T200 H2TU-R

CLEI: T1L4U7PC_ _

CAUTION!
SUBJECT TO ELECTROSTATIC DAMAGE OR DECREASE IN RELIABILITY.
HANDLING PRECAUTIONS REQUIRED.

STATUS LEDs

DSL	○	OFF	No synchronization between the H2TU-C and the H2TU-R on the loop
	●	RED	Poor signal quality on the loop (> 10^{-7} BER)
	●	YELLOW	Marginal signal quality on the loop (≤ 2 dB margin above 10^{-7} BER)
	●	GREEN	Good signal quality on the loop (> 2 dB margin above 10^{-7} BER)
	✷	BLINKING	Detected error on either end of the loop
DS1	○	OFF	Customer-side DS1 signal is absent or is in a format that does not match the provisioning of the HDSL2 circuit
	✷	BLINKING	Detected error on the DS1 interface
	●	SOLID	Customer-side DS1 signal is present and synchronized
ALM	○	OFF	No alarm condition detected
	●	RED	Detected local alarm condition (H2TU-R)
	●	YELLOW	Detected remote alarm condition (H2TU-C)
ESF / SF	○	OFF	DS1 is provisioned for unframed operation
	●	YELLOW	DS1 is provisioned for ESF framing mode
	●	GREEN	DS1 is provisioned for SF framing mode
B8ZS / AMI	●	YELLOW	DS1 is provisioned for B8ZS coding
	●	GREEN	DS1 is provisioned for AMI coding
LBK	○	OFF	Unit is not in loopback or armed state
	●	YELLOW	Active local bidirectional loopback from the H2TU-R toward the customer and/or the network
	✷	BLINKING	Unit is armed but not in active loopback condition

FACEPLATE LBK BUTTONS

REM
- Controls a customer loopback at the H2TU-C

LOC
- Controls a bidirectional loopback at the H2TU-R

MONITOR BANTAM JACKS

- Provides a non-intrusive access point for monitoring the transmit and receive signals at the DS1 interface

TX — monitors signal being received from customer equipment
RX — monitors signal being transmitted to customer equipment

RS-232 DB-9 CONNECTOR

- Used to access the HDSL2 utilities menu tree via VT100 emulation software such as Terminal, Hyper Terminal – Private Edition, and ProComm Plus.
- There are two types of terminal emulation modes, Manual and Real-Time. To toggle between the two, type "CTRL" and "T." To update the screens while in Manual Mode, press the space bar 3 times. Real-Time Update Mode is the default mode.
- Provision terminal port as follows:

  Data Rate — 1.2 kbps to 19.2 kbps
  Asynchronous Data Format — eight data bits, no parity (none), one stop bit, and no flow control.

- When using a PC with terminal software, be sure to disable any power saving programs.

CARD EDGE PIN ASSIGNMENTS

Note: This specific unit is intended for Local Power Only. If a span powered unit is needed, refer to P/N 1222026L6.

Pin	Designation	Description
1	CH GND	Chassis ground
5	DS1-T1	DS1 receive out tip (to customer interface)
7	H1-T	HDSL2 Loop tip (facility)
11	CH GND	Chassis ground
12	GND	Ground for protection switching
13	H1-R	HDSL2 Loop ring (facility)
15	DS1-R1	DS1 receive out ring (to customer interface)
17	-48V R	-48V return
20	VCC	+5 Vdc for protection switching
27	CH GND	Chassis ground
35	-48V	-48V supply
40	PROT-1	Control line for protection switching
49	DS1-R	DS1 transmit in ring (from customer interface)
55	DS1-T	DS1 transmit in tip (from customer interface)

COMPLIANCE CODES

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

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

WARRANTY

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

HDSL2 TROUBLESHOOTING GUIDE

Pricing and Availability 800.827.0807
Tech Support 800.726.8663
Return for Repair 256.963.8722
www.adtran.com
61222024L6-22A

INDICATIONS AND PROBABLE CAUSES

Front Panel or Circuit Parameters Indicate Abnormal Operation

Connect a terminal or PC to the RS-232 (DB-9) craft interface on the faceplate. The terminal must be VT100 or compatible and set for 1.2 to 19.2 kbps, 8 data bits, no parity, 1 stop bit, and no flow control. Select "3" from the ADTRAN HDSL2 Main Menu Screen and "2" from the Span Status Screen:

- Is signal quality fluctuating (this would occur when real time mode is active)?
- Is ATTEN (pulse attenuation) > 30 dB?
- Are there any errors counting on the ES, SES, or UAS registers?

If all of the above conditions do not exist, the circuit should provide quality service; however, if any of the above conditions exist, a cable problem or excessive loss situation is probable and more detailed cable testing should be done to verify all HDSL2 Loop Specifications are met. These conditions may also reflect intermittent cable faults or excessive noise impairments. If intermittent faults or noise impairments are suspected, select "5" from the HDSL2 Main Menu to review the Performance History Screen.

Front Panel Indications Under Normal Operation

DSL	● Green
DS1	● Green
ALM	○ Off
LBK	○ Off

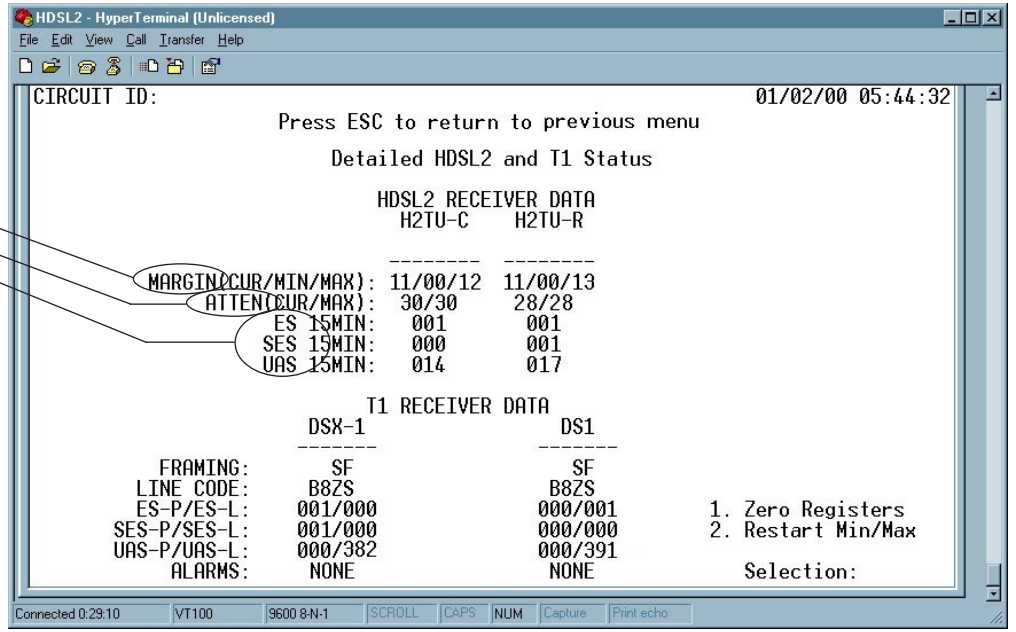
Circuit Parameters Under Normal Operation

- LOSS ≤ 30 dB
- Good signal quality with no fluctuation
- All HDSL2 Deployment Guidelines are met

HDSL2 DEPLOYMENT GUIDELINES

- Cable pairs must be non-loaded
- Total bridged tap < 2.5 kft
- No single bridged tap > 2 kft
- 196 kHz insertion loss ≤ 35 dB
- Pulse attentuation (loss on HDSL2 System Status Screen) ≤ 30 dB
- Maximum loop resistance is 900 Ω
- Impulse noises ≤ 50 dBrn as measured using a 50 kb filter
- Wideband noise ≤ 31 dBrn as measured using a 50 kb filter

For further information regarding deployment guidelines and applications, reference ADTRAN's Supplemental Deployment Information for HDSL/HDSL2 document, P/N 61221HDSLL1-10.



HDSL2 Loopback Control Codes

Name	Code	Comments
Arming (In-band)	11000	Signal sent in-band or over ESF data link. HDSL2 elements in disarmed
Arming (ESF)	0001 0010 1111 1111 (12 FF Hex)	state make transition to armed state. Detection of either code results in Smartjack loop up, if NIU loopback is enabled.
Activation (H2TU-C)	1101 0011 1101 0011 (D3D3 Hex)	Signal sent in-band. HDSL2 elements in armed state make transition to loop-up state. Loop Up state timeout is programmable from the H2TU-C.
Activation (H2TU-R)	1100 0111 0100 0010 (C742 Hex)	
Deactivation	1001 0011 1001 0011 (9393 Hex)	Signal sent in-band. HDSL2 element loop up state makes transition to armed state.
Disarming (In-band)	11100	Signal sent in-band or over ESF data link. HDSL2 elements in any state
Disarming (ESF)	0010 0100 1111 1111 (24FF Hex)	make transition to disarmed state.
Arming Timeout	N/A	2 Hours
Loop-up Timeout	N/A	HDSL2 element in loop up makes transition to armed state. Programmable from H2TU-C: None, 20, 60, or 120 minutes.
Loopback Timeout Override	1101 0101 1101 0110 (D5D6 Hex)	Signal sent in-band. Sets Loopback Timeout to NONE. Timeout will return to previous value when pattern is removed. Arming pattern (11000) must precede this pattern.