default = ALL.
<LOCN>	Location	Not supported.
<DIRN>	Direction	Not supported.
<TMPER>	Time period	Not supported.
System Response: /* <number> Alarms On <number> HDSL Facilities Retrieved */		

Operate HDSL Loopback

To activate loopback of an HDSL facility, use the command OPR-LPBK-HDSL.

(See [Table B-15](#) for details on this command.)

Table B-15. Operate HDSL Loopback

Command: OPR-LPBK-HDSL		
Function:	Activates loopback of an HDSL facility.	
Input format:	OPR-LPBK-HDSL : <TID> : <AID> : <CTAG> : : : <LOCN> ;	
Example:	OPR-LPBK-HDSL : : RT-3-50-C ;	
Menu Access:	Main Menu → 4. Testing Menu → 1. OPR-LPBK-HDSL	
Note:	Facilities must be placed in the out of service for maintenance (OOS-MT) service state using the RMV-HDSL command.	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] of the HDSL to be placed in loopback. Optional field [-<Locn>-<Loop>] is included in the case of LPBK,PM Commands.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<LOCN>	Location	Options: NEND, FEND Enter NEND (near end) for Network loopback. Enter FEND (far end) for Customer loopback. Default = NEND.
<ORGN>	Origin	Parameter not allowed.
System Response:	/* Loopback on <number> HDSL Facilities Operated */	

Release HDSL Loopback

To deactivate loopback of an HDSL facility, use the command RLS-LPBK-HDSL.
(See [Table B-16](#) for details on this command.)

Table B-16. Release HDSL Loopback

Command: RLS-LPBK-HDSL		
Function:	Deactivates loopback of an HDSL facility.	
Input format:	RLS-LPBK-HDSL:<TID>:<AID>:<CTAG>:::<LOCN>;	
Example:	RLS-LPBK-HDSL::COT-3-50-R:::NEND;	
Menu Access:	Main Menu → 4. Testing Menu → 9. RLS-LPBK-HDSL	
Parameter Usage		
Code	Definition	Description
<TID>	Target ID	No user entry needed. Default = connected terminal.
<AID>	Access ID	Enter <TERMINAL>-<BANK>-<SLOT>[-<Locn>-<Loop>] of the HDSL to be released from loopback. Optional field [-<Locn>-<Loop>] is included in the case of LPBK, PM Commands.
<CTAG>	Correlation tag	No user entry needed. Default = 0.
<GB>	General block	Parameter not allowed.
<LOCN>	Location	Options: ALL, FEND, NEND or LINE.
<ORGN>	Origin	Parameter not allowed.
System Response:		
/* Loop Back on <number> HDSL Facilities Released */		

Appendix C

Metallic Access Unit Testing Capabilities

INTRODUCTION

This appendix describes the testing functionality available for the Litespan H2TU-C via the MTAU unit. For a complete description of the MTAU unit, refer to Alcatel document Common Equipment Unit Descriptions, OSP 363-405-250.

NOTE

The functionality of the SPLIT and MON features detailed in this document supersedes that shown in the OSP 363-405-250.

INITIATING MTAU TEST ACCESS

CONN-JACK-T1

The Connect T1 Jack command connects a T1 or HDSL facility to the MTAU via the channel bank test bus.

Input Format:

CONN-JACK-T1:<TID>:<AID>:<CTAG>::<MD>;

AID = Access ID of the unit to be connected to the MTAU

MD = Mode (SPLIT or MON)

Example: CONN-JACK-T1::COT-1-15::SPLIT;

NOTE

To use SPLIT mode, a facility must be out of service for maintenance or out of service for memory administration.

Diagrams of the functionality of the two test access modes are shown in [Figure C-1](#) and [Figure C-2](#).

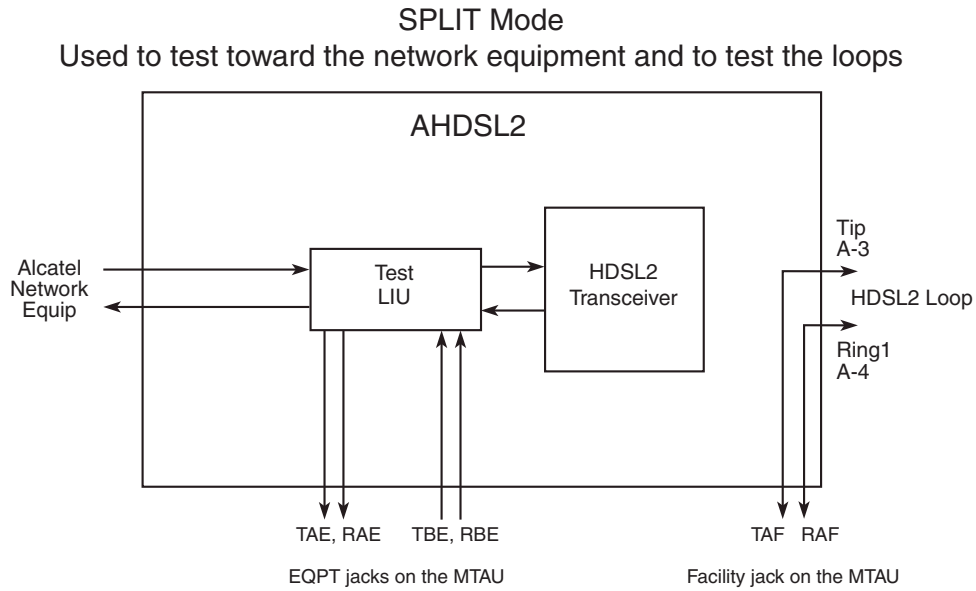


Figure C-1. Split Test Mode

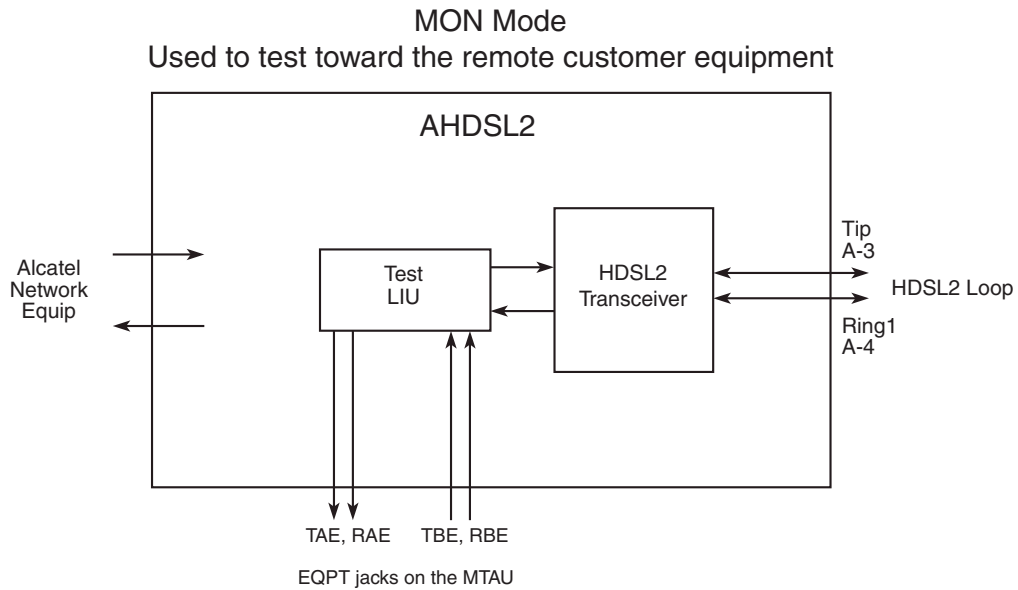


Figure C-2. Monitor Test Mode

REMOVAL OF MTAU TEST ACCESS

DISC-JACK-T1

The Disconnect T1 Jack command disconnects a T1 or HDSL facility from the metallic test access unit (MTAU).

Input Format:

DISC-JACK-T1:<TID>:<AID>:<CTAG>;

Example: DISC-JACK-T1::COT-1-15;

NOTE

AIDs of T1 or HDSL facilities currently connected can be determined using the RTRV-STATUS-MTAU command.

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Appendix D

CBA Wideband Cabling Details

LITESPAN SHELF CABLING PINOUTS

The tables in this appendix provide the cabling details for the Litespan CBA shelf.

- The first column identifies the color code of each pair.
- The second and third columns list the tip-ring pin numbers of either the 710 (or 3M) cable or the AMP cable provided by the CBA.
- The even-numbered cable columns (J2, J4, and J6) list the Slot number/HDSL2 assignment to Loop 1.
- The corresponding Pair columns list the pairs in sequential order.

The following tables are available:

- [“CBA Wideband Cabling/HDSL2 Loop 1 Assignments”](#) on page D-2
- [“Odd CBA Narrowband Cabling \(Last Pair Unassigned\)/HDSL2 Loop 1 Assignments”](#) on page D-3
- [“Even CBA Narrowband Cabling \(Last Pair Unassigned\)/HDSL2 Loop 1 Assignments”](#) on page D-4
- [“ONU-96 Wideband Cabling/HDSL2 Loop 1 Assignments”](#) on page D-5
- [“ONU-96 Narrowbandband Cabling/HDSL2 Loop 1 Assignments”](#) on page D-6

Table D-1. CBA Wideband Cabling/HDSL2 Loop 1 Assignments

Color Code (Base/Ink) Tip - Ring	Pin # (T - R)		J2		J4		J6	
	710 or 3M	AMP	Slot	Pair	Slot	Pair	Slot	Pair
Wh/Bl - Bl/Wh	1 - 2	26 - 1	1-HDSL2-L1	1	21-HDSL2-L1	41	41-HDSL2-L1	81
Wh/Or - Or/Wh	3 - 4	27 - 2	2-HDSL2-L1	2	22-HDSL2-L1	42	42-HDSL2-L1	82
Wh/Gr - Gr/Wh	5 - 6	28 - 3	3-HDSL2-L1	3	23-HDSL2-L1	43	43-HDSL2-L1	83
Wh/Br - Br/Wh	7 - 8	29 - 4	4-HDSL2-L1	4	24-HDSL2-L1	44	44-HDSL2-L1	84
Wh/Sl - Sl/Wh	9 - 10	30 - 5	5-HDSL2-L1	5	25-HDSL2-L1	45	45-HDSL2-L1	85
Rd/Bl - Bl/Rd	11 - 12	31 - 6	6-HDSL2-L1	6	26-HDSL2-L1	46	46-HDSL2-L1	86
Rd/Or - Or/Rd	13 - 14	32 - 7	7-HDSL2-L1	7	27-HDSL2-L1	47	47-HDSL2-L1	87
Rd/Gr - Gr/Rd	15 - 16	33 - 8	8-HDSL2-L1	8	28-HDSL2-L1	48	48-HDSL2-L1	88
Rd/Br - Br/Rd	17 - 18	34 - 9	9-HDSL2-L1	9	29-HDSL2-L1	49	49-HDSL2-L1	89
Rd/Sl - Sl/Rd	19 - 20	35 - 10	10-HDSL2-L1	10	30-HDSL2-L1	50	50-HDSL2-L1	90
Bk/Bl - Bl/Bk	21 - 22	36 - 11	11-HDSL2-L1	11	31-HDSL2-L1	51	51-HDSL2-L1	91
Bk/Or - Or/Bk	23 - 24	37 - 12	12-HDSL2-L1	12	32-HDSL2-L1	52	52-HDSL2-L1	92
Bk/Gr - Gr/Bk	25 - 26	38 - 13	13-HDSL2-L1	13	33-HDSL2-L1	53	53-HDSL2-L1	93
Bk/Br - Br/Bk	27 - 28	39 - 14	14-HDSL2-L1	14	34-HDSL2-L1	54	54-HDSL2-L1	94
Bk/Sl - Sl/Bk	29 - 30	40 - 15	15-HDSL2-L1	15	35-HDSL2-L1	55	55-HDSL2-L1	95
Yl/Bl - Bl/Yl	31 - 32	41 - 16	16-HDSL2-L1	16	36-HDSL2-L1	56	56-HDSL2-L1	96
Yl/Or - Or/Yl	33 - 34	42 - 17	17-HDSL2-L1	17	37-HDSL2-L1	57	N/C	97
Yl/Gr - Gr/Yl	35 - 36	43 - 18	18-HDSL2-L1	18	38-HDSL2-L1	58	N/C	98
Yl/Br - Br/Yl	37 - 38	44 - 19	19-HDSL2-L1	19	39-HDSL2-L1	59	N/C	99
Yl/Sl - Sl/Yl	39 - 40	45 - 20	20-HDSL2-L1	20	40-HDSL2-L1	60	N/C	100
Vi/Bl - Bl/Vi	41 - 42	46 - 21			Spares Tied Off			
Vi/Or - Or/Vi	43 - 44	47 - 22						
Vi/Gr - Gr/Vi	45 - 46	48 - 23			Frame Ground			
Vi/Br - Br/Vi	47 - 48	49 - 24						
Vi/Sl	49	50						
Sl/Vi	N/C	N/C						

Table D-2. Odd CBA Narrowband Cabling (Last Pair Unassigned)/HDSL2 Loop 1 Assignments

Color Code (Base/ Ink) Tip - Ring	Pin # (T - R)		P1 HDSL2 Loop		P2 HDSL2 Loop		P3 HDSL2 Loop		P4 HDSL2 Loop		P5 HDSL2 Loop		P6 HDSL2 Loop		P7 HDSL2 Loop		P8 HDSL2 Loop		P9 HDSL2 Loop	
	710 or 3M	AMP	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr
Wh/Bl - Bl/Wh	1 - 2	26 - 1	1	1							26	101							51	201
Wh/Or - Or/Wh	3 - 4	27 - 2							20	77							45	177		
Wh/Gr - Gr/Wh	5 - 6	28 - 3					14	53							39	153				
Wh/Br - Br/Wh	7 - 8	29 - 4			8	29							33	129						
Wh/Sl - Sl/Wh	9 - 10	30 - 5	2	5							27	105							52	205
Rd/Bl - Bl/Rd	11 - 12	31 - 6							21	81							46	181		
Rd/Or - Or/Rd	13 - 14	32 - 7					15	57							40	157				
Rd/Gr - Gr/Rd	15 - 16	33 - 8			9	33							34	133						
Rd/Br - Br/Rd	17 - 18	34 - 9	3	9							28	109							53	209
Rd/Sl - Sl/Rd	19 - 20	35 - 10							22	85							47	185		
Bk/Bl - Bl/Bk	21 - 22	36 - 11					16	61							41	161				
Bk/Or - Or/Bk	23 - 24	37 - 12			10	37							35	137						
Bk/Gr - Gr/Bk	25 - 26	38 - 13	4	13							29	113							54	213
Bk/Br - Br/Bk	27 - 28	39 - 14							23	89							48	189		
Bk/Sl - Sl/Bk	29 - 30	40 - 15					17	65							42	165				
Yl/Bl - Bl/Yl	31 - 32	41 - 16			11	41							36	141						
Yl/Or - Or/Yl	33 - 34	42 - 17	5	17							30	117							55	217
Yl/Gr - Gr/Yl	35 - 36	43 - 18							24	93							49	193		
Yl/Br - Br/Yl	37 - 38	44 - 19					18	69							43	169				
Yl/Sl - Sl/Yl	39 - 40	45 - 20																		
Vi/Bl - Bl/V	41 - 42	46 - 21	6	21							31	121							56	221
Vi/Or - Or/Vi	43 - 44	47 - 22							25	97							50	197		
Vi/Gr - Gr/Vi	45 - 46	48 - 23					19	73							44	173				
Vi/Br - Br/Vi	47 - 48	49 - 24			13	49							38	149						
Vi/Sl - Sl/Vi	49 - 50	50 - 25	7	25							32	125							dead	225

Table D-3. Even CBA Narrowband Cabling (Last Pair Unassigned)/HDSL2 Loop 1 Assignments

Color Code (Base/ Ink) Tip - Ring	Pin # (T - R)		P1 HDSL2 Loop		P2 HDSL2 Loop		P3 HDSL2 Loop		P4 HDSL2 Loop		P5 HDSL2 Loop		P6 HDSL2 Loop		P7 HDSL2 Loop		P8 HDSL2 Loop		P9 HDSL2 Loop	
	710 or 3M	AMP	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr	Slot	Pr
Wh/Bl - Bl/Wh	1 - 2	26 - 1	dea	226	7	251							32	351						
Wh/Or - Or/Wh	3 - 4	27 - 2	d	227							26	327							51	427
Wh/Gr - Gr/Wh	5 - 6	28 - 3	1						20	303							45	403		
Wh/Br - Br/Wh	7 - 8	29 - 4					14	279							39	379				
Wh/Sl - Sl/Wh	9 - 10	30 - 5			8	255							33	355						
Rd/Bl - Bl/Rd	11 - 12	31 - 6	2	231								27	331						52	431
Rd/Or - Or/Rd	13 - 14	32 - 7							21	307							46	407		
Rd/Gr - Gr/Rd	15 - 16	33 - 8					15	283							40	383				
Rd/Br - Br/Rd	17 - 18	34 - 9			9	259							34	359						
Rd/Sl - Sl/Rd	19 - 20	35 - 10	3	235								28	335						53	435
Bk/Bl - Bl/Bk	21 - 22	36 - 11							22	311							47	411		
Bk/Or - Or/Bk	23 - 24	37 - 12					16	287							41	387				
Bk/Gr - Gr/Bk	25 - 26	38 - 13			10	263							35	363						
Bk/Br - Br/Bk	27 - 28	39 - 14	4	239								29	339						54	43
Bk/Sl - Sl/Bk	29 - 30	40 - 15							23	315							48	415		
Yl/Bl - Bl/Yl	31 - 32	41 - 16					17	291							42	391				
Yl/Or - Or/Yl	33 - 34	42 - 17			11	267							36	367						
Yl/Gr - Gr/Yl	35 - 36	43 - 18	5	243								30	343						55	443
Yl/Br - Br/Yl	37 - 38	44 - 19							24	319							49	419		
Yl/Sl - Sl/Yl	39 - 40	45 - 20					18	295							43	395				
Vi/Bl - Bl/V	41 - 42	46 - 21			12	271							37	371						
Vi/Or - Or/Vi	43 - 44	47 - 22	6	247								31	347						56	447
Vi/Gr - Gr/Vi	45 - 46	48 - 23							25	323							50	423		
Vi/Br - Br/Vi	47 - 48	49 - 24					19	299							44	399				
Vi/Sl - Sl/Vi	49 - 50	50 - 25			13	275							38	375						

Table D-4. ONU-96 Wideband Cabling/HDSL2 Loop 1 Assignments

Color Code (Base/Ink) Tip - Ring	Pin # (T - R)		J1		J2		J3		J4	
	710 or 3M	AMP	Slot	Pair	Slot	Pair	Slot	Pair	Slot	Pair
Wh/Bl - Bl/Wh	1 - 2	26 - 1	N/C	1	N/C	26	N/C	51	N/C	76
Wh/Or - Or/Wh	3 - 4	27 - 2	N/C	2	N/C	27	N/C	52	N/C	77
Wh/Gr - Gr/Wh	5 - 6	28 - 3	1	3	7	28	13	53	19	78
Wh/Br - Br/Wh	7 - 8	29 - 4	N/C	4	N/C	29	N/C	54	N/C	79
Wh/Sl - Sl/Wh	9 - 10	30 - 5	N/C	5	N/C	30	N/C	55	N/C	80
Rd/Bl - Bl/Rd	11 - 12	31 - 6	N/C	6	N/C	31	N/C	56	N/C	81
Rd/Or - Or/Rd	13 - 14	32 - 7	2	7	8	32	14	57	20	82
Rd/Gr - Gr/Rd	15 - 16	33 - 8	N/C	8	N/C	33	N/C	58	N/C	83
Rd/Br - Br/Rd	17 - 18	34 - 9	N/C	9	N/C	34	N/C	59	N/C	84
Rd/Sl - Sl/Rd	19 - 20	35 - 10	N/C	10	N/C	35	N/C	60	N/C	85
Bk/Bl - Bl/Bk	21 - 22	36 - 11	3	11	9	36	15	61	21	86
Bk/Or - Or/Bk	23 - 24	37 - 12	N/C	12	N/C	37	N/C	62	N/C	87
Bk/Gr - Gr/Bk	25 - 26	38 - 13	N/C	13	N/C	38	N/C	63	N/C	88
Bk/Br - Br/Bk	27 - 28	39 - 14	N/C	14	N/C	39	N/C	64	N/C	89
Bk/Sl - Sl/Bk	29 - 30	40 - 15	4	15	10	40	16	65	22	90
Yl/Bl - Bl/Yl	31 - 32	41 - 16	N/C	16	N/C	41	N/C	66	N/C	91
Yl/Or - Or/Yl	33 - 34	42 - 17	N/C	17	N/C	42	N/C	67	N/C	92
Yl/Gr - Gr/Yl	35 - 36	43 - 18	N/C	18	N/C	43	N/C	68	N/C	93
Yl/Br - Br/Yl	37 - 38	44 - 19	5	19	11	44	17	69	23	94
Yl/Sl - Sl/Yl	39 - 40	45 - 20	N/C	20	N/C	45	N/C	70	N/C	95
Vi/Bl - Bl/Vi	41 - 42	46 - 21	N/C	21	N/C	46	N/C	71	N/C	96
Vi/Or - Or/Vi	43 - 44	47 - 22	N/C	22	N/C	47	N/C	72	N/C	97
Vi/Gr - Gr/Vi	45 - 46	48 - 23	6	23	12	48	18	73	24	98
Vi/Br - Br/Vi	47 - 48	49 - 24	N/C	24	N/C	49	N/C	74	N/C	99
Vi/Sl - Sl/Vi	49 - 50	50 - 25	N/C	25	N/C	50	N/C	75	N/C	100
			Drain		Drain		Drain		Drain	

Table D-5. ONU-96 Narrowbandband Cabling/HDSL2 Loop 1 Assignments

Color Code (Base/Ink) Tip - Ring	Pin # (T - R)		P1		P2		P3		P4	
	710 or 3M	AMP	Slot	Pair	Slot	Pair	Slot	Pair	Slot	Pair
Wh/Bl - Bl/Wh	1 - 2	26 - 1	1	1						
Wh/Or - Or/Wh	3 - 4	27 - 2							20	77
Wh/Gr - Gr/Wh	5 - 6	28 - 3					14	53		
Wh/Br - Br/Wh	7 - 8	29 - 4			8	29				
Wh/Sl - Sl/Wh	9 - 10	30 - 5	2	5						
Rd/Bl - Bl/Rd	11 - 12	31 - 6							21	81
Rd/Or - Or/Rd	13 - 14	32 - 7					15	57		
Rd/Gr - Gr/Rd	15 - 16	33 - 8			9	33				
Rd/Br - Br/Rd	17 - 18	34 - 9	3	9						
Rd/Sl - Sl/Rd	19 - 20	35 - 10							22	85
Bk/Bl - Bl/Bk	21 - 22	36 - 11					16	61		
Bk/Or - Or/Bk	23 - 24	37 - 12			10	37				
Bk/Gr - Gr/Bk	25 - 26	38 - 13	4	13						
Bk/Br - Br/Bk	27 - 28	39 - 14							23	89
Bk/Sl - Sl/Bk	29 - 30	40 - 15					17	65		
Yl/Bl - Bl/Yl	31 - 32	41 - 16			11	41				
Yl/Or - Or/Yl	33 - 34	42 - 17	5	17						
Yl/Gr - Gr/Yl	35 - 36	43 - 18							24	93
Yl/Br - Br/Yl	37 - 38	44 - 19					18	69		
Yl/Sl - Sl/Yl	39 - 40	45 - 20			12	45				
Vi/Bl - Bl/V	41 - 42	46 - 21	6	21						
Vi/Or - Or/Vi	43 - 44	47 - 22							N/C	97
Vi/Gr - Gr/Vi	45 - 46	48 - 23					19	73	N/C	98
Vi/Br - Br/Vi	47 - 48	49 - 24			13	49			N/C	99
Vi/Sl - Sl/Vi	49 - 50	50 - 25	7	25					N/C	100

Appendix E

Warranty

WARRANTY AND CUSTOMER SERVICE

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 at www.adtran.com/warranty.

Refer to the following subsections for sales, support, Customer and Product Service (CAPS) requests, or further information.

ADTRAN Sales

Pricing/Availability:

800-827-0807

ADTRAN Technical Support

Pre-Sales Applications/Post-Sales Technical Assistance:

800-726-8663

Standard hours: Monday - Friday, 7 a.m. - 7 p.m. CST

Emergency hours: 7 days/week, 24 hours/day

ADTRAN Repair/CAPS

Return for Repair/Upgrade:

(256) 963-8722

Repair and Return Address

Contact CAPS prior to returning equipment to ADTRAN.

ADTRAN, Inc.

CAPS Department

901 Explorer Boulevard

Huntsville, Alabama 35806-2807



Carrier Networks Division
901 Explorer Blvd.
Huntsville, AL 35806