

HDSL2 T200 H2TU-R

CLEI: T1L3W71A_



LED STATUS

STAT	<input type="radio"/> Off	Indicates a blown fuse or loss of power.
	* Blinking	Attempting to acquire HDSL2 synchronization with the H2TU-C.
	● Green	Normal operation; HDSL2 synchronization is achieved with the H2TU-C.
DLOS	<input type="radio"/> Off	DSX-1 signal from the network is present at the H2TU-C input.
	● Red	DSX-1 signal from the network is absent at the H2TU-C input.
RLOS	<input type="radio"/> Off	DS1 signal from the CPE is present at the H2TU-R.
	● Red	DS1 signal from the CPE is absent at the H2TU-R.
HLOS	<input type="radio"/> Off	Normal operation; HDSL2 synchronization is achieved end-to-end on the 2-wire Loop.
	* Blinking	GFI or overcurrent condition detected.
	● Red	Loss of end-to-end HDSL2 synchronization on the 2-wire Loop.
DSL	<input type="radio"/> Off	HDSL synchronization has not been achieved on the 2-wire Loop between the H2TU-C and the H2TU-R.
	● Green	Normal operation; signal quality (Margin) is optimum (6 dB or more) on the 2-wire Loop between the H2TU-C and the H2TU-R.
	● Yellow	Marginal operation; signal quality (Margin) is 1-5 dB on the 2-wire Loop between the H2TU-C and the H2TU-R.
	● Red	Severely impaired operation; signal quality (Margin) is 0 dB on the 2-wire Loop between the H2TU-C and the H2TU-R.
	* Blinking	If the pulse attenuation is 30 dB or below, the DSL LED will remain solid. If the pulse attenuation is above the recommended threshold for quality service the DSL LED will blink Green, Yellow or Red as determined by the signal quality. <i>NOTE: If the signal quality is good and the pulse attenuation is bad, the LED will blink Green. If the signal quality is marginal and the pulse attenuation is good, the LED will be solid Yellow.</i>
HCRC	<input type="radio"/> Off	Normal operation; No HDSL2 CRC errors detected by this unit within the last 30 minutes on the 2-wire Loop.
	* Blinking	One or more HDSL2 CRC errors are being detected by this unit on the 2-wire Loop.
	● Yellow	Four or more HDSL2 CRC errors have occurred on the 2-wire Loop in the last 30 minutes. The LED will remain lit for 30 minutes. If no HDSL2 CRC errors occur within a rolling 30 minute interval, the Yellow CRC LED will extinguish.
ARM/LBK	<input type="radio"/> Off	Unit is not in the armed or loopback state.
	● Yellow	Unit is in an armed state.
	● Green	A loopback is active on this specific unit.
B8ZS	<input type="radio"/> Off	The unit is provisioned for AMI line code.
	● Green	The unit is provisioned for B8ZS line code.
AIS/LP	<input type="radio"/> Off	Toggling the CPE LOS OPT button to this position will result in AIS being sent to network upon Customer Loss of Signal.
	● Green	Toggling the CPE LOS OPT button to this position will result in loopback to network upon Customer Loss of Signal. If inadvertently looped down, unit will automatically go back into loopback within 10 minutes.

NOTE: When used with an ADTRAN H2TU-C, the terminal screens via the H2TU-R will display information that is stored at the H2TU-C.

OPTIONS

Faceplate Buttons

CPE LOS OPT Press this button (CPE LOS OPT) to control the Customer Loss of Signal response. Provision the unit to loopback to network or to send AIS to network. A Green LED indicates loopback to network. An extinguished AIS/LP LED indicates AIS sent to network.

LBK Press this button (LBK) to activate or release a bidirectional loopback toward the customer and the network. A GREEN ARM/LBK LED indicates an active loopback is present.

Line Buildout

The DS1 line buildout options can be accessed via the RS-232 DB-9 craft interface. The available DS1 line buildout levels are 0 dB, -7.5 dB, -15 dB. The default setting is 0 dB.

POWER

This specific unit is intended for **Span Power Only**. If a Locally Powered unit is needed, refer to P/N 1222024L7.

DS1 MONITOR JACKS

TX	DS1 signal from CPE toward Network (nonintrusive)
RX	DS1 signal from Network toward CPE (nonintrusive)

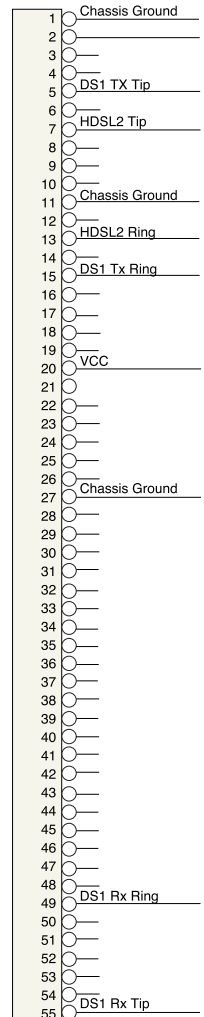
COMPLIANCE CODES

Caution: Up to -200 Vdc may be present on telecommunications wiring.

This product is intended for installation in restricted access locations only and in equipment with a Type "B" or "E" enclosure. Ensure chassis ground is properly connected.

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

CARD EDGE PIN ASSIGNMENTS



ADTRAN HDSL2 equipment is designed with troubleshooting-at-a-glance features. The following information provides suggestions for troubleshooting as a result of LED indications which are indicative of loop trouble.

Note: Pressing “ESC” while on any screen will go back to the previous screen.

TERMINAL EMULATION MODES

Note: Pressing “CTRL” and “T” while on any screen will toggle between manual and real-time modes.

Manual Emulation Mode:

Press the space bar 3 times to manually update the screen. Print screen and log file commands are available.

Real-Time Emulation Mode:

The default mode. Pressing “CTRL” and “T” will also toggle between modes from any screen. Print screen and log file commands are not available in this mode. Cursor placement and screen highlighting are enabled.

INDICATIONS AND POSSIBLE CAUSES

DSL LED Yellow

Connect a terminal or PC to the RS-232 (DB-9) craft interface on 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, No Flow control. Select “3” from the ADTRAN HDSL2 Main Menu Screen and “2” from the Span Status Screen. Verify the following conditions on the Detailed HDSL2 and T1 Status Screen:

- 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, 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 and review the Performance History Screen.

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CIRCUIT ID: 01/01/00 00:37:20
PRESS ESC to return to previous menu
Detailed HDSL2 and T1 Status
-----
HDSL2 RECEIVER DATA
H2TU-C      H2TU-R
-----
MARGIN(CUR/MIN/MAX): 11/00/12 11/00/13
ATTN(CUR/MAX): 30/30 29/29
INS LOSS(CUR/MAX): 30/38 37/37
-----
ES 15MIN: 001 001
SES 15MIN: 000 001
UAS 15MIN: 014 017
-----
T1 RECEIVER DATA
DSX-1      DS1
-----
FRAMING: UNFR UNFR
LINE CODE: 8B2S 8B2S
ES-P/ES-L: 001/000 000/000
SES-P/SES-L: 001/000 000/000
UAS-P/UAS-L: 000/382 000/391
ALARMS: NONE NONE
Selection:
    
```

Note: The Detailed Status selection from the System Status Menu, illustrated above, displays the HDSL2 and T1 status for each receiver point. The insertion loss reading shown on the Detailed Status Screen is an approximation that is valid for some loops. Caution should be used when using this value.

HCRC LED Yellow

Indicates four or more HDSL2 CRC errors have occurred within the last 30 minutes. Select “5” from the HDSL2 Main Menu to review the Performance History Screen. If the DSL LED is Yellow, verify the span between the H2TU-R and the next HDSL2 element (i.e. H2R, H2TU-C) meets HDSL2 Loop Specifications.

HDSL2 LOOP SPECIFICATIONS FOR OPTIMUM OPERATION

- Cable pair must be non-loaded
- Maximum loop resistance is 900 Ω
- Total Bridged Tap < 2.5 kft
- No single Bridged Tap > 2kft
- Foreign Voltage DC (t-r, t-g, r-g) < 3 Vdc
- Insulation Resistance (t-r, r-g, t-g) > 3.5 MΩ
- Longitudinal Noise (Power Influence) < 80 dBmC
- 196 KHz insertion loss ≤ 35 dB (135 Ω termination)
- Impulse Noise ≤ 50 dBm as measured using a 50 kb filter
- Wideband Noise ≤ 31 dBm as measured using a 50 kb filter
- Pulse Attenuation (ATTEN on HDSL2 Span Status screen) ≤ 30 dB
- Signal quality of 6 dB or higher, with no fluctuation
- Internal Clock Accuracy ±25 ppm (exceeds Stratum 4)

For further information regarding deployment guidelines and applications, reference ADTRAN’s HDSL/HDSL2 Loop Qualification document, P/N 61221HDSL11-10.

LOOPBACK AND CONTROL CODES

FUNCTION	CODE	RESPONSE
ARM (inband)	11000 (binary)	H2TU-C will arm and the H2TU-R will loop-up toward the network.
ARM (ESF Data Link)	FF48 (hex) or 1111 1111 0100 1000 (binary) sent in the Facility Data Link	H2TU-C will arm and the H2TU-R will loop-up toward the network
Disarm (inband)	11100 (binary)	All units are removed from the armed state and loopbacks will be released
Disarm (ESF Data Link)	FF24 (hex) or 1111 1111 0010 0100 (binary) sent in the Facility Data Link	All units are removed from the armed state and loopbacks will be released
H2TU-C Network Loop-Up ¹	D3D3 (hex) or 1101 0011 1101 0011 (binary)	If received while in an armed state, the H2TU-C will loop toward the network, transmit 2 seconds of AIS (all 1s) followed by 5 seconds of loop code (D3 hex), and then 231 logic errors will be injected toward the network. The logic errors will continue to be sent in 231 bit error bursts every 20 seconds as long as the pattern continues to be detected by the H2TU-C. When the pattern is removed, the unit will remain in loopback.
Loopdown w/o disarm ²	9393 (hex) or 1001 0011 1001 0011 (binary)	All units currently in loopback will loop down and remain in the armed state if armed.
Loopback Query ⁴	D5D5 (hex) or 1101 0101 1101 0101 (binary)	Allows one to query the devices at any given time to determine whether any units are in loopback. If D5 hex is received while in a loopback state, the unit in question will transmit the logic error count toward the network using the same methodology as identified in each of the preceding loop-up descriptions (231 BE = H2TU-C, 200 BE = H2TU-R).
Loopback Time-Out Override ^{1,3}	D5D6 (hex) or 1101 0101 1101 0110 (binary)	If received during the armed state and prior to loopback initiation, the loopback timeout override feature will automatically disable loopback timeout, i.e., the loopback will not timeout after the 120 minute default period. As long as the units remain armed, the timeout will remain disabled. When the units are disarmed, the loopback timeout will once again return to the default value.
Span Power Disable ^{1,3}	6767 (hex) or 0110 0111 0110 0111 (binary)	If received during an armed state (H2TU-C must not be in loopback), the H2TU-C will remove span power toward the line. As long as the pattern is received, the span power will remain disabled. Once the pattern is no longer received, the H2TU-C will reactivate span power. All units will then re-train and return to the disarmed state.
Query Loop Parameters	DBDB (1101 1011 1101 1011)	If 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 signal quality and pulse attenuation parameters on each loop. 111 errors are injected if all HDSL2 receiver points (H2TU-C, NET LP, and H2TU-R LP) indicate pulse attenuation is 30 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 and/or signal quality (margin) is less than 6.
H2TU-R Address 20 for extended demarc:	C754 (1100 0111 0101 0100)	When sent from the network, an H2TU-R network loopback is activated and a 200-bit error confirmation is sent. 2 seconds of AIS (all 1s) will be sent, 5 seconds of data will pass, and then 200 bit errors will be injected into the DSX-1 signal. As long as the pattern continues to be sent 200 errors will be injected every 10 seconds. The HDSL2 office unit will not block transmission of far end NIU loopback from the customer premise (H2TU-R).

¹ Units must be armed with 11000b or FF48h before this code will work.

² In order to behave like an NIU, the H2TU-R will not loop down from the network side with 9393h.

³ This code will be detected only if the units are armed AND there are NO loopbacks active.

⁴ NOTE: All codes listed above must be sent for a minimum of 5 seconds in order for them to be detected and acted upon.

*If NIU is enabled, then the H2TU-R can be in network loopback when the H2TU-C loop-up codes are sent.

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.