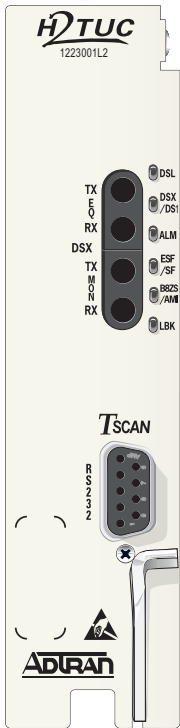


HDSL2 220 H2TU-C

P/N 1223001L2
CLEI: T113AEKA_ _



FRONT PANEL LEDES

DSL	● Green	DSL sync, no errors currently detected, and signal margin > 2 dB
	● Red	No DSL sync, errors being detected, or signal margin ≤ 2 dB
DSX/DS1	● Green	DSX-1 signal is present and no errors currently being detected
	● Red	No DSX-1 signal or signal is present with errors
ALM	○ Off	No active alarm present
	● Red	Loss of DSX-1 signal to the unit
	● Yellow	Loss of DS1 signal to the remote
ESF/SF	○ Off	Unit is provisioned for UNFRAMED data
	● Green	Unit is provisioned for SF data
	● Yellow	Unit is provisioned for ESF data
B8ZS/AMI	● Green	Unit is provisioned for AMI line code
	● Yellow	Unit is provisioned for B8ZS line code
LBK	○ Off	Unit is not in loopback
	● Yellow	Unit is in loopback (network and/or customer)

RS-232 DB-9 CONNECTOR

- ◆ Used to access performance monitoring data, perform loopbacks, and provision units via VT100 emulation software (such as HyperTerminal – Private Edition and ProComm Plus).
 - ◆ There are two types of terminal emulation modes:
 - ◆ **Manual Emulation Mode:** Press the space bar three times to manually update the screen. Print Screen and Log File commands are available in this mode.
 - ◆ **Real-Time Emulation Mode:** The default mode. Print Screen and Log File commands are not available in this mode. Cursor placement and screen highlighting are enabled.
 - Use CTRL+T to toggle between the two terminal emulation modes.
 - ◆ Provision terminal port as follows:
 - ◆ Data Rate: 1.2 to 19.2 kbps
 - ◆ Asynchronous Data Format: Eight data bits, no parity (none), one stop bit
 - ◆ When using a PC with terminal software, disable any power saving programs.
- NOTE:** Upon connecting, it may be necessary to press the spacebar three times for the screen to display properly.

CARD EDGE PINOUT

Pin	Description	Pin	Description
15	-48 VDC Return	39	-48 VDC
16	-48 VDC Return	42	DSX-1 RX Tip (Input to H2TU-C)
17	-48 VDC Return	43	DSX-1 RX Ring (Input to H2TU-C)
19	-48 VDC Return	44	-48 VDC Return
26	HDSL2 Tip	49	DSX-1 TX Tip (Output from H2TU-C)
27	HDSL2 Ring	50	DSX-1 TX Ring (Output from H2TU-C)
32	Fuse Alarm		

Provisioning Option	Option Settings	Default Settings
1. DSX-1 Line Build Out	0–133 feet; 133–266 feet; 266–399 feet; 399–533 feet; 533–655 feet; *External	0–133 feet * External - Used only for Kentrox shelves. Unit transmits 12-volt p-p to DSX panel.
2. DSX-1/DS1 Line Code	B8ZS, AMI	B8ZS
3. DSX-1/DS1 Framing	SF, ESF, Unframed, Auto	ESF
4. Force Frame Conversion	Disabled, Enabled	Disabled
5. Smartjack Loopback	Disabled, Enabled	Enabled
6. Loopback Time Out	None, 120 Minutes	120 Minutes
7. Latching Loopback Mode	T1 (Disabled), FT1 (Enabled)	T1 (Disabled)
8. DS1 Tx Level	0 dB, -7.5 dB, -15 dB	0 dB
9. Span Power	Enabled, Disabled	Enabled
10. Customer Loss Indicator	AIS, Loopback, AIS/CI	AIS/CI
11. PRM Setting	None, SPRM, NPRM, AUTO	AUTO
12. Loop Atten Alarm Thres	0 (Disabled), 1-99 dB	30 dB
13. SNR Margin Alarm Thres	0 (Disabled), 1-15 dB	04 dB
14. Remote Provisioning	Disabled, Enabled	Enabled

COMPLIANCE

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.

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.

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

BANTAM JACKS

Bantam jacks provide both intrusive and non-intrusive test access points into the data stream.

EQ-intrusive

- ◆ **TX** DSX-1 transmit toward the local loop
- ◆ **RX** DSX-1 receive from the local loop

MON

- ◆ **TX** Monitors the data stream being received from the network
- ◆ **RX** Monitors the data stream being transmitted to the network



CAUTION!

SUBJECT TO ELECTROSTATIC DAMAGE
OR DECREASE IN RELIABILITY
HANDLING PRECAUTIONS REQUIRED

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TROUBLESHOOTING HDSL2

This ADTRAN HDSL2 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 the associated benefits are described below.

Troubleshooting Screen

Available via the Main Menu (Option 12) - Provides ADTRAN contact information and access to the Troubleshooting Guidance and General Information screens.

Troubleshooting Guidance Screens

Available via the Troubleshooting screen (Option 1) - 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:

DSX-1/DS1:

- LOS Loss of signal (Red Alarm) at the DSX-1/DS1 receiver
- CLK T1 receive clock is out of range
- RAI Remote Alarm Indication (Yellow Alarm) detected at DSX-1/DS1 receiver
- AIS Alarm Indication Signal (Blue Alarm) detected at DSX-1/DS1 receiver
- ERR Errors recorded at DSX-1/DS1 receiver

Facility:

- GROUND Ground Fault Interrupt on span voltage (facility pair grounded)
- SHORT Short circuit (or low impedance) between facility pairs
- OPEN Open circuit between facility pairs

DSL:

- 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 (Option 2) - a reference page which displays the minimum acceptable signal margin, maximum attenuation, and other deployment parameters for this HDSL2 circuit. A sample display of this screen is shown below:

HDSL2 Loop Guidelines for optimum operation

-
- Non-loaded cable pair
- Single bridge tap < 2 kft
- Total bridge taps < 2.5 kft
- Impulse noise < 50 dBrnF (F filter)
- Wideband noise < 31 dBrnF (F filter)
- Power influence ≤ 80 dBrnC
- Longitudinal Balance ≥ 60 dB (If using Wideband test at 196 khz ≥ 40dB)
- Foreign DC Voltage (t-r, t-g, r-g) < 3 VDC
- Loop Resistance ≤ 775 ohms
- Margin ≥ 6 dB
- Attenuation ≤ 28 dB

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.

FEATURES

TScan

This module 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 splice detection feature is an ADTRAN proprietary non-intrusive method for detection of anomalies (poor splice connections) in the copper plant.

Data transmission transceivers, especially echo-cancelled technologies, such as HDSL2 (or HDSL4) are subject to degraded performance in the presence of deteriorating splice connections. This deterioration is often undetected by normal testing methods. Often, these splices present no problem for the data transmission equipment until the point at which oxidation within 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. To address the difficulty in identifying deteriorating splice connections, ADTRAN has developed the splice detection feature, which non-intrusively monitors the cable pair during runtime for the presence of deterioration.

The screen below, accessed from the troubleshooting screen, shows a suspect splice 250 feet from the H2TU-C.

```

Circuit ID:                                06/06/04 09:29:45
                                           Press ESC to return to previous menu

* Note: Chronic Circuit Results are only valid after all other circuit *
* qualification tests have been performed and failed to show a trouble !! *

Splice Detector Version 1 Result Definitions:
-----
NTF - No Trouble Found yet.
LOS - Unit not in sync.
Number - Distance from Reference point (in ft.) of suspect splice.

Reference   Splice Detection   Version   Result Shown
Point       Results            Number    for date
-----
H2TUC      250                01        -----
H2TUR      NTF                --        06/06/04

                                           (B) Back
    
```

Fault Bridging

Fault Bridging is a feature that minimizes downtime due to an intermittent impairment (GFI, short, micro-interruption, bad splice, noise burst, etc.) that appears on the cable pair.

The bridging feature allows the DSL transceivers to maintain synchronization during such an interruption, thus avoiding a 25 to 30 second retrain. Depending on the type of impairment, interruptions as long in duration as 200 ms can be bridged.

Fast Retrain

Fast Retrain is an ADTRAN proprietary feature that minimizes downtime due to an intermittent impairment (bad splice, noise burst, etc.) which due to its duration cannot be bridged.

When such impairments occur after HDSL synchronization has been achieved, the fast retrain feature will be invoked to restore service within 5 to 7 seconds. This short retrain time allows for reduced downtime compared to the traditional 25 to 30 second retrain duration.

NOTE: *Fast-Retrain capable units must be installed on both ends of the HDSL2 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.*