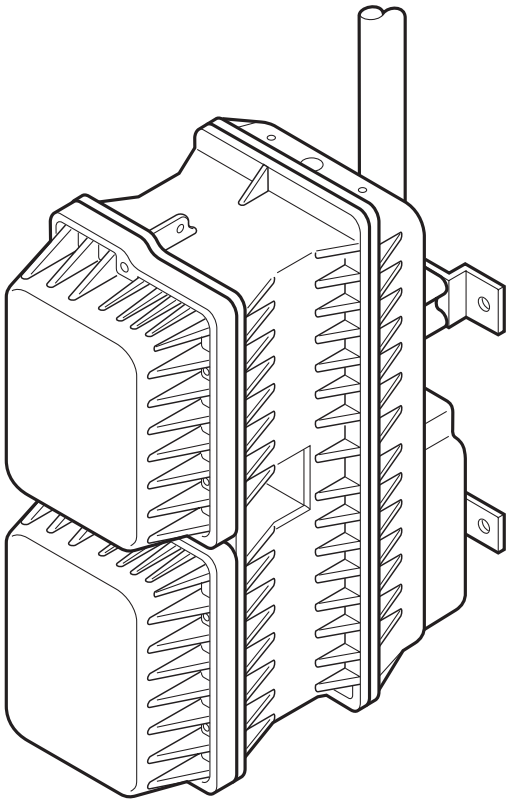
HiGain Outdoor Doubler Enclosure



HRE-819 List 1 and List 2
Product Catalog: 150-819-100-03
CLEI: T1RHEE04 and T1RHEF04

Revision History of This Manual

Revision	Release Date	Revisions Made
01	February 2, 1998	Initial release
02	July 9, 1998	New illustrations, modifications to text.
03	October 14, 2002	ADC rebranding

CONVENTIONS USED IN THIS SPECIFICATION

Two types of messages, identified by icons, may appear in the text:

Notes contain information about special circumstances.

Cautions indicate the possibility of equipment damage or personal injury.

INSPECTING SHIPMENT

Upon receipt of the equipment:

- Unpack each container and visually inspect it for signs of damage. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company and to ADC. Order replacement equipment, if necessary.
- Check the packing list to ensure complete and accurate shipment of each listed item. If the shipment is incomplete or irregular, contact ADC as described in the Warranty. If you must store the equipment for a prolonged period, store the equipment in its original container.

TABLE OF CONTENTS

OVERVIEW

This document describes the ADC® HiGain® Outdoor Mini and Micro Doubler Enclosures HRE-819 List 1 and HRE-819 List 2. The primary application of the HRE-819 enclosure is to house HiGain Doubler units in a HiGain repeaterless T1 transmission system. The HRE-819 is either a refurbished or originally manufactured AT&T outdoor enclosure that has been enhanced to house up to:

- Twelve HiGain full-payload, T1 doublers (HDU-439 or HDU-409) or
- Twelve fractional T1 doublers (HDU-219) or
- Twelve 239 T1 repeaters or
- Twelve of any combination of these units

The cap, coil, filter, and type B protector functions are not supported.

ENHANCED FEATURES

The HRE-819 has enhanced the standard AT&T 819 enclosure case in the following ways:

- Twelve, double-wide T1 239 slots for doublers or T1 repeaters
- Modified single 30-foot stub (54 pair, four group, quad S-screened)
- Enhanced thermal dissipation capabilities

STANDARD FEATURES

- Rack-mount or pole mount capability
- Primary surge suppression across all ports in every slot
- Support for pressure contactor alarm card

DESCRIPTION

The HRE-819 List 1 is an AT&T-equivalent 819B1 or 819B2 outdoor enclosure with a gel-filled stub. The HRE-819 List 2 is an AT&T-equivalent 819A1 or 819A2 outdoor enclosure with an air-filled stub. Figure 1 shows the HRE-819.

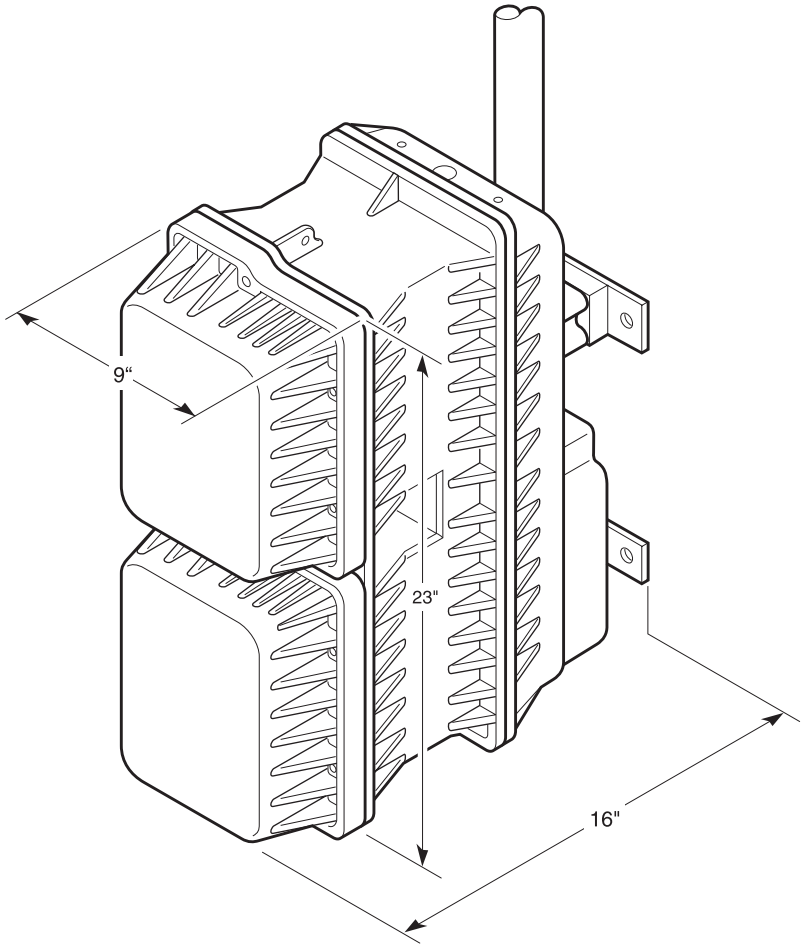


Figure 1. *HRE-819 Outdoor Doubler Enclosure*

Mechanics

The HRE-819 mechanics comply with standard AT&T 819 enclosure cases. The HRE-819 case (Figure 2 on page 3) is composed of three basic subassemblies:

- An 81-type enclosure base
- A protected 89-type enclosure housing
- Removable access lids

The housing has two separate chambers. Each chamber has six double-wide slots and is accessed by a removable lid. The HRE-819 family includes two types of lids and four types of bases. Table 1 on page 3 lists the type of lids and bases and shows which ones are used for the HRE-819 List 1 and the HRE-819 List 2.

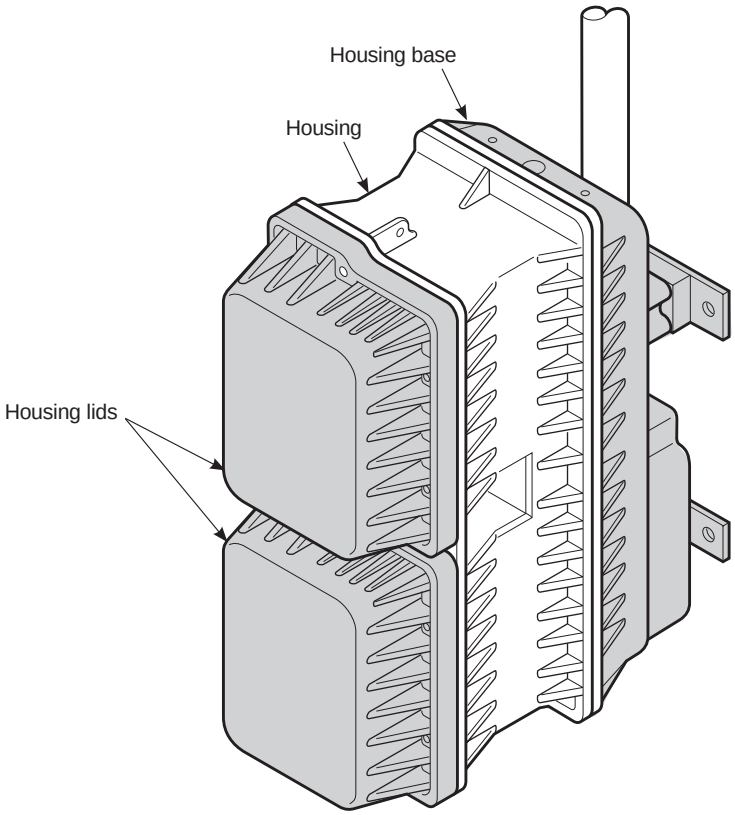


Figure 2. *Enclosure Base and Housing*

Table 1. *HRE-819 Mechanics*

	LID		BASE			
HRE-819 List Number	**2-inch AT&T #842301483**	**3.5-inch AT&T #842301491**	**81B1-1H**	**81A1-1H**	**81A1-2H**	**81A2-2H**
HRE-819 List 1, Gel	X	X	X			
HRE-819 List 2, Air	X			X	X	X

You can build the gel-filled List 1 unit with two regular-sized lids (a 2-inch deep, AT&T #842301483) or two deep-dish lids (a 3.5-inch, AT&T 842301491). The List 1 requires an 81B1-1H base since it does not have an air bypass valve.

You can build the air-filled List 2 unit only with the 2-inch deep lid and either the single-stub base (81A1-1H) or a dual-stub base (81A1-1H or 81A2-2H). When you use a dual-stub base, the stub access opening adjacent to the air cutoff valve is plugged.

Enclosure Base

The HRE-819 enclosure base is a molded plastic unit. The base contains the air bypass valve, pressure relief valve, order wire port, stub cable, and mounting hardware.

In the event of damage to the housing, the housing can be detached from the base and replaced. This precludes the need to blow the splice case and resplice a new unit stub into the main feeder cables. Whenever the base and housing are separated and then reattached, torque the connecting bolts to 40 inch-pounds in the sequence shown in Figure 3.

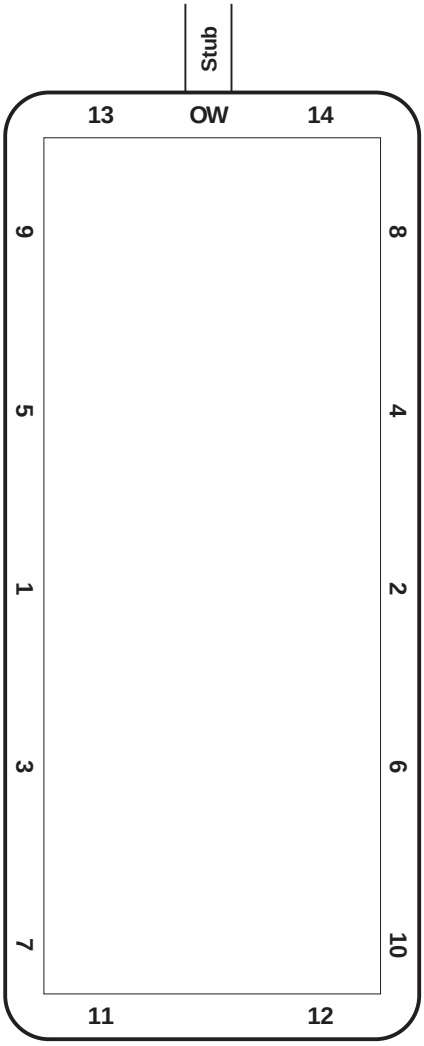


Figure 3. *Sequence for Torquing the Base Connecting Bolts*

Enclosure Housing

The enclosure housing (Figure 4 on page 5) is a molded plastic unit which has two separate chambers. Each chamber has six double-wide slots and a slot for the maintenance pressure contactor plug. Each plug-in slot contains connectors that accommodate both the plug-in unit and its associated protectors.

Seal the housing covers to the housing with a reusable gasket, which forms an airtight seal when the lid bolts are properly torqued to 40 inch-pounds in the sequence inscribed on the lid (Figure 4 on page 5).

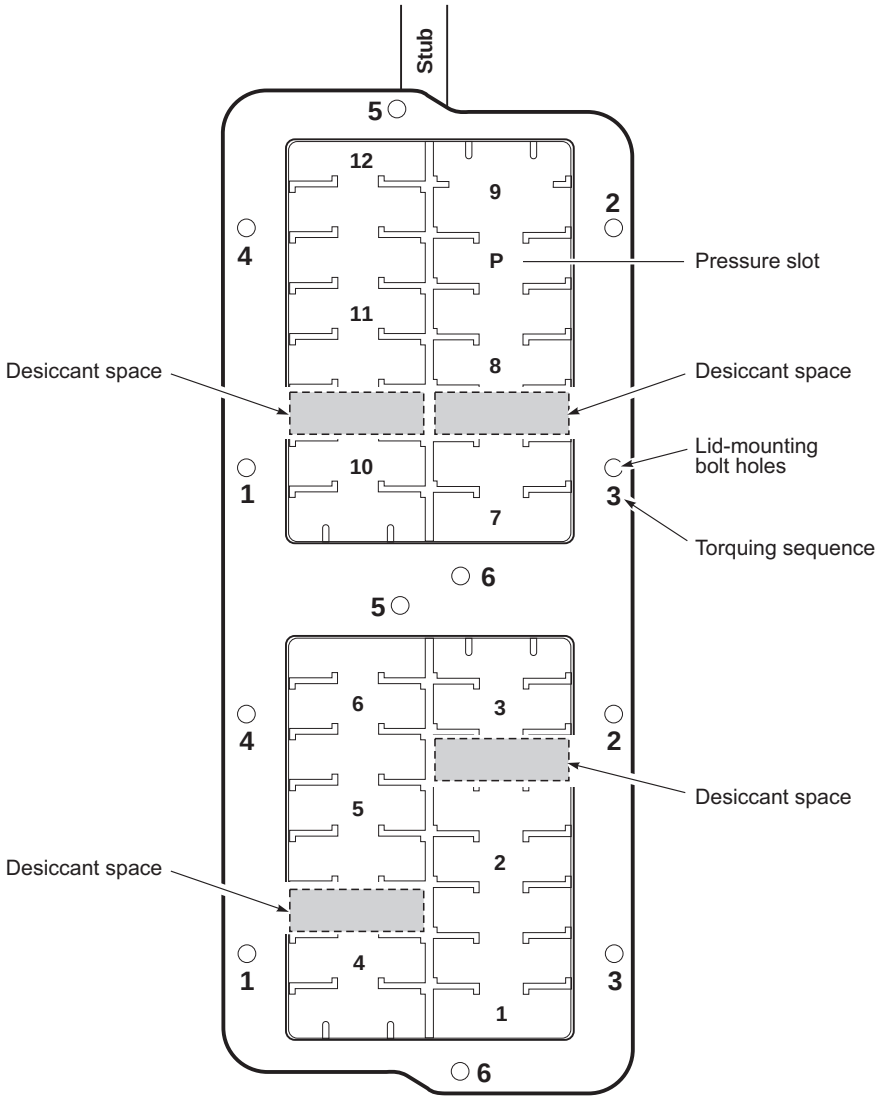


Figure 4. *HRE-819 Housing*

Gel-filled Stub - HRE-819 List 1 Only

The gel-filled, screened, 54-pair, 24-AWG cable stub on the List 1 unit is equivalent to an ALP FSS-PIC filled-core telephone cable. It has a foam skin insulation with a single, filled jacket intended for buried, aerial, and duct applications. Each conductor has a dual insulation consisting of an inner coating of natural, insulating-grade, high-density, cellular polyethylene covered by an outer skin of color-coded, high-density, solid polyethylene. Standard color codes are used for pair identification with color compounds chosen for electrical balance and permanency (See Figure 9 on page 12). The cable complies with the requirements of ANSI/ICEA S-84-608-1994. The outside diameter of the cable is 0.85 inches.

Air-filled Stub - HRE-819 List 2 Only

The plastic-insulated single-jacketed air-core cable stub on the List 2 unit is intended for buried, aerial, and duct applications. Conductors are insulated with solid, high-density polyethylene. Standard color codes are used for pair identification with color compounds chosen for electrical balance and permanency. The cable complies with the requirements of ANSI/ICEA S -85-625-1996. The outside diameter of the cable is 0.85 inches.

Pressurization

Figure 5 shows the pressurization valves. One of the most noticeable external differences between the two enclosures is that the air bypass valve is absent from the gel-core model, HRE-819 List 1.

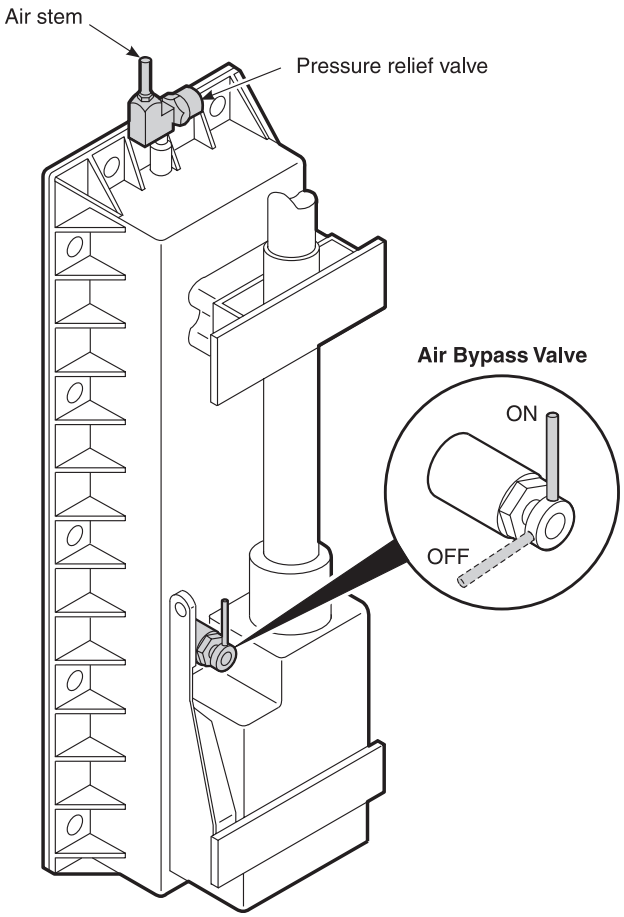


Figure 5. *Pressurization Valve Locations*

Air Bypass Valve

List 1 enclosures (gel-filled stub) are intended for above-ground applications and applications requiring the stub to be spliced to non-pressurized, air core cables. Therefore, the List 1 enclosures do not have an air bypass valve.

List 2 enclosures (air-filled stub) are intended for man-hole applications. The List 2 enclosures are equipped with an air bypass valve which is used to retain static pressure within the base and to control the inlet air supply that is pumped from the main feeder cable through the 30-foot (9.144 M) stub into the HRE-819 enclosure.

- To shut off the inlet air supply, turn the air bypass valve counter-clockwise one-quarter turn away from the housing.
- To turn on the inlet air supply, turn the air bypass valve clockwise one-quarter turn towards the housing.

Pressure-relief Valve and Air Stem

The pressure-relief valve keeps the internal pressure between 12 and 25 PSI. The air stem is a threaded Schraeder valve (similar to a car tire valve) and cap. Use it to pressurize the enclosure from a local pressure source or to measure the enclosure's internal pressure through a pressure gauge or to relieve the internal pressure prior to opening and removing the cover by removing the air stem valve core (pin).

List 1 and List 2 units are filled with nitrogen and pressurized before shipment. The internal pressure must be relieved every time the cover is removed from the units. Failure to do so may cause personal injury or equipment damage. Before shipment, the List 2 stub is also pressurized, separately from the enclosure, through an air stem valve located in the end of the stub.

INSTALLATION

This section describes the unpacking and installation procedures for the HRE-819 List 1 and 2.

UNPACKING

1 Remove the HRE-819 from its shipping carton.

2 Inspect the enclosure for shipping damage and report any damage to the carrier immediately.

3 Perform an inventory to verify that all equipment listed on the packing list is present.

- HTC -439 test card
- HTC-439 technical practice
- Hardware installation kit containing:

  Four $^{1}/_{2}$-13 x 1-$^{1}/_{2}$ T-bolts

  Four $^{1}/_{2}$-13 hex nuts

  Four $^{17}/_{32}$ I.D. flat washers

  Two $^{1}/_{4}$-20 x $^{7}/_{16}$ shoulder screws

  Two mounting brackets

An HTC-439 ADC test card is included with every HRE-819. This unit is found in a separate box inside the HRE-819 shipping carton. The test card provides an easy-to-use way of accessing and testing the four cable pairs connected to every HRE-819 slot. The test card is provided free of charge for your convenience.

INSTALLING THE ENCLOSURE

Manhole Installation

The enclosure base has mounting brackets with four $^{9}/_{16}$-inch diameter mounting holes spaced 13-$^{1}/_{2}$ inches vertically by 7-$^{1}/_{2}$ inches horizontally. The hole spacing is consistent with the mounting slot spacing of standard manhole racks.

1 Lower the housing and attached stub cable into the manhole.

2 Install and secure the base on cable racks as shown in Figure 6. The order wire terminal is located at the stub cable end of the base unit. When cases are mounted in tight quarters, be sure to mount the case so that this terminal is easily accessible.

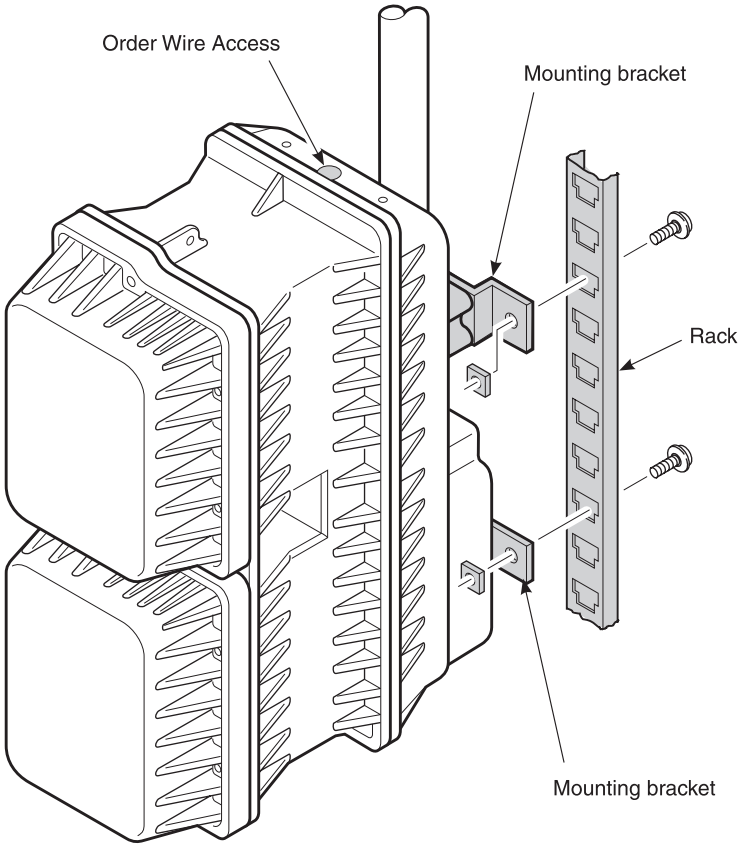


Figure 6. *Manhole Installation*

Aerial Installation

To mount the doubler enclosure on a pole, use a 131B T-bracket and mounting bar assembly (ADC Part Number 132-1026-01), as shown in Figure 7. This assembly allows the case to be mounted with the stub cable up or down.

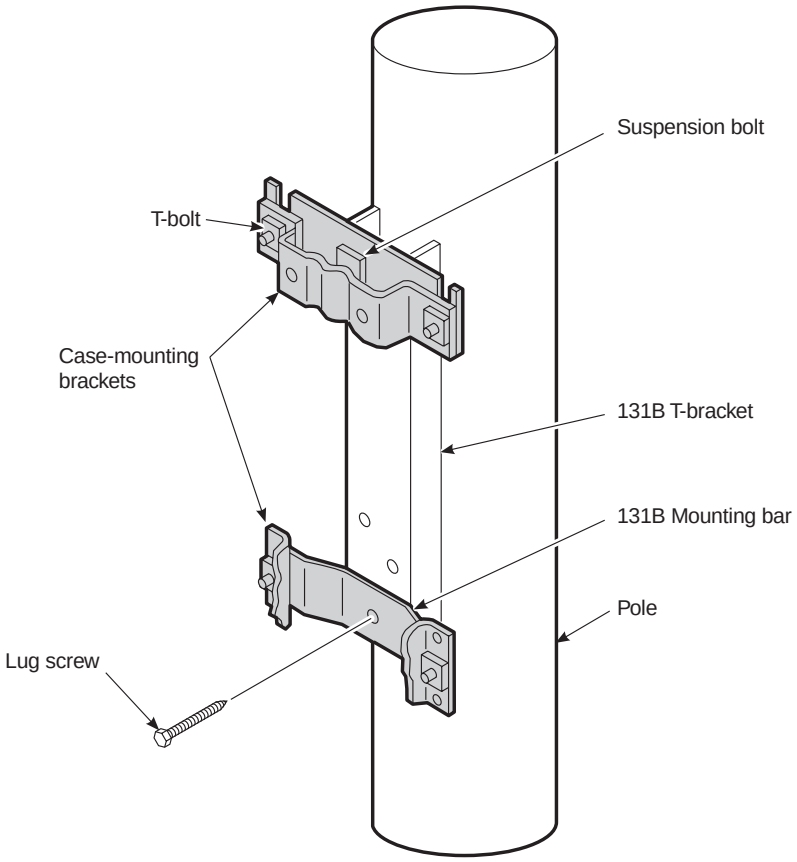


Figure 7. *Vertical Pole Mounting at an Aerial Location*

1 Loosely install two of the T-bolts, nuts, and washers in one of the case-mounting brackets.

- For mounting with stub up, install these bolts in the mounting bracket closest to the stub.
- For mounting with stub down, install these bolts in the mounting bracket farthest from the stub. The bolts engage the slots of the upper bar of the 131B T-bracket and support the case while you are installing the lower mounting bolts.

2 Select a place for the 131B T-bracket. It can be mounted at any height on a pole, preferably near the aerial cable or approximately 6 feet above ground level for easy access when used with buried or underground cable.

All necessary bolts, nuts and washers are included in the hardware installation kit.

3 Drill a $^{3}/_{4}$-inch diameter hole through the pole at the selected height.

4 Use the $^{5}/_{8}$-inch diameter suspension bolt, plus curved washers and a square nut, to fasten the top of the 131B T-bracket to the pole through the $^{3}/_{4}$-inch hole.

5 Use the $^{1}/_{2}$-inch lug screw at the bottom to fasten the mounting bar to the T-bracket and to keep the 131B T-bracket vertical on the pole.

6 Lift the case. (The recommended way to lift the case is to use a sling attached through the opening in the doubler enclosure.) Secure the case to the mounting bracket with the four T-bolts.

7 Splice the stub. (See "Splicing the Stub Cable" on page 11). Enclosure cases mounted above ground can be spliced to either air-filled core cable or gel-filled core cable.

- Enclosure cases spliced to air-core cable should be maintained under pressure from the cable. (See "Pressurization" on page 6.)
- Enclosure cases spliced to gel-filled cable above ground can be left unpressurized except in flood areas where static pressurization is recommended. (See "Air Bypass Valve" on page 6.)

8 Ground the enclosure.
All pole-mounted doubler enclosures must be grounded. Install a No. 6 AWG copper ground wire between the case mounting bracket farthest from the stub cable and a 5-foot ground rod driven into the ground.

Doubler enclosure stubs with shields bounded to a properly grounded main cable shield do not require this additional ground wire. Noise due to ground loops could occur if the case is grounded both places.

SPLICING THE STUB CABLE

1 Locate the splice case.

2 Prepare the cable sheaths to prevent sharp edges from damaging the DEPIC insulation according to the following steps. Figure 8 on page 12 shows the splice preparation. Figure 9 on page 12 shows the cross section of the stub.

Ensure that the stub cable is properly bonded to the shield of the main cable if this is the only means by which the double case is grounded.

The stub's screen should not be grounded nor should it be connected to other screens.

a Cut the screen to length.

b Flatten the screen as shown in Figure 8 on page 12.

c Fold the end of the screen on itself three times.

d Reform the screen (unflatten) around the binder unit.

e Wrap the folded end of screen with vinyl tape.

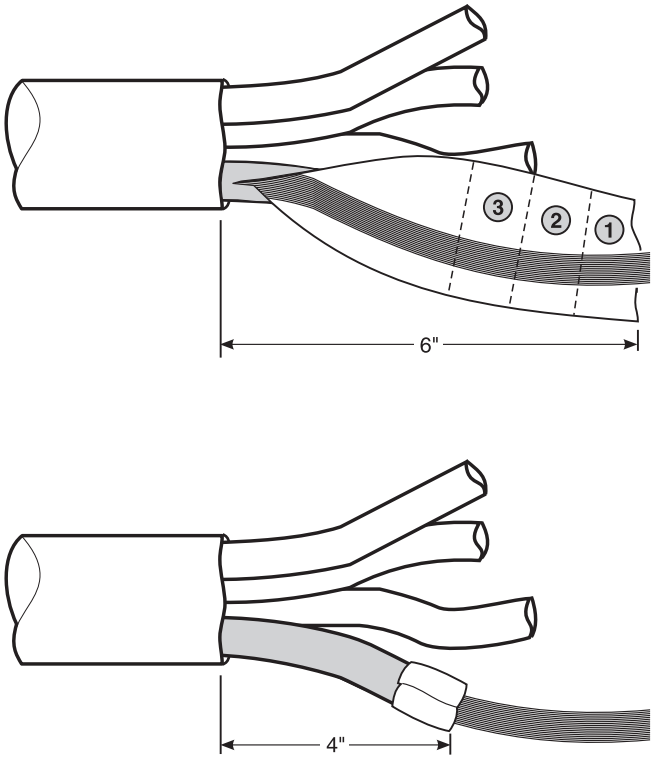


Figure 8. *Splice Preparation*

3 Before splicing the stub cable to the main cable, test all cable pairs designated for immediate or future use for pair continuity and pair identification.

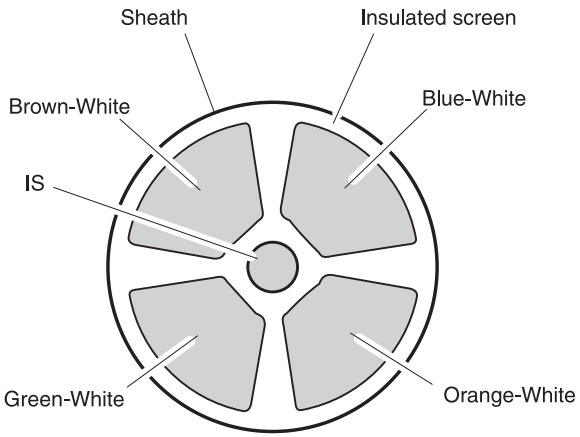


Figure 9. *Cross Section of Quad S-Screened Stub at Splice*

4 Splice the stub cable to the main cable as outlined in Figure 10.

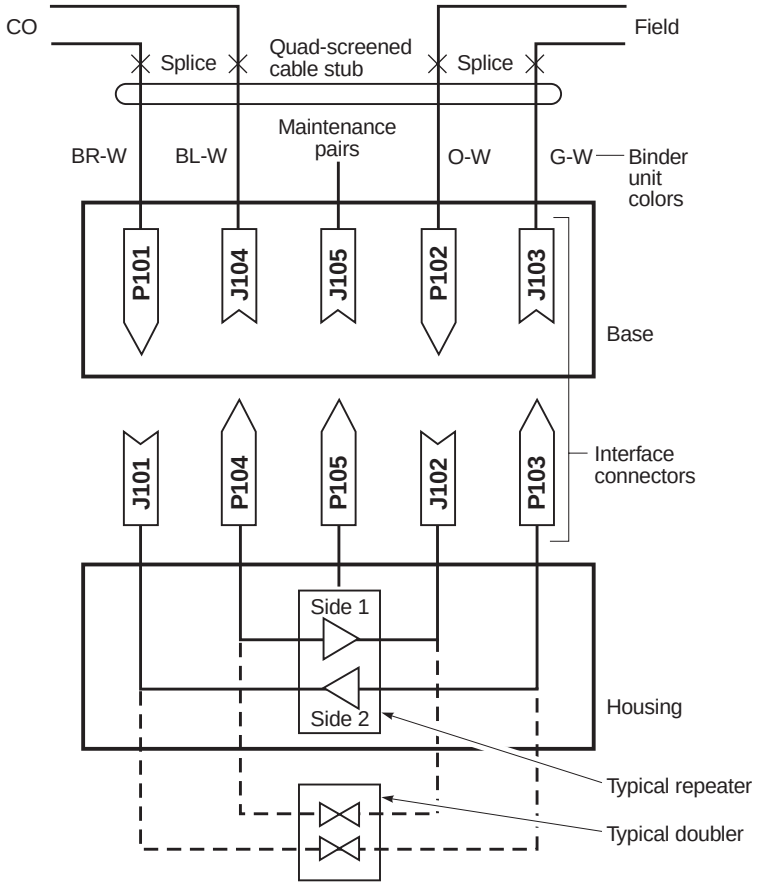


Figure 10. *Enclosure Wiring*

ORDER WIRE

The order wire is brought in on the G-W pair. The order wire access port (Figure 6 on page 9) provides access to this pair.

ADC does not supply the optional 1000A order wire terminals. These are available from third-party vendors.

THROUGH-CONNECTING

The method of through-connecting bypasses the housing and connects the pairs through the base. This allows enclosure cable pairs to bypass the housing and be extended through it for access downstream from the HRE-819. Through-connecting is accomplished by mating the 710-type connectors in the base as shown in Figure 11. The maintenance pairs that terminate in J105 are not connected through.

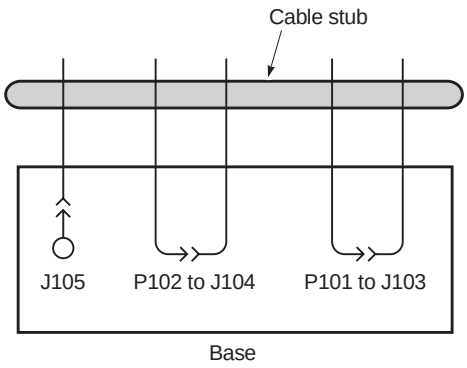


Figure 11. *Through Connections in Base*

INSTALLING DOUBLERS AND REPEATERS

To avoid injury and possible damage to the HRE-819, two people should remove it from its container: one person should handle the enclosure, the other should handle the stub.

1 For List 2 units, close the air bypass valve by turning the air bypass valve counter-clockwise $^{1}/_{4}$ turn away from the housing.

2 Depressurize the unit by removing the valve core (pin) in the air stem.

When handling the HRE-819 enclosure, always assume it is pressurized.

3 Remove the two housing lids by loosening all twelve bolts with a $^{9}/_{16}$-inch hand-held hex nut driver.

Replace the four desiccant bags (shown in Figure 4) each time the housing is entered. Place the desiccant in any empty slot or between occupied slots as space permits. Flash test the enclosure for leaks each time it is closed.

4 Install the doublers and repeaters into the available slots.

5 Make sure all sealing surfaces are clean and free of dirt and moisture.

6 Place the lids on the housing.

7 Treat the captive bolt threads with the antiseize compound.

8 Using a $^{9}/_{16}$-inch, hand-held, hex nut driver, tighten all bolts according to the sequence stamped on the cover to a torque of 25 to 50 inch-pounds. The torque flattens the lock washers. Do not attempt further tightening. The bolts shear at 125 inch-pounds.

9 Replace the valve core (pin) in the air stem on the base, then connect an air hose having a snap-on chuck to the air stem. For List 1 units, use a C pressure gauge, pressurize the case to approximately 9 psi. The pressure relief valve releases if internal pressure exceeds 12 to 25 psi and automatically resets itself when the pressure drops below the release pressure.

10 With the chuck still in place, test the enclosure for leaks with a pressure-testing solution. If the enclosure is leaking (indicated by bubbles), the housing lids are not installed correctly.

11 Remove the chuck from the air stem, then replace the valve cap.

12 For List 2 units, open the air bypass valve by turning the air bypass valve clockwise one quarter turn towards the housing.

Wiring

A single cable stub provides access from the HRE-819 to the main cable. The stub is a 54-pair, 24-gauge, S-screened cable with four, 12-pair, binder groups and a 6-pair interstatial group. The four, 12-pair groups have the same color coding. The 12-pairs of each binder group connect to the 12 double-wide slots as shown in Table 2 on page 16.

The HRE-819 is shown as wired in typical mini-repeater fashion, using Side 1 and Side 2 terminology. This adheres to conventional terminology which describes a unidirectional (simplex) service with IN and OUT directional pairs. HDSL is in fact a bidirectional (duplex) service in which each pair carries information in both directions.

The HRE-819 can house either 12 doublers or 12 T1 repeaters (239 T1) or a combination of 12 doublers and repeaters. The wiring diagram is screened on the housing lid for easy reference. Table 2 shows the slot assignments, pair assignments, numbering, color codes, and other stub details.

The six interstatial pairs (IS) are used for the PRES slot, the order wire and spare pairs as shown in Table 3 on page 17.

Table 2. *Stub Cable Termination*

Stub Cable Termination for HRE-819 Enclosure

	Side 1 (IN)				Side 1 (OUT)				Side 2 (IN)				Side 2 (OUT)			
Doubler Slot	**Binder Group**	**Pair**	**Wire**	**Pin No. in Housing**	**Binder Group**	**Pair**	**Wire**	**Pin No. in Housing**	**Binder Group**	**Pair**	**Wire**	**Pin No. in Housing**	**Binder Group**	**Pair**	**Wire**	**Pin No. in Housing**
1	BL	BL-W	BL	5	O	BL-W	BL	3	G	BL-W	BL	11	BR	BL-W	BL	8
			W	6			W	4			W	12			W	9
2	BL	O-W	O	5	O	O-W	O	3	G	O-W	O	11	BR	O-W	O	8
			W	6			W	4			W	12			W	9
3	BL	G-W	G	5	O	G-W	G	3	G	G-W	G	11	BR	G-W	G	8
			W	6			W	4			W	12			W	9
4	BL	BR-W	BR	5	O	BR-W	BR	3	G	BR-W	BR	11	BR	BR-W	BR	8
			W	6			W	4			W	12			W	9
5	BL	S-W	S	5	O	S-W	S	3	G	S-W	S	11	BR	S-W	S	8
			W	6			W	4			W	12			W	9
6	BL	BL-R	BL	5	O	BL-R	BL	3	G	BL-R	BL	11	BR	BL-R	BL	8
			R	6			R	4			R	12			R	9
7	BL	O-R	O	5	O	O-R	BR	3	G	O-R	O	11	BR	O-R	O	8
			R	6			W	4			R	12			R	9
8	BL	G-R	G	5	O	G-R	S	3	G	G-R	G	11	BR	G-R	G	8
			R	6			W	4			R	12			R	9
9	BL	BR-R	BR	5	O	BR-R	BL	3	G	BR-R	BR	11	BR	BR-R	BR	8
			R	6			R	4			R	12			R	9
10	BL	S-R	S	5	O	S-R	S	3	G	S-R	S	11	BR	S-R	S	8
			R	6			R	4			R	12			R	9
11	BL	BL-BK	BL	5	O	BL-BK	BL	3	G	BL-BK	BL	11	BR	BL-BK	BL	8
			BK	6			BK	4			BK	12			BK	9
12	BL	O-BK	O	5	O	O-BK	O	3	G	O-BK	O	11	BR	O-BK	O	8
			BK	6			BK	4			BK	12			O	9

Table 3. *Interstitial Pair Terminations*

Slot ID	Pair	Wire	Pin # in Enclosure Housing
Pressure	BL-W	BL	8
		W	9
Pressure	O-W	O	11
		W	10
Order Wire	G-W	-	-
Spare	BR-W	-	-
Spare	SL-W	-	-
Spare	BL-R	-	-

General Deployment Rules

The HRE-819 is an air-tight enclosure. This environment traps the heat generated by the installed plugs causing a significant heat rise within. The maximum number of doublers that can be reliably housed in the HRE-819 is a function of the plug types. Table 4 lists the HRE-819 deployment rules.

The 239T1 repeater may occupy any number of slots without impacting the deployment rules.

Even when you obey the deployment rules, the metal surfaces of the installed units can feel hot to the touch when removed from an HRE-819 that is operating in elevated ambient temperatures. This is a normal condition. The plugs are designed to withstand these elevated temperatures.

Table 4. *HRE-819 Deployment Rules for Doublers*

Maximum Number of Doublers		Maximum Ambient Temperature*	
With Full Solar Load	Without Full Solar Load	HDU-409 and HDU-219	HDU-439
12	12	115°F 46°C	105°F 40°C
10	12	125°F 52°C	115°F 46°C
8	10	135°F 57°C	125°F 52°C
6	8	145°F 63°C	135°F 57°C
4	6	155°F 68°C	145°F 63°C

All maximum ambient temperatures of 115°F or more comply with the outside deployment requirements of section (10.2.1.3) in TA-NWT-001210.

MAINTENANCE

This section explains maintenance procedures and lists replacement parts for the HRE-819 List 1 and 2.

PROTECTOR EXTRACTION

All protected HRE-819 enclosures are equipped with protector sockets located in each plug-in position. Use either 200A, 208A or 3P-68 protectors (gas tubes).

Remove the protectors using the 829A tool as follows:

1 For List 2 units, shut off the air supply by turning the air bypass valve counter-clockwise one-quarter turn away from the housing.

2 Release the pressure inside the case by removing the valve core (pin) from the air stem. The core is removed in the same manner as the valve core in an automobile tire tube.

3 Using a $^{9}/_{16}$-inch hand held nut drive wrench, loosen the captive bolts on the cover and remove the two covers. Remove doublers, if present.

4 Set the adaptor on the 829A tool to T1.

5 Orient the 829A tool so the locking bar faces the outboard side of the housing, then insert the 829A tool into plug-in position, and push until the resistance of the protector sliding into the protector supports is felt.

6 Remove the 829A tool from housing without depressing the locking bar.

7 To remove protectors from the 829A tool, depress locking bar and pull retractor backwards.

PROTECTOR INSTALLATION

The 829A extractor tool is available from third-party vendors.

Install the 200A (or 208A in 819A2 or 819B2) protectors within each doubler and maintenance unit plug-in slot using the 829A tool as follows:

1 For List 2 units, shut off the air supply by turning the air bypass valve counter-clockwise one-quarter turn away from the housing.

2 Release the pressure inside the case by removing the valve core (pin) from the air stem. The core is removed in the same manner as the valve core in an automobile tire tube.

3 Using a $^{9}/_{16}$-inch hand held nut drive wrench, loosen the captive bolts and remove the two covers. Remove the doublers, if present.

4 Set the adapter on the 829A tool to T1.

5 Place four protectors in the protector supports.

6 Orient the 829A tool so that the locking bar faces the outboard side of the housing, then insert the 829A tool into the plug-in position until it bottoms on the connector.

Do not attempt to force the 829A tool into the slot.

7 With the palm of your hand pressing firmly on the handle, press the locking bar and pull the retractor backward.

8 Remove the 829A tool from the housing and visually check the connector for proper placement of the protectors.

9 Secure the cover to the housing.

ADC does not supply the 829A extractor tool. It is available from third-party vendors.

REMOVING AND REPLACING BROKEN COVER BOLTS

1 Shut off the air supply by turning the air bypass valve counter-clockwise one-quarter turn away from the housing.

2 Release the pressure inside the case by removing the valve core (pin) from the air stem. The core is removed in the same manner as the valve core in an automobile tire tube.

3 Using a $^{9}/_{16}$-inch hand held nut drive wrench, loosen the captive bolts on the cover and remove the two covers. Remove the doubler, if present.

4 Secure the cover to the housing.

5 Using a pair of pliers, remove the broken bolt from the housing.

6 Obtain a proper replacement bolt, two flat washers, and one lockwasher, and replace in the housing cover.

7 Replace the cover.

REPLACEMENT PARTS

ADC provides a number of replacement part kits for the HRE-819. They are listed in Table 5 and can be ordered directly from ADC.

Table 5. *Replacement Parts*

ADC Part Number	Items	AT&T Part Number
132-1010-01	Two 131B brackets for pole mount	103827416
132-1019-01	Gaskets and desiccant (four each):	
	Base	842301137
	Housing	842301509
	OW	842302648
	Terminal and Order wire O ring	900458746
	C desiccant bags	996487526
132-1020-01	Two shallow, 2” lids	842301483
132-1021-01	Two deep, 3.5” lids	842301491
132-1022-01	Valves (three each):	
	An air bypass valve (List 2 only)	842303265
	Air stem / pressure relief valve (Lists 1 and 2)	402635155
132-1023-01	Fifty 200A protector tubes	103049441
132-1024-01	Nuts and bolts (15 each):	
	Lid bolts	842301558
	Lid washers, Type B	900518309
	Lid lockwashers	402521678
	Lid washers, plain	900496183
	Housing bolts	900471707
132-1025-01	Installation hardware kit	N/A
132-1026-01	131B pole-mounting assembly	N/A

ADC does not supply the optional pressure contactor alarm card. It is available from third-party vendors.

APPENDIX A - SPECIFICATIONS

ENVIRONMENT

Operating Temperature	-40° to +150° F (-40° to +65° C)
Operating Humidity	5 to 95% (non-condensing)
Altitude	to 14,000 ft. (4,300 m)

DIMENSIONS

Height	23 inches (58.4 cm)
Width	16 inches (40.6 cm)
Depth	15-7/8 inches (40.3 cm) Shallow lid 17-3/8 inches (44.1 cm) Deep lid
Weight	65 lbs. (29.5 kg)

APPENDIX B - ABBREVIATIONS

Abbreviations used throughout this manual are defined below:

ALP FSS-PIC	Aluminum Polyethylene Filled S-Screened PIC
Amp	Ampere
ANSI	American National Standards Institute
AWG	American Wire Gauge
CLEI	Common Language Equipment Identifier
CO	Central Office
CP	Customer Premises
DEPIC	Dual Encapsulated Plastic Insulated Cable
ECI	Equipment Catalog Item
EDU	HiGain Doubler Unit
EMI	ElectroMagnetic Interference
ETSI	European Telecommunications Standards Institute
HCDS	High Capacity Digital Service
HCS	HiGain Card Shelf
HDSL	High-bit-rate Digital Subscriber Line
HDU	HiGain Doubler Unit
HRE	HiGain Remote Enclosure
HRU	HiGain Remote Unit
HTC	HiGain Test Card
ICEA	Insulated Cable Engineers Association
PIC	Plastic Insulated Cable
PSI	Pounds Per Square Inch

APPENDIX C - PRODUCT SUPPORT

TADC Customer Service Group provides expert pre-sales and post-sales support and training for all its products.

Technical support is available 24 hours a day, 7 days a week by contacting the ADC Technical Assistance Center (TAC).

Sales Assistance 800.366.3891 extension 73000 (USA and Canada) 952.917.3000 Fax: 952.917.3237	• Quotation Proposals • Ordering and Delivery • General Product Information
Systems Integration 800.366.3891, extension 73000 (USA and Canada) 952.917.3000	• Complete Solutions (from concept to installation) • Network Design and Integration Testing • System Turn-Up and Testing • Network Monitoring (upstream or downstream) • Power Monitoring and Remote Surveillance • Service/Maintenance Agreements • Systems Operation
ADC Technical Assistance Center 800.638.0031 714.730.3222 Fax: 714.730.2400 Email: wsd_support@adc.com	• Technical Information • System/Network Configuration • Product Specification and Application • Training (product-specific) • Installation and Operation Assistance • Troubleshooting and Repair/Field Assistance
Online Technical Support	• www.adc.com/Knowledge_Base/index.jsp
Online Technical Publications	• www.adc.com/library1/
Product Return Department 800.366.3891 ext. 73748 or 952.917.3748 Fax: 952.917.3237 Email: repair&return@adc.com	• ADC Return Material Authorization (RMA) number and instructions must be obtained before returning products.

All telephone numbers with an 800 prefix are toll-free in the USA and Canada.

BAR CODE LABEL AND CONFIGURATION NUMBER

Figure 12 shows the location of the CLEI/ECI bar code label and the configuration number on the HRE-819. Table 6 provides a brief description of what each label contains.

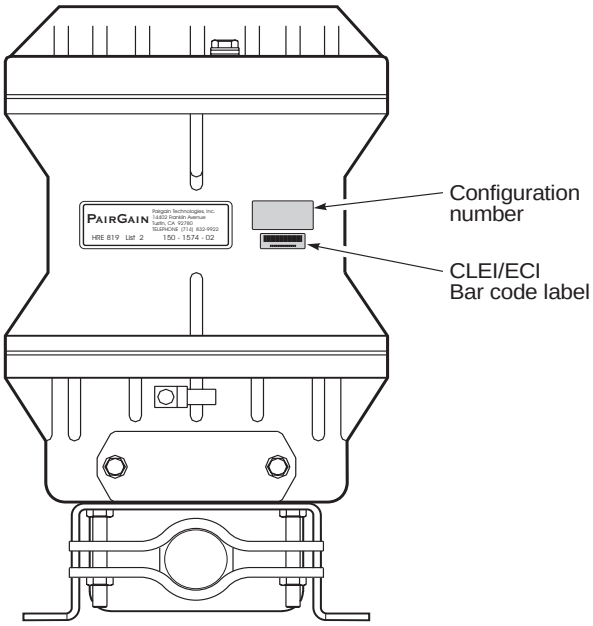


Figure 12. *Location of Bar Code and Configuration Number Labels*

Table 6. *Bar Code and Configuration Number Labels*

Name	Description
CLEI/ECI Bar Code Label	Contains human-readable Common Language Equipment Identified (CLEI) code number and Equipment Catalog Item (ECI) bar code number.
Configuration Number	This label contains the configuration or revision number, the part number, the Julian date, and the barcoded serial number.

CERTIFICATION AND WARRANTY

FCC COMPLIANCE

This equipment does not have a clocking source, and is a passive device according to FCC guidelines. When used in conjunction with a clocking device, this combined system may radiate radio frequency energy that can cause harmful interference to radio communications. Operation of such a system in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Refer to the installation section of the appropriate instruction manual for the unit you are installing to get information on:

- Cabling
- Correct connections
- Grounding

LIMITED WARRANTY

ADC DSL Systems, Incorporated (“ADC”) warrants that, for a period of sixty (60) months from the date of shipment, the hardware portion of its products will be free of material defects and faulty workmanship under normal use. ADC's obligation, under this warranty, is limited to replacing or repairing, at ADC's option, any such hardware product which is returned during the 60-month warranty period per ADC's instructions and which product is confirmed by ADC not to comply with the foregoing warranty.

ADC warrants that, for a period of 90 days from the date of purchase, the software furnished with its products will operate substantially in accordance with the ADC published specifications and documentation for such software. ADC’s entire liability for software that does not comply with the foregoing warranty and is reported to ADC during the 90-day warranty period is, at ADC’s option, either (a) return of the price paid or (b) repair or replace of the software. ADC also warrants that, for a period of thirty (30) days from the date of purchase, the media on which software is stored will be free from material defects under normal use. ADC will replace defective media at no charge if it is returned to ADC during the 30-day warranty period along with proof of the date of shipment.

The transportation charges for shipment of returned products to ADC will be prepaid by the Buyer. ADC will pay transportation charges for shipment of replacement products to Buyer, unless no trouble is found (NTF), in which case the Buyer will pay transportation charges.

ADC may use reconditioned parts for such repair or replacement. This warranty ***does not*** apply to any product which has been repaired, worked upon, or altered by persons not authorized by ADC or in ADC's sole judgment has been subjected to misuse, accident, fire or other casualty, or operation beyond its design range.

Repaired products have a 90-day warranty, or until the end of the original warranty period—whichever period is greater.

ADC DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ITS PRODUCTS AND ANY ACCOMPANYING WRITTEN MATERIALS. FURTHER, ADC DOES NOT WARRANT THAT SOFTWARE WILL BE FREE FROM BUGS OR THAT ITS USE WILL BE UNINTERRUPTED OR REGARDING THE USE, OR THE RESULTS OF THE USE, OF THE SOFTWARE IN TERMS OF CORRECTNESS, ACCURACY, RELIABILITY OR OTHERWISE.

MODIFICATIONS

Any changes or modifications made to this device that are not expressly approved by ADC DSL Systems, Inc. voids the user's warranty.

All wiring external to the products should follow the provisions of the current edition of the National Electrical Code.

STANDARDS COMPLIANCE

The equipment has been tested and verified to comply with the applicable sections of the following standards:

- TR-NWT-000056-Repeater Housings for T1, T1C, T1D, and T1G Carrier Systems
- TR-TSY-000052-Below Ground Enclosures

For technical assistance, refer to Apendix C - Product Support on page 23.

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