

239 H2R

CLEI: T1R6VJWD_ _



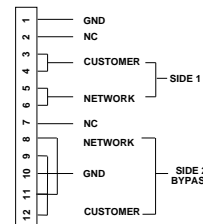
STATUS LEDs

- DSL NET**
- Off No synchronization with the H2TU-C
 - Solid Green Synchronized with an SNR margin greater than the user defined SNR Margin Alarm Threshold
 - * Fast Blinking Green (Blinking 3 times per second) Attempting to synchronize with the H2TU-C
 - * Slow Blinking Green (Blinking 1 time 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
 - Solid Yellow Synchronized with an SNR margin greater than 0 dB but less than the user defined SNR Margin Alarm Threshold
 - * Slow Blinking Yellow (1/sec) 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
 - Solid Red Synchronized with an SNR margin of 0 dB
 - * Slow Blinking Red (Blinking 1 time 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
 - Solid Green Synchronized with an SNR margin greater than the user defined SNR Margin Alarm Threshold
 - * Fast Blinking Green (Blinking 3 times per second) Attempting to synchronize with the H2TU-R
 - * Slow Blinking Green (Blinking 1 time 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
 - Solid Yellow Synchronized with an SNR margin greater than 0 dB but less than the user defined SNR Margin Alarm Threshold
 - * Slow Blinking Yellow (1/sec) 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
 - Solid Red Synchronized with an SNR margin of 0 dB
 - * Slow Blinking Red (Blinking 1 time 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

ENHANCED PSD

The Enhanced PSD 239 H2R, P/N 1221045L2, must be used in conjunction with the Enhanced PSD T200 H2TU-R, P/N 1222026L9. This H2R will not function with any other H2TU-Rs. The Enhanced PSD T200 H2TU-R will function with all versions of the ADTRAN H2R, but the enhanced spectral performance will only be achieved using the Enhanced PSD 239 H2R.

CARD EDGE PIN ASSIGNMENTS



LOOPBACK AND CONTROL CODES

FUNCTION	CODE	RESPONSE
ARM (in-band)	11000 (binary)	H2TU-C and H2R 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 and H2R will arm and the H2TU-R will loop-up toward the network H2TU-R will only loop if the NIU option is enabled
Disarm (in-band)	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/out disarming ²	9393 (hex) or 1001 0011 1001 0011 (binary)	Automatically releases without disarming any H2TU-C and H2R 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 will transmit 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, 200 BE = H2R2 and 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, H2R #2 NET LP1/LP2, H2R #2 CST LP1/LP2, and H2TU-R LP1/LP2) indicate pulse attenuation is 30 dB or lower and signal quality (margin) is 6 dB or higher. 11 errors at a time are injected if any of the 12 receiver points indicate pulse attenuation is greater than 30 dB and/or 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 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 (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.
H2R1 Network Loop-up ¹	C741 (1100 0111 0100 0001)	If an H2R is present and units armed, the H2R will loop up toward network, 2 seconds of AIS (all 1s) will be sent, 5 seconds of data will pass, and then 10 bit errors will be injected into the DSX-1 signal. As long as the pattern continues to be sent, 10 errors will be injected every 20 seconds. When the pattern is removed, the unit will remain in loopback. If the pattern is reinstated, the injection of 10 bit errors will resume 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 before this code will work.

² In order to behave like a 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.

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 or H2R loop-up codes are sent.

HDSL2 LOOP SPECIFICATIONS FOR OPTIMUM OPERATION

First Segment (Between the H2TU-C and H2R)

- Cable pairs must be non-loaded
- No single Bridged Tap > 2 kft
- Total Bridged Tap < 2.5 kft
- Maximum loop resistance is 850 Ω with 196 kHz Insertion loss < 35 dB
- Pulse attenuation (LOSS on HDSL Current System Status Screen) ≤ 30 dB
- SNR Margin of 6 dB or higher, with no fluctuation on either loop
- Impulse noise ≤ 50 dB_{rn} as measured using a 50 kb filter
- Wideband Noise ≤ 31 dB_{rn} as measured using a 50 kb filter
- Internal Clock Accuracy ±25 ppm (exceeds Stratum 4)

Second Segment (Between the H2R and H2TU-R)

- Cable pairs must be non-loaded
- No single Bridged Tap > 2 kft
- Total Bridged Tap < 2.5 kft
- Maximum loop resistance is 740 Ω with 196 kHz Insertion loss < 31.25 dB
- Pulse attenuation (LOSS on HDSL Current System Status Screen) ≤ 27 dB
- SNR Margin of 6 dB or higher, with no fluctuation on either loop
- Impulse noise ≤ 50 dB_{rn} as measured using a 50 kb filter
- Wideband Noise ≤ 31 dB_{rn} as measured using a 50 kb filter
- Internal Clock Accuracy ±25 ppm (exceeds Stratum 4)

UNIT RESISTANCE

Measurements are with no power applied

H2R 239 = Open circuit

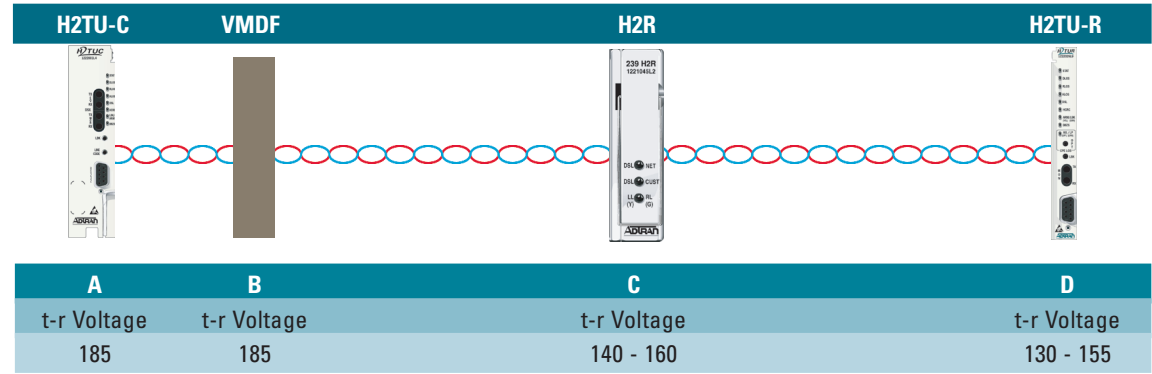
WARRANTY

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 faxback copy of ADTRAN's U.S. and Canada Carrier Networks Equipment Warranty: (877) 457-5007, Document # 414.

COMPLIANCE

This product complies with UL 1950, third edition. It is intended for installation in restricted access locations only and in equipment with a Type "B" or "E" installation code. Ensure chassis ground is properly connected.

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



ADTRAN 239 REPEATER HOUSINGS

PART #	Description	H2R Capacity	CLEI CODE*	Material
1150027L1	4-slot Air Stub	TBD*	DDM0ABA1MA	Stainless Steel
1150027L2	4-slot Gel Stub	TBD*	DDM0BBA1MA	Stainless Steel
1152010L3	2-slot Gel Stub	TBD*	DDM0BAE1RA	Valox Plastic
1152010L4	2-slot Air Stub	TBD*	DDM0AAE1RA	Valox Plastic
1150057L1	4-slot Air Stub	TBD*	DDM0DA01RA	Stainless Steel
1150057L2	4-slot Gel Stub	TBD*	DDM0CA01RA	Stainless Steel
1150058L1	8-slot Air Stub	8	DDM0EE01RA	Stainless Steel
1150058L2	8-slot Gel Stub	8	DDM0FE01RA	Stainless Steel
1190816L1	16-slot Air Stub	TBD*	DDM0ES01RA	Stainless Steel
1190816L2	16-slot Gel Stub	TBD*	DDM0FS01RA	Stainless Steel

H2R 239 DEPLOYMENT IN OTHER HOUSINGS

Company	Description	H2R Capacity		Material
		Above Ground	Below Ground	
819 Style				
AT&T, Keptel, ABACON	25-slot	TBD*	TBD*	Polymer
SPC/ADC Radiator II	16-slot Air Stub	16	16	Stainless Steel
SPC/ADC Radiator II	16-slot Gel Stub	16	16	Stainless Steel
AT&T, Keptel	12-slot Air Stub	TBD*	TBD*	Polymer
ABACON	12-slot Air Stub	TBD*	TBD*	Polymer
ABACON	12-slot Gel Stub	TBD*	TBD*	Polymer
ABACON	16-slot Air Stub	TBD*	TBD*	Polymer
ABACON	16-slot Gel Stub	TBD*	TBD*	Polymer
820 Style				
Antec/Arris	8-slot Air Stub	TBD*	TBD*	Polymer

*H2R capacity testing is in progress, and results will be available in Q4 2001.