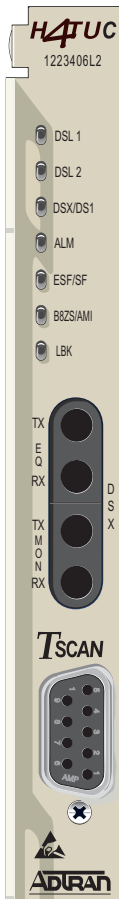


# T200 Transceiver Unit for the Central Office

## HDSL4 T200 H4TU-C

P/N 1223406L2  
CLEI: T113AD2A\_ \_



### CAUTION!

SUBJECT TO ELECTROSTATIC DAMAGE  
OR DECREASE IN RELIABILITY  
HANDLING PRECAUTIONS REQUIRED

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### FRONT PANEL LED STATUS

<b>DSL1/DSL2</b>	● Green	Loop 1/ Loop 2 synchronization achieved and signal is present without errors. SNR margin greater than or equal to 3 dB
	● Red	Loop 1/ Loop 2 synchronization not achieved, in sync with errors, or SNR margin less than 3 dB
<b>DSX/DS1</b>	● Green	DSX/DS1 signal present and no errors currently detected
	● Red	In framed mode, denotes loss of framing or loss of sync at the DSX/DS1 input. In unframed mode, denotes loss of signal DSX/DS1 input
<b>ALM</b>	○ Off	No T1 alarms are active
	● Yellow	Loss of DS1 signal from the CPE
	● Red	Loss of DSX-1 signal from the network
<b>ESF/SF</b>	○ Off	Unit is provisioned for UNFRAMED data
	● Green	Unit is provisioned for SF data
	● Yellow	Unit is provisioned for ESF data
<b>B8ZS/AMI</b>	● Green	Unit is provisioned for AMI line code
	● Yellow	Unit is provisioned for B8ZS line code
<b>LBK</b>	○ Off	No local loopbacks active
	● Yellow	Local loopback active

### DSX EQ SPLITTING JACKS

- TX** DSX-1 transmit toward the local loop (intrusive)
- RX** DSX-1 receive from the local loop (intrusive)

### DSX MONITOR JACKS

- TX** DSX-1 transmit toward the local loop (nonintrusive)
- RX** DSX-1 receive from the local loop (nonintrusive)

### COMPLIANCE

This product is intended to be installed in restricted access areas only and in equipment with a Type "B" or "E" enclosure.

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

This product provides span powering voltage (negative only with respect to ground, -190 VDC nominal, GFI protection < 5 mA) and meets all requirements of Bellcore GR-1089-CORE (Class A2), ANSI T1.418-2002. This product is NRTL listed to the applicable UL standards.

**WARNING:** Up to -200 VDC may be present on telecommunications wiring. The DSX-1 interface is intended for connection to intra-building wiring only. Ensure chassis ground is properly connected.

### POWERING MODE

The H4TU-C provides -190 VDC span powering voltage and will provide powering to the H4Rs and the H4TU-R. The -190 VDC span powering voltage is provided on Loop 2.

### DEFAULT PROVISIONING VALUES

Provisioning Options	Settings	Default
DSX-1 Line Build Out	0, 133, 266, 399, 533	0-133 feet
DSX-1 Line Code	AMI, B8ZS	B8ZS
DSX-1 Framing	SF, ESF, Unframed, Auto	ESF
Forced Frame Conversion	EN, DIS	DIS
Smartjack Loopback	EN, DIS	EN
Loopback Timeout	None, 120 minutes	120 minutes
Latching Loopback Mode	T1 (Disabled), FT1 (Enabled)	T1 (Disabled)
DS1 Transmit Level	0 dB, -7.5 dB, -15 dB	0 dB
Span Power	EN, DIS	EN
Customer Loss Indicator	AIS, AIS/CI, Loopback	AIS/CI
PRM Setting	None, SPRM, NPRM, Auto	Auto
Loop Atten Alarm Threshold	0. Disabled 1-99. Alarm Threshold in dB	34 dB
SNR Margin Alarm Threshold	0. Disabled 1-15. Alarm Threshold in dB	4 dB
Remote Provisioning	EN, DIS	EN

### FEATURES

#### Three-Repeater Support

The T200 H4TU-C can span power three H4R repeaters when the H4TU-R remote unit is locally powered. Refer to the Installation and Maintenance Practice for details.

#### TScan

The ADTRAN® T200 H4TU-C incorporates the TScan™ feature. TScan allows for remote retrieval of circuit diagnostics and performs advanced fault location. For more information about TScan refer to the Installation and Maintenance practice.

#### Bad Splice Detection

The Runtime TScan bad splice detection feature is an ADTRAN proprietary non-intrusive method for detection of anomalies (bad splices) in the copper plant. This feature non-intrusively monitors the cable pair during runtime for the presence of bad splices, which may potentially impact service. Poor splices in the cable are often undetected by normal testing methods. Often, these splices present no problem for the data transmission equipment until the point at which oxidation with the splice itself causes a rapid impedance change. Such a change in impedance may cause errors, signal margin fluctuation, and/or a retrain of the DSL transceivers. The splice detection feature is accessed from the Troubleshooting Screen via the craft access port.

#### Fault Bridging

Fault Bridging minimizes downtime due to an intermittent impairment (GFI, short, micro-interruption, bad splice, noise burst, etc.) that appears on the cable pair. This allows the DSL transceivers to maintain synchronization during an interruption, thus avoiding a retrain. Depending on the impairment, interruptions as long in duration as 200 ms can be bridged.

#### Fast Retrain

Fast Retrain is an ADTRAN proprietary feature that minimizes downtime caused by an intermittent impairment which due to its duration cannot be bridged. When such impairments occur, the fast retrain feature will be invoked to restore service within 5 to 7 seconds, instead of the traditional 25 to 30 second retrain duration.

**NOTE:** Fast-Retrain capable units must be installed on both ends of the circuit for this feature to function properly. Also, if there is a failure, for any reason, of a fast retrain attempt then the traditional (25-30 second) retrain will be initiated.



HDSL4

# T200 Transceiver Unit for the Central Office

PRICING AND AVAILABILITY 800.827.0807  
TECH SUPPORT 800.726.8663  
RETURN FOR REPAIR 256.963.8722  
www.adtran.com  
61223406L2-22B

## TROUBLESHOOTING HDSL4

This ADTRAN HDSL4 unit is equipped with troubleshooting-at-a-glance LEDs (identified on the reverse side of this document) that provide customers with a simple means of identifying the location of certain faults. Additionally, screens available via the craft interface simplify the trouble isolation process. These screens and their associated benefits are described below.

**NOTE:** Upon connecting, it may be necessary to press the spacebar three times for the screen to display properly.

### Troubleshooting Screen

Available via the Main Menu: provides ADTRAN contact information and access to the Troubleshooting Guidance and General Information screens.

### Troubleshooting Guidance Screens

Available via the Troubleshooting screen: detects and displays errors and/or alarms at any of the monitored inputs (DSX1, DS1 and HDSL). Guidance on the fault(s) detected includes possible cause(s) and suggested actions, including those shown below:

<b>DSX-1/DS1:</b>		<b>Facility:</b>	
LOS	Loss of signal (Red Alarm) at the DSX-1/DS1 receiver	GROUND	Ground Fault on span (facility pair grounded)
CLK	T1 receive clock is out of range	SHORT	Short circuit (or low impedance) between pairs
RAI	Remote Alarm Indication (Yellow Alarm) detected at DSX-1/DS1 receiver	OPEN	Open circuit between facility pairs
AIS	Alarm Indication Signal (Blue Alarm) detected at DSX-1/DS1 receiver	<b>DSL:</b>	
ERR	Errors recorded at DSX-1/DS1 receiver	LOS	Loss of HDSL sync
		MARG	Margin has exceeded the alarm threshold
		ATTEN	Attenuation has exceeded the alarm threshold
		ERR	Errors recorded at the HDSL receiver
		HIST	Performance History of the DSL units

### General Information Screen

Available via the Troubleshooting screen: a reference page which displays the minimum acceptable signal margin, maximum attenuation, and other deployment parameters for this HDSL4 circuit.

**NOTE:** Along with the Troubleshooting screens, the Detailed Status screen and Performance History screen, available via the craft access terminal, provide both real-time and historical view of this circuit.

**NOTE:** For complete deployment guidelines on the HDSL4 circuit, refer to the Installation and Maintenance Practice referenced on the front page.

ATTENUATION LIMITS		
Segment	Recommended Maximum	
	Upstream	Downstream
1 <sup>st</sup> segment	30 dB	32 dB
2 <sup>nd</sup> and 3 <sup>rd</sup> segment	28 dB	28 dB

RANGE LIMITS, PIC Cable, 70°F	
Gauge/Segment	Recommended Maximum
26 Gauge, 1 <sup>st</sup> segment	10,470 feet
26 Gauge, 2 <sup>nd</sup> and 3 <sup>rd</sup> segment	9,865 feet <sup>1,2</sup>
24 Gauge, 1 <sup>st</sup> segment	14,770 feet
24 Gauge, 2 <sup>nd</sup> and 3 <sup>rd</sup> segment	14,050 feet <sup>1,2</sup>

<sup>1</sup> In three segment circuits (two H4Rs), individual segment resistance values *must be verified*. Refer to the Installation and Maintenance Practice for details and calculations.

<sup>2</sup> When designing a dual H4R loop (three segment), the first segment should have lower DC resistance than the second segment.

## LOOPBACK CONTROL CODES

Pattern	Description	Requires Arming?
1in3	Loop down all units and disarm	No
2in5	Arming Pattern, H4TU-R loops back if Smartjack LB is enabled	No
3in5	Disarm and loop down all units. Restores LB TMO after D5D6	No
2in6	H4R1 LB to Network	No
3in6	H4R2 LB to Network	No
4in6	H4R1 LB to Customer	No
5in6	H4R2 LB to Customer	No
3in7	H4TU-R LB to Network	No
4in7	H4TU-C LB to Network	No
5in7	H4TU-R LB to Customer	No
6in7	H4TU-C LB to Customer	No
3F1E	H4TU-C LB to Customer	No
3F02	H4TU-R LB to Customer	No
3F04	H4R1 LB to Customer	No
3F06	H4R2 LB to Customer	No
3F08	H4R3 LB to Customer	No
6767	Disable span powering while present	Yes
9393	Loop down H4TU-C, Repeaters – all loopbacks. Loop down H4TU-R – Cust LB always. Loops down H4TU-R – Network LB only if NIU is disabled. Does not disarm units if they are armed	No
C741	H4R1 loop back pattern. 10 bit error injection	Yes
C742	H4TU-R loop back pattern. 20 bit error injection	Yes
C754	H4R2 loop back pattern. 200 bit error injection	Yes
C743	H4R3 loop back pattern. 30 bit error injection	Yes
D3D3	H4TU-C loop back pattern. 231 bit error injection	Yes
D5D5	Query Loopback Pattern (error injection) H4TU-C: 231 Errors, H4R1: 10 Errors, H4R2: 200 Errors, H4R3: 30 errors; H4TU-R: 20 Errors	No
D5D6	Loopback Timeout Override: Disables LB timeout. Restores original LB timeout when unit is disarmed	Yes
FF48	FDL Arming Pattern (ESF only). Arms all units, H4TU-R loops back toward Network if NIU is set to Enabled (if pattern sources at network)	No
FF24	FDL Disarm Pattern (ESF only). Loop down and disarm all units	No
FF1E	H4TU-C LB to Network. Does not loop back the H4TU-C if the H4TU-C is already in LB to Customer	No
FF02	H4TU-R LB to Network. Does not loop back the H4TU-R if any unit is already in LB to Customer	No
FF04	H4R1 LB to Network	No
FF06	H4R2 LB to Network	No
FF08	H4R3 LB to Network	No

**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 at [www.adtran.com/warranty](http://www.adtran.com/warranty).