

HRE-450 List 4A Remote Enclosure
Product Catalog: 150-1121-41

Revision History of This Manual

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Issue	Release Date	Revisions Made
1	August 18, 1998	Initial release
2	February 1, 2002	Rebranding

Copyright

August 18, 1998

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USING THIS MANUAL

The following conventions are used in this manual:

- Monospace type indicates screen text.
- Keys you press are indicated by small icons such as **Y** or **ENTER**. Key combinations to be pressed simultaneously are indicated with a plus sign as follows: **CTRL** + **ESC**.
- Items you select are in **bold**.
- Three types of messages, identified by icons, appear in text.



Notes contain information about special circumstances.



Cautions indicate the possibility of personal injury or equipment damage.

INSPECTING SHIPMENT

Upon receipt of the equipment:

- Unpack each container and inspect the contents 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 DSL Systems, Inc. Order replacement equipment, if necessary.
- Check the packing list to ensure complete and accurate shipment of each listed item. If the shipment is short or irregular, contact ADC DSL Systems, Inc. as described in [“Appendix B - Product Support”](#) on page 14. If you must store the equipment for a prolonged period, store the equipment in its original container.

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PRODUCT OVERVIEW

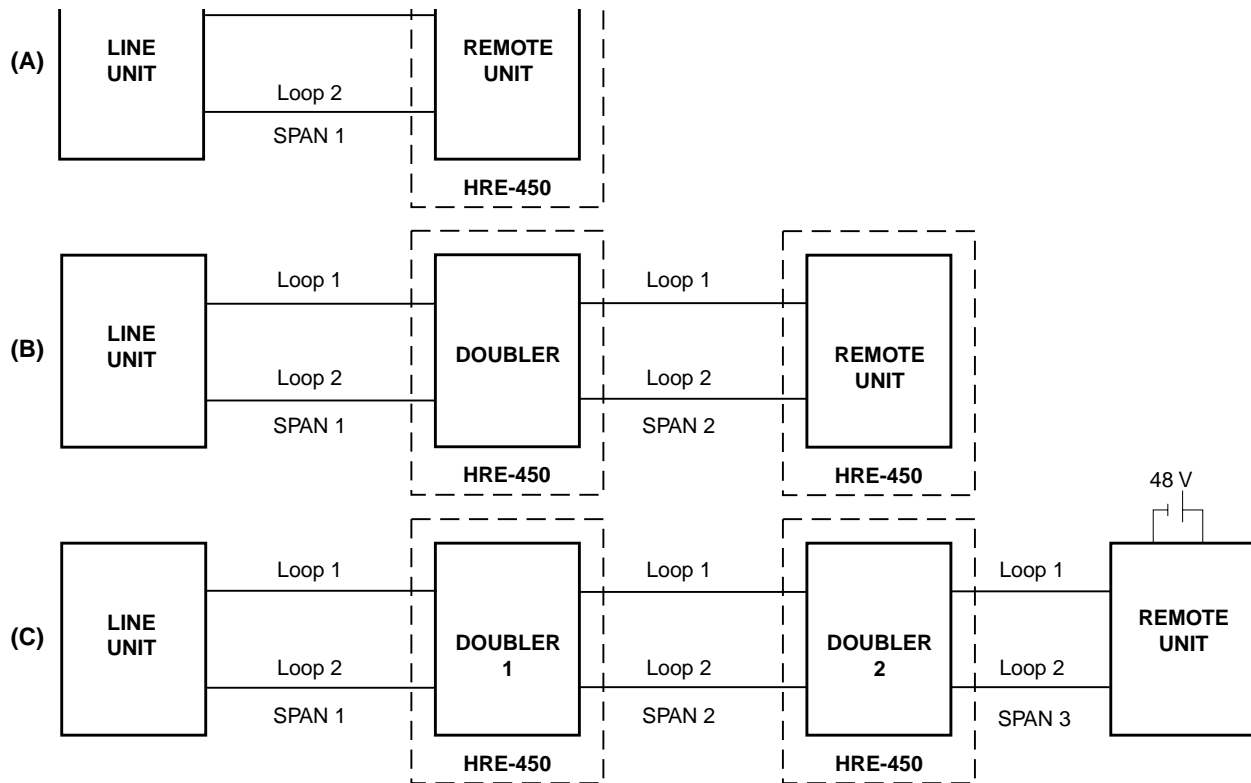
This technical practice describes the HiGain® Remote Enclosure Model HRE-450 List 4A. The HRE-450 is one component of a HiGain (T1 transmission) system, which transmits data at up to 1.544 Mbps onto two unconditioned copper pairs over the full Carrier Service Area (CSA) range. A HiGain system consists of a line unit and a remote unit (usually housed in a remote enclosure), and may include up to four doublers to extend the transmission distance.

This HRE-450 List 4A is a weatherproof enclosure that houses either one single-slot HiGain Remote Unit (HRU) or one HiGain Doubler Unit (HDU). The HRE-450 List 4A mounts outdoors on any suitable above-ground surface, such as a concrete wall or wooden telephone pole. Because it cannot be pressurized, the HRE-450 List 4A cannot be installed in an underground location. To reduce emissions, the HRE-450 List 4A features a metallized gasket around the edges.



The HRE-450 List 4A can also be used to support E1 circuits, by housing either an E1 Doubler Unit (EDU) or E1 Remote Unit (ERU).

[Figure 1 on page 2](#) shows three different HRE-450 configurations for either T1 High-bit-rate-Digital Subscriber Line (HDSL) circuits or G.703 E1 circuits. The line unit is installed in a Central Office (CO) shelf and the HRU or HDU is housed in an HRE-450. Optional HDUs provide the ability to double or triple the distance range for customer applications located outside the CSA.



- (A) System with no doublers
- (B) System with one doubler
- (C) System with two doublers

Figure 1. HRE-450 List 4A Configurations



The HRE-450 List 4A is not designed to house locally-powered remote units. Therefore, in a two-doubler system (C above), the remote unit cannot be installed in an HRE-450 List 4A.

HRE-450 LIST 4A FEATURES

- Easily mounted on a wall or pole using supplied screws.
- Front cover opens easily, which enables quick inspection or service of enclosed unit.
- Uses weather-sealing cable fittings that protect connections and provide cable strain relief .
- Protects remote or line unit against adverse weather conditions and harmful contaminants.
- Uses Quiet-Front Connector Modules (QFCMs) to provide electrical surge protection and corrosion-resistant wire.
- Complies with European CE Standards.

HRE-450 LIST 4A COMPONENTS

Figure 2 and Table 1 on page 4 identify the HRE-450 List 4A components.

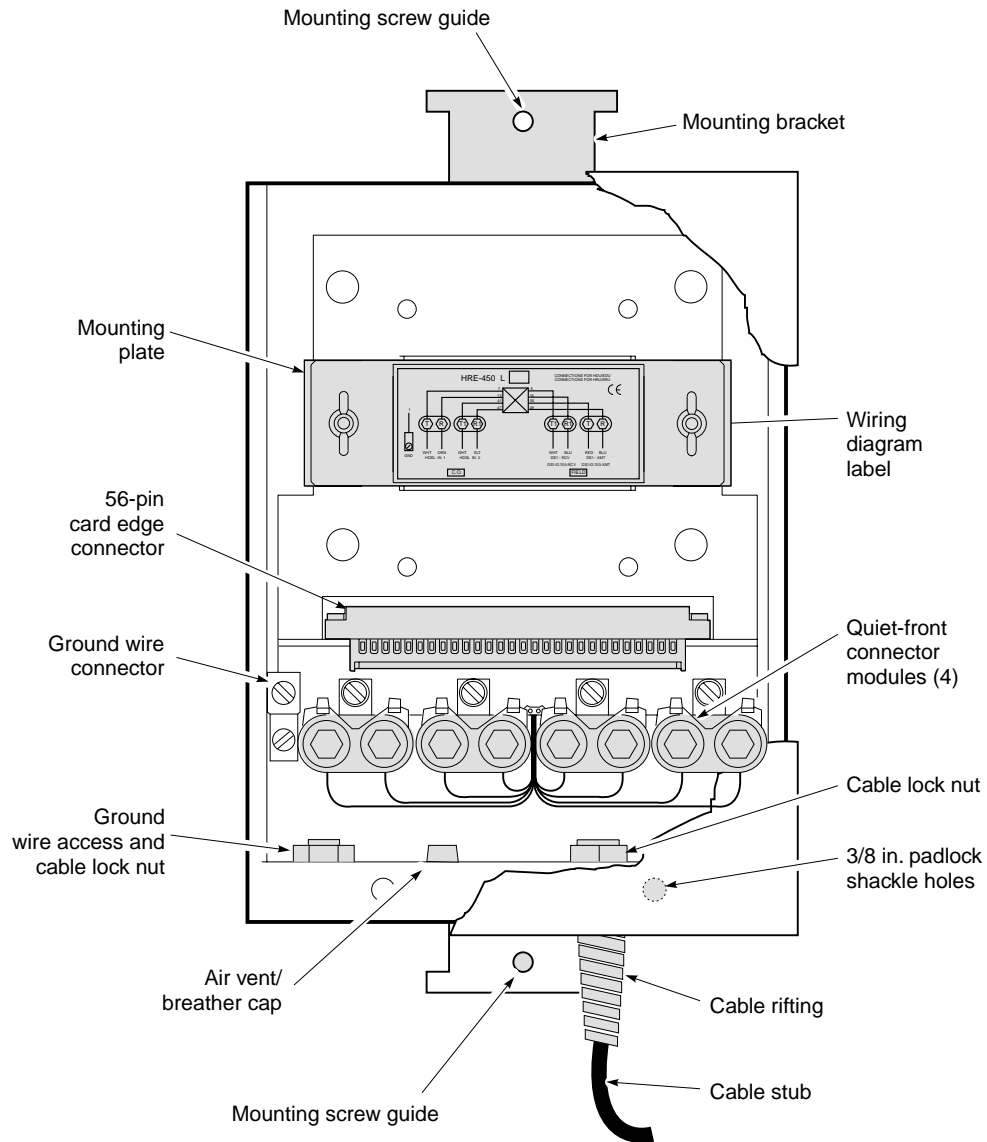


Figure 2. HRE-450 List 4A Components

COMPATIBILITY

The HRE-450 List 4A is compatible with the following PairGain products:

- HRU-412 HiGain Remote Units, list 6 or higher
- EDU-451 E1 HiGain Doubler Units
- HDU-451 T1 HiGain Doubler Units

Table 1. HRE-450 List 4A Components

Component	Function
Mounting bracket	Secures the HRE-450 List 4A to the installation location.
Mounting screw guides	Indicate where to drill the mounting screw holes.
Mounting plate	Secures the remote unit or doubler in the enclosure.
Wiring diagram label	Provides installation wiring diagram for both DS1(T1) and G.703 circuits.
56-pin card edge connector	Provides card edge connectivity for the installed remote or doubler unit.
Quiet-Front Connector Modules	Provides Tip and Ring wiring entry holes for HDSL connectors J1 through J4.
Ground wire connector	Used to attach the grounding wire.
Ground wire access	Provides access for insertion of ground wire lug.
Air vent/breather cap	Permits air circulation and keeps internal atmosphere free of harmful contaminants.
3/8 in. padlock shackle holes	Used to attach a padlock for security.
Cable stub	Provides access for transmit and receive HDSL connector wires.
Cable lock nut	Secures the cable rifting and stub to the enclosure.
Cable rifting	Provides strain relief for the stub.

INSTALLATION

This section describes how to prepare to install the HRE-450 List 4A, and how to install and wire the unit.

INSPECTING YOUR SHIPMENT

When you receive the equipment, 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.

In addition to this technical practice, your shipment should consist of:

- One HRE-450 List 4A enclosure
- Installation Kit containing:
 - three wood screws (#10 x 1.5 in.) (two for installation, one spare)
 - three anchor nuts (#10 x 1 in.) (two for installation, one spare)
 - three flat washers (#10 CPS/ZPS) (two for installation, one spare)
 - one cable tie (5.5 in. length, 0.15 in. width)

If any of the above items are missing, or the shipment is damaged, please contact your ADC sales representative.

LOCATING THE NECESSARY TOOLS

To install the HRE-450 List 4A, you need the following tools:

- No. 2 screwdriver
- Drill
- Wood or metal or concrete drill bits (depending on installation surface)
- Hammer
- Two Type 216C ($\frac{7}{16}$ in.) wrenches
- $\frac{3}{16}$ in. can wrench

INSTALLING THE HRE-450 LIST 4A

Install the HRE-450 List 4A onto a concrete or wood surface, such as a wall or telephone pole, using the hardware provided in the Installation Kit. The HRE-450 must be installed above ground, in a location that provides access to wiring and grounding connections. To install the unit:

- 1 Using a $\frac{3}{16}$ in. hex wrench, or an adjustable wrench, loosen the screw on the HRE-450 List 4A cover, then remove the cover.

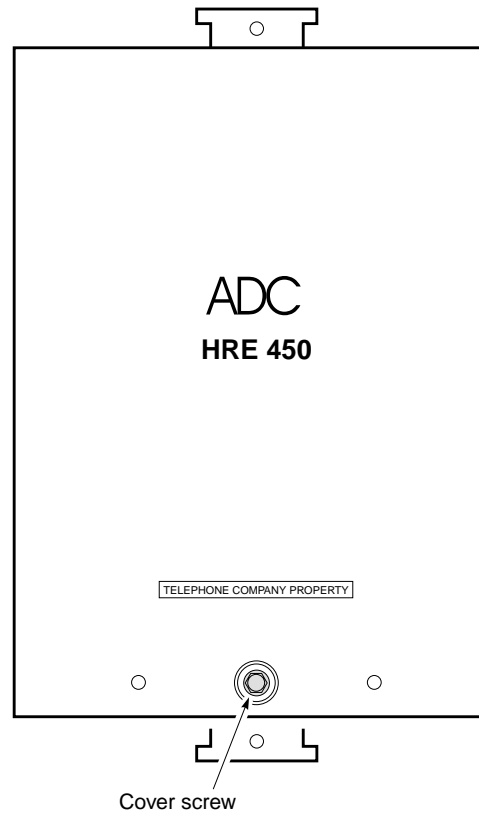


Figure 3. Locating the HRE-450 List 4A Cover Screw

- 2 Make sure that each of the two compression connector nuts is secure. If a nut is not secure, tighten it using your fingers.

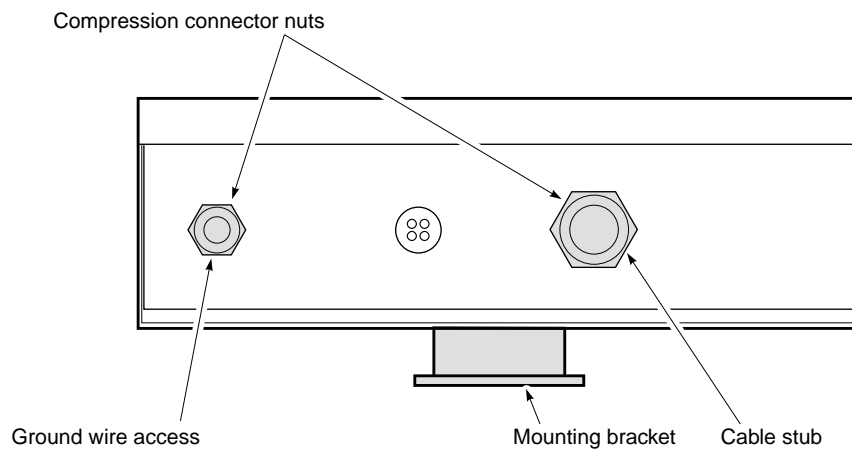


Figure 4. Bottom of the HRE-450 List 4A

- 3 Place the HRE-450 List 4A in the selected installation location, then mark the mounting screw hole locations on the installation surface, using the mounting screw guides (see [Figure 5](#)).

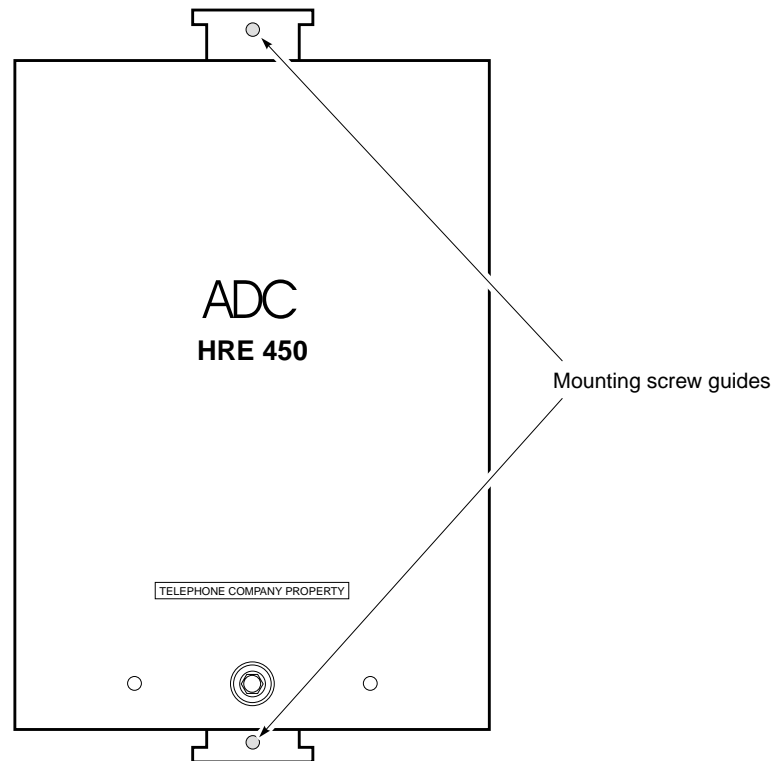


Figure 5. Locating the Mounting Screw Guides

- 4** Do one of the following:
 - If the installation location is wood, use a drill with a wood or metal drill bit to drill the mounting screw holes into the wooden surface.
 - If the installation location is concrete, use a drill with a concrete drill bit that is slightly smaller than the diameter of the anchor nuts to drill the mounting screw holes into the concrete surface.
- 5** Insert the two anchor nuts into the mounting screw holes and tap the nuts into place with a hammer.
- 6** While holding the HRE-450 List 4A in place, place a washer over one of the mounting screw holes and, using a #2 screwdriver, screw one of the provided wood screws into the mounting hole.
- 7** While holding the HRE-450 List 4A in place, place a washer over the other mounting screw hole and, using a #2 screwdriver, screw another of the provided screws into the mounting screw hole.

WIRING THE HRE-450 LIST 4A

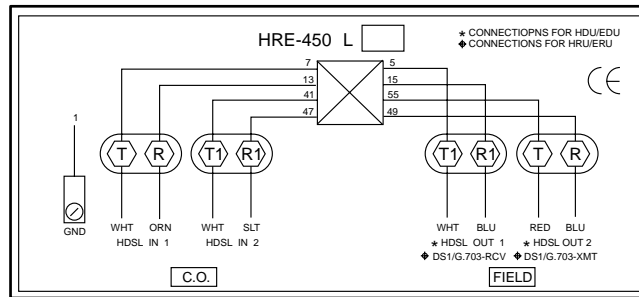


Figure 6. Figure 6. HRE-450 List 4A Wiring Diagram

Connect the HRE-450 List 4A to the Signal Cables and Ground Wire as follows (see [Figure 6](#) for a wiring overview):

- 1 Loosen the compression connector nuts on the bottom of the HRE-450 List 4A using one of the following methods:
 - Use your hand to turn the compression connector nuts counterclockwise (see [Figure 4](#) on page 8 for compression connector nut location).
 - If the compression connector nuts are too tight to loosen by hand, use groove-joint pliers to hold the cable fitting center locknut, then use another pair of groove-joint pliers to turn each compression nut counterclockwise.
- 2 Feed solid ground wire, up to #6 AWG, through the HRE-450 List 4A ground wire access (see [Figure 2](#) on page 3 for the ground wire access location).
- 3 Strip approximately $1/2$ in. of insulation from the end of the ground wire.
- 4 Insert the stripped wire into the ground wire access, then tighten the ground wire connector.
- 5 Use your fingers to tighten the ground wire connector (see [Figure 2](#) on page 3 for the ground wire connector location).



The HRE-450 List 4A features exposed metal around the mounting hole guides, providing an alternative chassis ground connection.

- 6 Loosen the cable lock nut (see [Figure 2](#) on page 3 for cable lock nut location).
- 7 Insert approximately 6 in. of interface telephone cable through the exposed cable stub fitting hub.
- 8 Slit the ends of the leads of each drop-wire pair and bend as shown in [Figure 7](#)

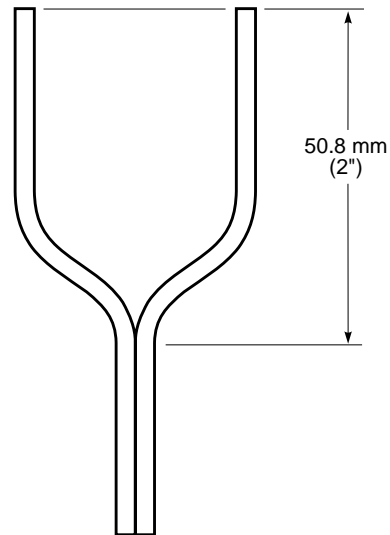


Figure 7. Preparing the Wire Pair for Insertion into the Quiet-Front Connector Modules



Do not strip the drop-wire pair insulation.

- 9 Use a Type 216C ($\frac{7}{16}$ in.) wrench to rotate each QFCM lug $\frac{1}{4}$ turn counterclockwise to open the connectors.



Do not rotate the QFCM lug more than $\frac{1}{4}$ turn, or it may fall off the QFCM.

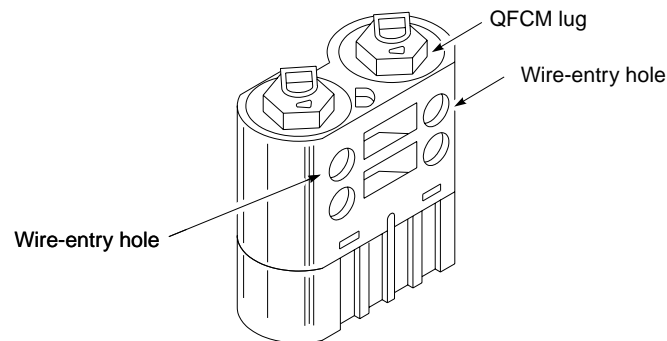


Figure 8. Locating the QFCM Lug

- 10 Insert the first pair's Tip wire into the left Wire-Entry hole on the left QFCM, until the wire touches the ends of the transparent plastic caps.
- 11 Insert the first pair's Ring wire into the right Wire-Entry hole on the left QFCM, until the wires touch the ends of the transparent plastic caps. (See [Figure 6](#) on [page 9](#) for a complete wiring diagram).
- 12 While holding the Tip and Ring wires in place with your fingers, use a Type 216C ($\frac{7}{16}$ in.) wrench to rotate each QFCM lug $\frac{1}{4}$ turn clockwise.



Do not rotate the QFCM lug more than $\frac{1}{4}$ turn.

- 13** Using your fingers (do not use a pliers or wrench), tighten the cable lock nut. If necessary, use groove-joint pliers to hold each cable rifting center locknut while tightening each compression nut with your fingers.
- 14** Repeat [Step 10](#) through [Step 13](#) using the second wire pair and the right QFCM.
- 15** Use cable ties to dress the wires that enter the enclosure box and connect to the QFCM terminals, per local practice.
- 16** Position and secure the ground wire along the installation surface and connect it to a nearby ground, per local practice.

INSTALLING A DOUBLER OR REMOTE UNIT

To install a doubler or remote unit in the HRE-450 List 4A:

- 1 Loosen the wingnuts on the strap, then pull the strap away from the mounting plate.
- 2 Slide the doubler or remote unit into the slot until firmly seated.

If Vdc is present, the doubler or remote unit begins an initial power-on cycle within 30 seconds.

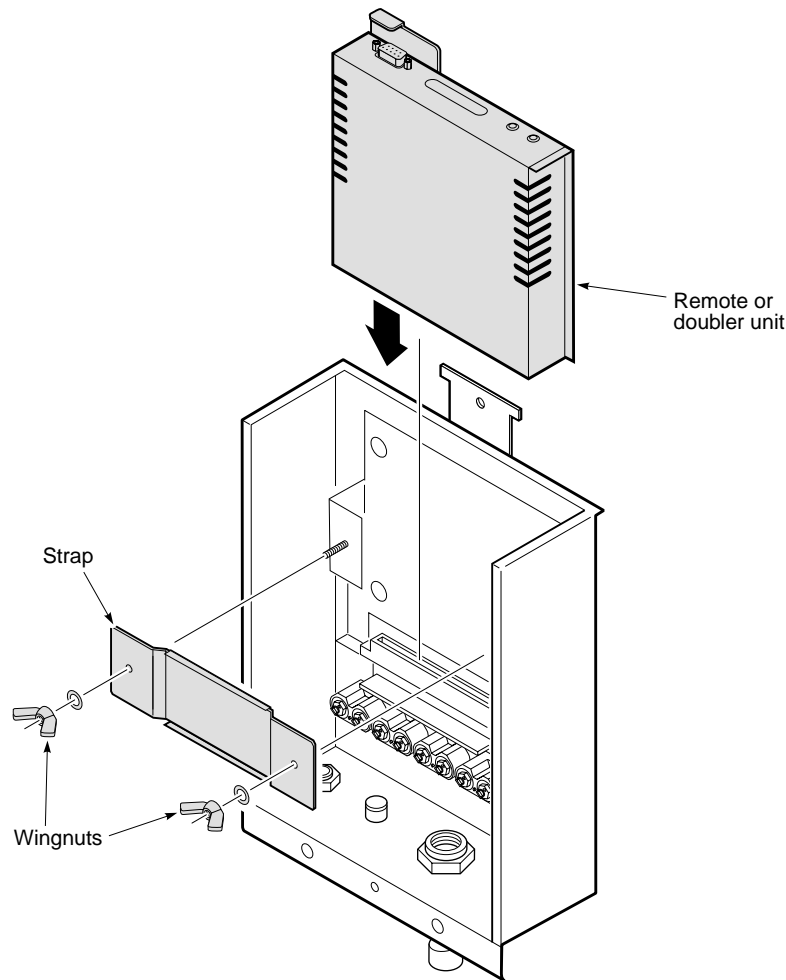


Figure 9. Installing a Remote or Doubler Unit in an HRE-450 List 4A

- 3 Verify the following:
 - If the installed unit is a doubler, and the remote unit is not yet installed in the system, the doubler completes its initial power-on cycle and two HDSL IN LEDs light green.
 - If the installed unit is a doubler, and the remote unit is installed in the system, the doubler completes its initial power-on cycle and the two HDSL IN and two HDSL OUT LEDs light green.
 - If the installed unit is a remote unit, the unit completes its initial power-on cycle and both front-panel HDSL LEDs light green.

- 4** Replace the strap, then tighten the wingnuts.
- 5** Install the HRE-450 List 4A cover and tighten the screw to approximately 6 to 8 in-lbs. (maximum) torque to secure.

APPENDIX A - SPECIFICATIONS

This section describes the HRE-450 List 4A technical specifications.

Physical

Material	Steel
Finish	Zinc plated
Mounting	concrete wall or wooden telephone pole

Enclosure Box

Height	9.31 in. (23.65 cm)
Width	7.31 in. (18.57 cm)
Depth	2.31 in. (5.87 cm)

Enclosure Lid

Height	10.25 in. (26 cm)
Width	7.5 in. (19.1 cm)
Depth	2.69 in. (6.83 cm)

Quiet Front Connector Modules (QFCM)

Electrical Protection	Each QFCM module contains a 60 A, three-element, gas-tube surge protector with a 265-600 Vdc breakdown voltage at breakdown rate of 2000 V/second
Specification compliance	PB 80 Heavy Duty, Bellcore TP-TS-1-000073, GTS 8376, UL 497

Environmental

Operating Temperature	- 40 C to +65 C (40°F to 149° F)
Operating Humidity	5 to 95% non-condensing

APPENDIX B - PRODUCT SUPPORT

ADC 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 ext. 73000 (USA and Canada) or 952.917.3000 Fax: 952.917.3237	<ul style="list-style-type: none"> • Quotation Proposals • Ordering and Delivery • General Product Information
Systems Integration 800.366.3891, ext. 73000 (USA and Canada) or 952.917.3000	<ul style="list-style-type: none"> • 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 (USA and Canada) or 714.730.3222 Fax: 714.730.2400 Email: wsd_support@adc.com	<ul style="list-style-type: none"> • Technical Information • System/Network Configuration • Product Specification and Application • Training (product-specific) • Installation and Operation Assistance • Troubleshooting and Repair/Field Assistance
Online Technical Support	<ul style="list-style-type: none"> • www.adc.com/Knowledge_Base/index.jsp
Online Technical Publications	<ul style="list-style-type: none"> • www.adc.com/library1/
Product Return Department 800.366.3891 ext. 73748 (USA and Canada) or 952.917.3748 Fax: 952.917.3237 Email: repair&return@adc.com	<ul style="list-style-type: none"> • ADC Return Material Authorization (RMA) number and instructions must be obtained before returning products.
<i>All 800 lines are toll-free in the USA and Canada.</i>	

CERTIFICATION AND WARRANTY

FCC CLASS A COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment 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

EUROPEAN CE STANDARDS COMPLIANCE

The HRE-450 List 4A complies with:

- Electromagnetic Interference (EMI) compliance: EN 55022, Class B and IEC-950
- Electrostatic Discharge (ESD) and Fast Transients Compliance: ENC 5082-1 and IEC-801-2 and 801-4
- Safety: EN 60950 and IEC 950

LIMITED WARRANTY

ADC DSL Systems Inc. (“ADC”) warrants that, for a period of sixty months (60) 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 sixty-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.

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RETURNS

ADC continues to repair faulty modules beyond the warranty program at a nominal charge. Contact your ADC sales representative for details and pricing.

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.

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