239 H2R

P/N: 1223045L1
CLEI: T1R5ZP3D_ _

239 H2R
1223045L1

DSL ○ NET
DSL ○ CUST
LL ○ RL
(Y) (G)

ADTRAN

STATUS LEDS

Label	Status	Description
DSL NET	○ Off	No synchronization with the H2TU-C
	● Green	Synchronized with an SNR margin greater than the user defined SNR Margin Alarm Threshold
	✳ Green Flashing (3 per second)	Attempting to synchronize with the H2TU-C
	✳ Green Flashing (1 per second)	Synchronized with an SNR margin greater than the user defined SNR Margin Alarm Threshold and the pulse attenuation is greater than the user defined Loop Attenuation Alarm Threshold
	● Yellow	Synchronized with an SNR margin greater than 0 dB but less than the user defined SNR Margin Alarm Threshold
	✳ Yellow Flashing (1 per second)	Synchronized with an SNR margin greater than 0 dB but less than the user defined SNR Margin Alarm Threshold and the pulse attenuation is greater than the user defined Loop Attenuation Alarm Threshold
	● Red	Synchronized with an SNR margin of 0 dB
	✳ Red Flashing (1 per second)	Synchronized with an SNR margin of 0 dB and the pulse attenuation is greater than the user defined Loop Attenuation Alarm Threshold
DSL CUST	○ Off	No synchronization with the H2TU-R
	● Green	Synchronized with an SNR margin greater than the user defined SNR Margin Alarm Threshold
	✳ Green Flashing (3 per second)	Attempting to synchronize with the H2TU-R
	✳ Green Flashing (1 per second)	Synchronized with an SNR margin greater than the user defined SNR Margin Alarm Threshold and the pulse attenuation is greater than the user defined Loop Attenuation Alarm Threshold
	● Yellow	Synchronized with an SNR margin greater than 0 dB but less than the user defined SNR Margin Alarm Threshold
	✳ Yellow Flashing (1 per second)	Synchronized with an SNR margin greater than 0 dB but less than the user defined SNR Margin Alarm Threshold and the pulse attenuation is greater than the user defined Loop Attenuation Alarm Threshold
	● Red	Synchronized with an SNR margin of 0 dB
	✳ Red Flashing (1 per second)	Synchronized with an SNR margin of 0 dB and the pulse attenuation is greater than the user defined Loop Attenuation Alarm Threshold
LL/RL	● Green	Indicates a loopback at the H2R toward the H2TU-R is active
	● Yellow	Indicates a loopback at the H2R toward the H2TU-C is active

HDSL2 LOOP SPECIFICATIONS FOR OPTIMUM OPERATION
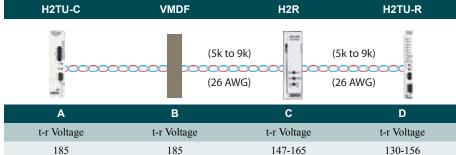
- Cable pairs must be non-loaded
- Total Bridged Tap < 2.5 kft
- Attenuation on HDSL2 Span Status Screen < 30 dB
- Impulse noise < 62 dBrnF
- No single Bridged Tap > 2 kft
- Maximum loop resistance is 850 ohms with 196 kHz Insertion loss < 35 dB
- Wideband Noise < 52 dBrnF

NOTE: For more information, refer to the "Supplemental Deployment Information for HDSL, HDSL2, and HDSL4 (HDSLx)" document (P/N: 61221HDSLL1-10).
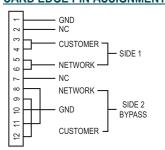
UNIT RESISTANCE

Measurements are with no power applied. (H2R 239 = High Impedance)

H2TU-C	VMDF	H2R	H2TU-R

(5k to 9k) (5k to 9k)
(26 AWG) (26 AWG)

A	B	C	D
t-r Voltage	t-r Voltage	t-r Voltage	t-r Voltage
185	185	147-165	130-156

ADTRAN 239 Repeater Housings

PART Number	Description	H2R Capacity	CLEI Code	Material
1150058L1	8-slot Air Stub	8	DDMOEEO1_ _	Stainless Steel
1150058L2	8-slot Gel Stub	8	DDMOFE01_ _	Stainless Steel

H2R 239 Deployment in Other Housings (819 Style)

Company	Description	H2R Capacity		Material
		Above Ground	Below Ground	
SPC/ADC Radiator II	16-slot Air Stub	16	16	Stainless Steel
SPC/ADC Radiator II	16-slot Gel Stub	16	16	Stainless Steel

CARD EDGE PIN ASSIGNMENTS

1 — GND
2 — NC
3 — CUSTOMER
4 —
5 — SIDE 1
6 — NETWORK
7 — NC
8 —
9 — NETWORK
10 — SIDE 2
11 — GND BYPASS
12 — CUSTOMER

COMPLIANCE

This product is intended to be installed in restricted access locations only. This product meets all requirements of Telcordia GR-1089-CORE (Class A2) and ANSI T1.418-2002, and is NRTL listed to the applicable UL standards.

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

ADTRAN®

239 H2R

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61223045L1-22B

LOOPBACK AND CONTROL CODES

Function	Code	Response
ARM (in-band)	11000 (binary)	The H2TU-C and H2R units arm, and the H2TU-R unit performs a loop-up toward the network.
ARM (ESF Data Link)	FF48 (hex) or 1111 1111 0100 1000 (binary) sent in the Facility Data Link	The H2TU-C and H2R units arm, and the H2TU-R unit performs a loop-up toward the network. The H2TU-R only performs a loop if the NIU option is enabled.
Disarm (in-band)	11100 (binary)	All units are removed from the armed state, and the loopbacks are 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 the loopbacks are 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 unit performs a loopback toward the network, transmits 2 seconds of AIS (all 1s) followed by 5 seconds of loop code (D3 hex), and then injects 231 logic errors toward the network. The logic errors are continued 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 remains in loopback.
Loopdown without disarming [2]	9393 (hex) or 1001 0011 1001 0011 (binary)	If received, automatically releases without disarming any H2TU-C and H2R units that may be in loopback toward the network.
Loopback Query [1]	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 transmits the logic error count toward the network using the same methodology as identified in each of the loop-up descriptions: • 231 BE = H2TU-C • 10 BE = H2R1 • 20 BE = H2TU-R
Query Loop Parameters	DBDB (1101 1011 1101 1011)	If the units are armed, and 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 HDSL receiver points (H2TU-C LP1/LP2, H2R #1 NET LP1/LP2, H2R #1 CST LP1/LP2, and H2TU-R LP1/LP2) indicate pulse attenuation is *less than or equal to* 30 dB and the signal quality (margin) is *greater than or equal to* 6 dB. • 11 errors are injected if any of the 12 receiver points indicate pulse attenuation is *greater than* 30 dB and/or the signal quality (margin) is *less than* 6 dB.
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 time-out override feature automatically disables loopback time-out (i.e., the loopback do not time-out after the 120 minute default period). As long as the units remain armed, the time-out remains disabled. When the units are disarmed, the loopback time-out once again returns to the default value.
Span Power Disable [1, 3]	6767 (hex) or 0110 0111 0110 0111 (binary)	If received during an armed state (must not be in loopback), the H2TU-C unit removes span power toward the line. As long as the pattern is received, the span power remains disabled. Once the pattern is no longer received, the H2TU-C unit reactivates span power. All units then re-train and return to the disarmed state.
H2R1 Network Loop-up [1]	C741 (1100 0111 0100 0001)	If an H2R is present and units armed, the H2R unit performs a loop up toward the network, 2 seconds of AIS (all 1s) are sent, 5 seconds of data is passed, and then 10 bit errors are injected into the DSX-1 signal. As long as the pattern continues to be sent, 10 errors are injected every 20 seconds. When the pattern is removed, the unit remains in loopback. If the pattern is reinstated, the injection of 10 bit errors resumes at 20-second intervals.
H2TU-R Loop-up [1]	C742 (1100 0111 0100 0010)	ESF facility Datalink: ESF only; when sent from the network, an H2TU-R network loopback is activated and a 20-bit error confirmation is sent. When sent from the customer, an H2TU-R customer loopback is activated with a 20-bit error confirmation.

1. Units must be armed with 11000b or FF48h for this code to work.

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

3. This code is detected only if the units are armed **and** there are **no** loopbacks active.

Notes: 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, the H2TU-R can be in network loopback when the H2TU-C or H2R loop-up codes are sent.