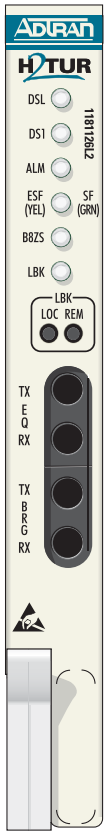
Total Access 3000/3010
H2TU-R

P/N: 1181126L2
CLEI: SIIA410F_ _



INTRODUCTION

The ADTRAN Total Access® 3000/3010 HDSL2 Transceiver Unit for the Remote End (H2TU-R, P/N 1181126L2) is a network terminating device that can deploy an HDSL2 T1 circuit using 2-wire metallic facilities. The H2TU-R fits any single-slot shelf in the Total Access 3000/3010 chassis (P/N 1181001L1 / P/N 1182003L1). The H2TU-R can be deployed in circuits that use one HDSL2 Transceiver Unit for the Central Office (H2TU-C) and one H2R.

INSTALLATION

After unpacking the unit, inspect it for damage. If damage is noted, file a claim with the carrier and then contact ADTRAN. Refer to the warranty for more information.

Mount the H2TU-R in any single slot of the Total Access 3000/3010 chassis. Amphenol connectors on the backplane of the Total Access 3000/3010 shelf allow access to the DS1 and HDSL2 signals. Pins 1 and 33 of each amphenol connector correspond to slot 1. Pins 2 and 34 of these connectors correspond to slot 2. Pins 3 and 35 correspond to slot 3, and so forth, up to pins 28 and 60 for slot 28.

- DS1 (Customer side) – Pair 7 and Pair 8
- HDSL2 (Network side) – Pair 2

Front Panel LEDs

Label	Status	Description
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)
	✷ Green Flashing	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.
	✷ Green Flashing	Detected error on the DS1 interface
	● Green	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	○ Off	DS1 is provisioned for AMI coding
	● Green	DS1 is provisioned for B8ZS 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
	✷ Yellow Flashing	Unit is armed but not in active loopback condition

Front Panel Switches

LBK REM Controls a customer loopback at the H2TU-C

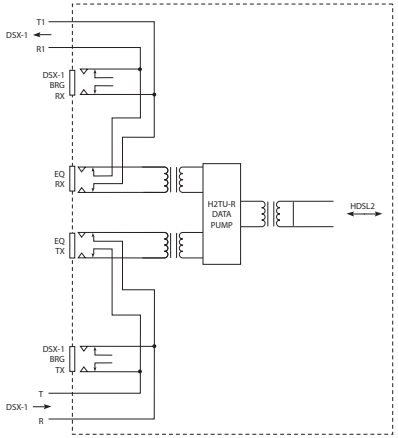
LBK LOC Controls a bidirectional loopback at the H2TU-R

Bantam Jacks

EQ TX, RX Provides an intrusive access point to the data stream being transmitted to (TX) and received from (RX), the H2TU-C.

BRG TX, RX The BRG (Bridging) jack provides nonintrusive access when connected to a bit-error rate test set that is configured for bridging mode. In this configuration, it is possible to observe sychronization, test patterns, and other functions.

The BRG jack can be used for intrusive testing toward the customer. In this configuration, the H2TU-R DS1 interface must be disconnected by using the metallic-splitting EQ jacks. Then, a test set configured for terminate mode can be connected to the BRG jacks, achieving test access toward the customer equipment.



PROVISIONING

The Total Access 3000/3010 shelf must have an Enhanced System Controller Unit (SCU). All provisioning, performance monitoring, and loopbacks are accessed through the SCU. The SCU has a faceplate-mounted DB-9 connector that supplies an RS-232 interface for connection to a VT100 or compatible controlling terminal. Set the terminal communication to 9600 bps, 8 data bits, no parity, and 1 stop bit.

1. At the Total Access 3000/3010 Login screen, enter the account name and password.
2. Select Access Modules from the Total Access Main Menu.
3. Access the desired H2TU-R by selecting the corresponding slot number.

Once these steps are completed, the HDSL2 Main Menu appears.

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 System Status screen) < 30 dB
- Maximum loop resistance is 900 ohms¶
- 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, refer to the *Supplemental Deployment Information for HDSL, HDSL2, and HDSL4 (HDSLx)* document (P/N 61221HDSLL1-10).

PRICING AND AVAILABILITY 800.827.0807
TECH SUPPORT 800.726.8663
RETURN FOR REPAIR 256.963.8722
www.adtran.com
61181126L2-22A

HDSL2-Loopback Control Codes

The H2TU-R responds to multiple loopback activation processes. The loopback position is a logic loopback located within the H2TU-R internal HDSL transceiver.

- Manual loopback activation is possible using the control port of the Total Access 3000/3010 SCU.
- The H2TU-R responds to HDSL2 loopback codes as defined in ANSI document T1.418-2002.
- The H2TU-R responds to manual loopback activation by pressing the LOC LBK button on the front panel. This activates a bidirectional loopback at the H2TU-R.
- The H2TU-R responds to T1 Network Interface Unit (NIU) loopback codes as described in Bellcore TR-TSY-000312 if the H2TU-R is optioned for NIU loopbacks.

Name	Code	Comments
Arming (In-band) Arming (ESF)	11000 0001 0010 1111 1111 (12 FF Hex)	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 loop-up, if NIU loopback is enabled.
Activation (H2TU-C) Activation (H2TU-R) Activation (H2R)	1101 0011 1101 0011 (D3D3 Hex) 1100 0111 0100 0010 (C742 Hex) 1100 0111 0100 0001 (C741 Hex)	Signal sent in-band. HDSL2 elements in armed state make transition to loop-up state. Loop-up state time-out is programmable from the H2TU-C. If an H2R is present and the units have been armed, the H2R will loop up toward the network (when sent from the network) or loop up toward the customer (when sent from the customer). Two seconds of AIS (all 1s) will be sent, five seconds of data will pass, and then ten bit errors will be injected into the DSX-1 signal. If the pattern continues to be sent, ten errors will be injected every twenty seconds. When the pattern is removed, the unit will remain in loopback. If the pattern is reinstated, the injection of ten bit errors will resume at twenty-second intervals.
Deactivation	1001 0011 1001 0011 (9393 Hex)	Signal sent in-band. HDSL2 element loop-up state makes transition to armed state.
Disarming (in-band) Disarming (ESF)	11100 0010 0100 1111 1111 (24FF Hex)	Signal sent in-band or over ESF data link. HDSL2 elements in any state make transition to disarmed state.
Arming Time-out	N/A	Time-out is two hours.
Loop-up Time-out	N/A	HDSL2 element in loop-up makes transition to armed state. Programmable from H2TU-C: None, 20, 60, or 120 minutes.
H2TU-R Network Loopback	1111 1111 0000 0010 (FF02 Hex)	Loopback data from network toward network at H2TU-R.
H2TU-R Customer Loopback	0011 1111 0000 0010 (3F02 Hex)	Loopback data from customer toward customer at H2TU-R.
Loopdown All Units	100 (1in3)	Loopback data from network toward network at H2TU-R.

TROUBLESHOOTING

Front panel or circuit parameters indicate normal operation, as follows:

Front Panel Indicators	
DSL	● Green
DS1	● Green
ALM	○ Off
LBK	○ Off

Circuit Parameters
♦ LOSS < 30 dB
♦ Good signal quality with no fluctuation
♦ All HDSL2 Deployment Guidelines are met

To check HDSL2 and T1 status, do the following:

1. Connect a terminal or PC to the RS-232 (DB-9) craft interface on the SCU front panel.
2. Select “3” from the ADTRAN HDSL2 Main Menu screen and “2” from the Span Status screen. This action displays the Detailed HDSL2 and T1 Status screen.

- Is the signal quality fluctuating (see MARGIN)? This condition occurs when real time mode is active.
- Is the pulse attenuation > 30 dB (see ATTEN)?
- Are there any errors counting on the ES, SES, or UAS registers (see ES, SES, and UAS)?

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CIRCUIT ID:                                                  MM/DD/YY hh:mm
                    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
           ATTEN(CUR/MAX):      30/30      28/28
                      ES 15MIN:   001        001
                     SES 15MIN:   000        001
                     UAS 15MIN:   014        017

                           T1 RECEIVER DATA
                        DSX-1                 DS1
                       -------               -------
              FRAMING:    SF                    SF
            LINE CODE:   B8ZS                  B8ZS
           ES-P/ES-L:  001/000               000/001       1. Zero Registers
         SES-P/SES-L:  001/000               000/000       2. Restart Min/Max
         UAS-P/UAS-L:  000/382               000/391
              ALARMS:  NONE                  NONE             Selection:
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If the answer is “Yes” to any of the above questions, the unit is not functioning properly. A cable problem or excessive loss situation is probable. There may also be intermittent cable faults or excessive noise impairments. Conduct more detailed cable testing to verify that all HDSL2 Loop Specifications are met. If intermittent faults or noise impairments are suspected, select “5” from the HDSL2 Main Menu to review the Performance History screen.

COMPLIANCE

Refer to the *Total Access 3000/3010 H2TU-R Compliance Notice* (P/N 61181126L2-17) for detailed compliance information.