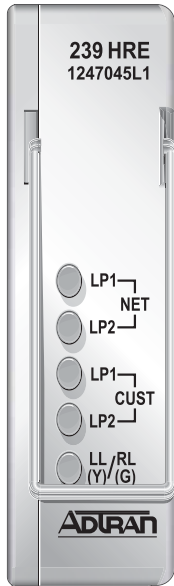


## HDSL 239 HRE

P/N: 1247045L1  
CLEI: T1RPAACB\_ \_



### INTRODUCTION

The ADTRAN 239 T1 HDSL Range Extender (239 HRE, P/N 1247045L1) extends the effective range of an HDSL-based T1 circuit.

The 239 HRE can effectively double the deployment range of standard HDSL and provide carrier service area (CSA) compliant loops on both sides of the range extender. The 239 HRE extends the digital subscriber loop serving range up to 36 kft over 24-AWG twisted wire, and is used in conjunction with any span-powering T1 HDSL transceiver unit for the central office (HTU-C) and low voltage HDSL transceiver unit for the remote end (HTU-R).

- ◆ The 239 HRE fits in all standard 239 and 819 repeater housings.
- ◆ There are no option settings on the 239 HRE.
- ◆ One or two 239 HREs may be powered from the 190V span-powering HTU-C.

### FRONT PANEL LEDs

Label	Status	Description
NET LP1/LP2	○ Off	Loss of power to the HRE or no sync with the next upstream device (HTU-C / HRE#1)
	● Green	Sync with good signal quality (> 7)
	● Yellow	Sync with marginal signal quality (1 to 7)
	● Red	Sync with poor signal quality (0)
	⊛ Flashing	Fast yellow flash for NET LP1 when span powering present, but no synchronization. If the pulse attenuation (LOSS on Current System Status Screen) is above 30 dB or a CRC error was received at the NET LP1 / LP2 receiver, the <b>NET LP1 / LP2</b> LED flashes green, yellow, or red, as determined by the signal quality. If the pulse attenuation is above 30 dB and a CRC error was received at the same time, the LED flashes twice as fast.
CUST LP1/LP2	○ Off	No sync with the next downstream device (HTU-R / HRE#2) on CUST LP1 / LP2
	● Green	Sync with good signal quality (> 7)
	● Yellow	Sync with marginal signal quality (1 to 7)
	● Red	Sync with poor signal quality (0)
	⊛ Flashing	If the pulse attenuation (LOSS on Current System Status Screen) is above 30 dB or a CRC error was received at the CUST LP1 / LP2 receiver, the <b>CUST LP1 / LP2</b> LED flashes green, yellow, or red, as determined by the signal quality. If the pulse attenuation is above 30 dB and a CRC error was received at the same time, the LED flashes twice as fast.
LL/RL	● Green	Unit is looped toward the HTU-R
	● Yellow	Unit is looped toward the HTU-C

*NOTE: The HTU-C and HREs (if deployed) governs loopback control codes. The use of standard or enhanced loopback codes depends on the type of HTU-C deployed. For detailed information, refer to the "HDSL 239 HRE Installation and Maintenance Practice" (P/N 61247045L1-5).*

### ADTRAN 239 REPEATER HOUSINGS

Part Number	Description	HRE Capacity	CLEI	Material
1150027L1	4-Slot Air Stub	4	DDMOABA1MA	Stainless Steel
1150027L2	4-Slot Gel Stub	4	DDMOBBA1MA	Stainless Steel
1152010L3	2-Slot Gel Stub	2	DDMOBAE1RA	Valox Plastic
1152010L4	2-Slot Air Stub	2	DDMOAAE1RA	Valox Plastic
1150057L1	4-Slot Air Stub	4	DDMODA01RA	Stainless Steel
1150057L2	4-Slot Gel Stub	4	DDMOCOA01RA	Stainless Steel
1150058L1	8-Slot Air Stub	8	DDMOEE01RA	Stainless Steel
1150058L2	8-Slot Gel Stub	8	DDMOFE01RA	Stainless Steel

### 239 HRE DEPLOYMENT IN OTHER HOUSINGS

Company	Description	HRE Capacity		Material
		Above Ground	Below Ground	
AT&T 819	25-Slot	12	16 *	Polymer
SPC	6-Slot	5	6	Stainless Steel
SPC	8-Slot	5	6	Stainless Steel
AT&T 820	8-Slot Air Stub	7	8	Stainless Steel
AT&T 809	12-Slot Air Stub	6	N/A	Polymer
AT&T 841C	100-Slot	42	N/A	Stainless Steel

\* Up to 16 units can be loaded inside the 819 housing for all below ground mounting orientations. If the 819 housing is mounted specifically in the vertical, stub down direction, 18 units can be loaded in slots 1, 3, 5, 7, 8, 10, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 24, and 25.



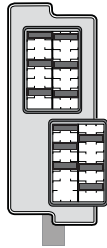
**CAUTION!**  
SUBJECT TO ELECTROSTATIC DAMAGE  
OR DECREASE IN RELIABILITY.  
HANDLING PRECAUTIONS REQUIRED.

## HOUSING DIAGRAMS

ADTRAN 8-Slot  
Above Ground



AT&T/Keptel/ABACON 819  
Above Ground



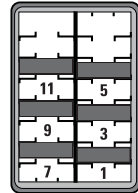
1, 4, 7, 8, 11, 14, 15,  
17, 19, 20, 23, 25

AT&T/Keptel/ABACON 819  
Below Ground



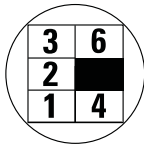
1, 3, 5, 7, 8, 10, 12, 14, 15,  
16, 18, 19, 20, 22, 24, 25

AT&T/Keptel 809  
Above Ground

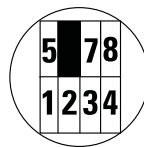


1, 3, 5, 7, 9, 11

SPC 6-Slot  
Below Ground



SBC 8-Slot  
Above Ground



## INSERTION LOSS MEASUREMENTS

Frequency (kHz)	Maximum Loss Data (dB)
10000	15.00
50000	25.50
100000	30.00
150000	32.75
196000	35.00
200000	35.25
250000	37.50
325000	42.00

**NOTE:** If TIMs is unable to transmit 200 kHz tone, set it to one of the frequencies shown above and compare the received signal to the maximum loss at that frequency.

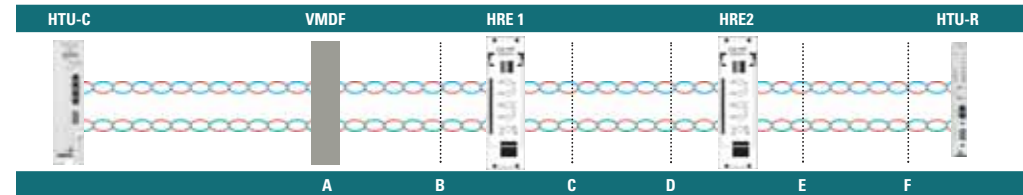
## HDSL LOOP SPECIFICATIONS FOR OPTIMUM OPERATION

- ◆ Cable pairs must be non-loaded
- ◆ No single Bridged Tap > 2 kft
- ◆ Maximum loop resistance is 800 Ω
- ◆ Pulse attenuation (LOSS on HDSL Current System Status screen) ≤ 30 dB
- ◆ Impulse noise ≤ 50 dBm as measured using a 50 kb filter
- ◆ Total Bridged Tap < 2.5 kft
- ◆ 196 kHz insertion loss ≤ 35 dB
- ◆ Signal quality of 6 or higher, with no fluctuation and equal on both loops
- ◆ Wideband Noise ≤ 31 dBm as measured using a 50 kb filter
- ◆ Internal Clock Accuracy +25 ppm (exceeds Stratum 4)

## UNIT RESISTANCE

The following unit resistance measurements are with no power applied:

- ◆ HTU-C (3192, 220, or DDM+) = 6.2 Ω to 7 Ω
- ◆ HTU-R (T200) = 6.2 Ω to 7 Ω
- ◆ HRE (239, T200) ≈ 6.6 Ω toward NET or CUST



	A t-t V	B t-t V	C t-t V	D t-t V	E t-t V	F t-t V
Open at frame	180-185	N/A	N/A	N/A	N/A	N/A
HTU-C with HTU-R	180-185	N/A	N/A	N/A	N/A	175-180
HTU-C with HRE / HTU-R	180-185	165-170	165-170	N/A	N/A	155-160
HTU-C with HRE 1 / HRE 2 / HTU-R	180-185	150-155	150-155	125-130	125-130	115-120

**NOTE:** The tip-to-tip voltage measurements are based on 9 kft of 26 AWG for each segment.

## COMPLIANCE

Refer to the [HDSL 239 HRE Compliance Notice \(P/N 61247045L1-17\)](#) for detailed compliance information.

**Warranty:** ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found online at [www.adtran.com/warranty](http://www.adtran.com/warranty).