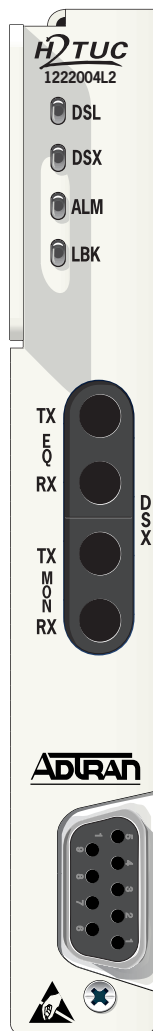


3192 H2TU-C

CLEI: T1L3X6AA_ _



LED STATUS

- DSL**
- Off No synchronization between H2TU-C and 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).
- DSX**
- Off Network side DSX-1 signal is absent or is in a format that does not match the provisioning of the HDSL2 circuit.
 - * Blinking Bipolar Violation (BPV), frame bit error (SF mode) or CRC error (ESF mode) detected at DSX-1 signal.
 - Solid Network side DSX signal is present and synchronized.
- ALM**
- Off No alarm condition detected.
 - Red Detected local alarm condition (H2TU-C) or locally and remotely (H2TU-C and H2TU-R).
 - Yellow Detected remote alarm condition (H2TU-R).
- LBK**
- Off Unit is not in loopback or armed state.
 - Yellow Active local bidirectional loopback from the H2TU-C toward the customer and the network.
 - * Blinking Unit is armed but not in active loopback condition.

BANTAM JACKS

MON

- Provides a nonintrusive tap to monitor characteristics of the DSX signal
 - TX — monitors signal being received from the network
 - RX — monitors signal being transmitted to the network

EQ

- Provides an intrusive signal interrupting access point to the data stream
 - TX — accesses the data stream being transmitted toward the customer
 - RX — accesses the data stream being received from the customer

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.

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.

CIRCUIT BOARD 5-POSITION ROTARY SWITCH

Sets the DSX-1 Line Build Out (LBO). (Default settings are in **bold**.)

- **0** — **0-133 feet of LBO**
- 133 — 133-266 feet of LBO
- 266 — 266-399 feet of LBO
- 399 — 399-533 feet of LBO
- 533 — 533-655 feet of LBO

CIRCUIT BOARD 6-POSITION DIP SWITCH

Provisions the unit. (Default settings are in **bold**.)

SW1-1

- Selects line coding to AMI or **B8ZS**

SW1-2

- Selects T1-framing to **FRAMED** or UNFRAMED¹

SW1-3

- Selects T1-framing to SF or ESF

SW1-4

- **ENABLES** or **DISABLES** the NIU loopback

SW1-5

- **ENABLES** or **DISABLES** the loopback time out²

SW1-6

- **ENABLES** or **DISABLES** shelf alarm feature.

¹UNFRAMED operation ignores the setting of SW1-3

²Default timeout setting is 20 minutes when loopback time out is ENABLED

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. Up to -200 Vdc may be present on telecommunications wiring. The DSX-1 interface is intended for connection to intra-building wiring only.

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



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, located 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 ATTN (pulse attenuation) > 30 dB?
- Are there any errors counting on the ES, SES, or UAS registers?

If the above conditions do not exist, the circuit should provide quality service; however, if any of the above conditions exist, 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 |
| DSX | ● Green |
| ALM | ○ Off |
| LBK | ○ Off |

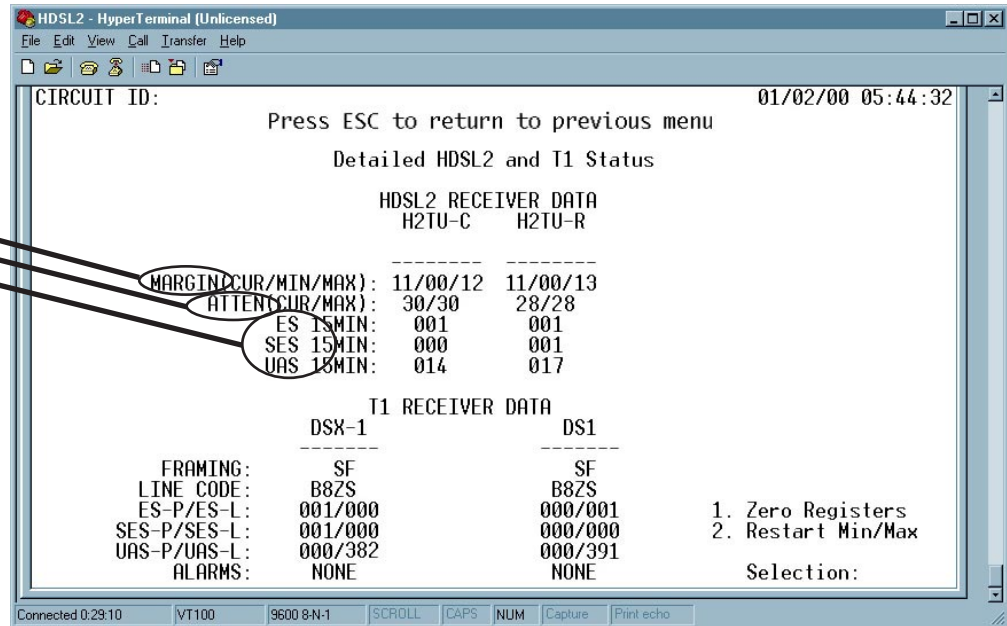
Circuit Parameters Under Normal Operation

- 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 attenuation (loss on HDSL2 Span 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 more information regarding deployment guidelines and applications, reference ADTRAN's Supplemental Deployment Information for HDSL/HDSL2, 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 state make transition to armed state. Detection of either code results in Smartjack loopup, if NIU loopback is enabled.
Arming (ESF)	0001 0010 1111 1111 (12 FF Hex)	
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 loopup state makes transition to armed state.
Disarming (In-band)	11100	Signal sent in-band or over ESF data link. HDSL2 elements in any state make transition to disarmed state.
Disarming (ESF)	0010 0100 1111 1111 (24FF Hex)	
Arming Time out	N/A	2 Hours
Loopup Time out	N/A	HDSL2 element in loopup makes transition to armed state. Programmable from H2TU-C: None, 20, 60, or 120 minutes.
Loopback Time out 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.
Span Power Disable	0110 0111 0110 0111 (6767 Hex)	Signal sent in-band. Disables span powering of remotes. Span power will return when pattern is removed. Arming pattern (11000) must precede this pattern.