

AdrenaLine™ OSP xDSL Single-Line Conditioner Unit

– Installation Guide –

- IMPORTANT NOTE -

For the most current, up-to-date, AdrenaLine documentation, always go to www.charlesindustries.com/main/adrenaline.html, or call the Charles Technical Support Group for assistance at 1-800-607-8500.

1. GENERAL

1.1 Document Purpose

This document provides general and installation information necessary to install the Charles Industries' AdrenaLine™ CRE-01 and CTA-01 series of OSP xDSL Line Conditioners. Figure 1a shows a typical single-line CTA-01L, CTA-01E or CRE-01E model, and Figure 1b shows a typical single-line CRE-01L-S model. Consult the Engineering Guidelines document for more detailed engineering or placement guidelines. See Table 1 for a list of models in the series or call Charles Industries (see Part 4) to request more information or literature.

- NOTE -

Hereafter all Charles AdrenaLine models may be referred to as the "AdrenaLine." Specific models are used where differences apply.

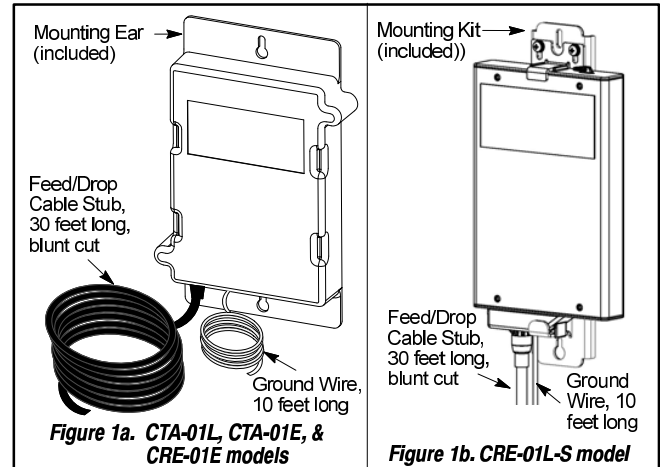


Figure 1. AdrenaLine xDSL Line Conditioner

1.2 Product Purpose and Description

The AdrenaLine xDSL Line Conditioner is an analog device that improves available ADSL/ADSL2/ADSL2+ bandwidth through noise filtering and signal amplification. The line conditioner system employs Phylogly®, Inc.'s Triple-Stream® technology and is packaged in a hardened OSP enclosure system. The AdrenaLine xDSL Line Conditioner is placed at an approximate mid-point between the DSLAM equipment and customer premises equipment, as determined by signal attenuation. AdrenaLine tunes its internal circuitry to compensate for distance, wire gauge, and other plant variables, and conditions the DSL line in both directions to maximize rate and reach. Minimal power is required, and AdrenaLine is line powered with express powering available for certain applications (see Paragraphs 2.1 and 2.2).

1.3 Product Mounting

AdrenaLine is mounted in buried (handholes, pedestals), in underground (manholes), or in aerial applications (on poles). AdrenaLine units are self-contained, single-line, stubbed units. *Only* the CRE-01L-S has a mounting bracket kit which is included as shown in Figure 1b.

2. OUTSIDE PLANT (OSP) CONSIDERATIONS

Table 1 provides limits for AdrenaLine by part numbers for line-powered and express-powered units. See the Engineering Guidelines practice for more information.

2.1 Line Powering

The line powered version operates with a single pair from the CO, carrying both the power (-48 VDC with a minimum of 35 mA) and the transmission signal.

2.2 Express Powering (if required by the application)

When the application requires express power, another pair is required for power. This pair will originate from a separate power source (-48 VDC with a minimum of 10 mA) either at the CO or RT. One power pair can power up to five AdrenaLine units depending on distance, wire gauge, etc. Reference the application note, *Powering Multiple Express Power AdrenaLine Units* for additional information.

3. INSTALLATION

See Table 2 for steps to install the CRE-01 and CTA-01 series of AdrenaLine™ OSP xDSL line conditioners.

Table 1. Single-Line AdrenaLine Unit Application Limits

Model		26 AWG Cable*	24 AWG Cable*	22 AWG Cable*
		Min. - Max.	Min. - Max.	Min. - Max.
CTA-01L - Line Power, Shorter Loops	Loop Length	6 - 12.6 Kft	7.6 - 18 Kft	9.6 - 32.4 Kft
		500 - 1050 Ω	395 - 934 Ω	310 - 583 Ω
	Placement	3 - 6 Kft	3.8 - 9.6 Kft	4.8 - 15.4 Kft
CRE-01L-S - Line Power, Longer Loops	Loop Length	11 - 15.6 Kft	13.9 - 25 Kft	17.6 - 36 Kft
		917 - 1300 Ω	723 - 1300 Ω	570 - 1166 Ω
	Placement	5 - 8 Kft	6.7 - 12.8 Kft	8.6 - 20.2 Kft
CTA-01E - Express Power, Shorter Loops	Loop Length	6 - 16 Kft	7.6 - 22 Kft	9.6 - 29 Kft
		500 - 1333 Ω	395 - 1142 Ω	310 - 940 Ω
	Placement	3 - 8 Kft	3.8 - 11 Kft	4.8 - 14 Kft
CRE-01E - Express Power, Longer Loops	Loop Length	16 - 21.3 Kft	22 - 28 Kft	29 - 36 Kft
		1333 - 1775 Ω	1142-1455 Ω	940 - 1166 Ω
	Placement**	6.6 - 10.7 Kft	8.8 - 14 Kft	12 - 18 Kft
		550 - 890 Ω	455 - 725 Ω	390 - 585 Ω

* Assuming buried cable at 20°C. ** Minimum CRE-01E to CPE ohm value is 500 Ω for 26 AWG, 450 Ω for 24 AWG, and 400 Ω for 22 AWG.

Note: The nominal operating voltage is -48 VDC. The minimum AdrenaLine input voltage is -22 VDC (off-hook); maximum is -56 VDC.

Note: Power consumption is approximately 250 mW.

- WARNINGS & CAUTIONS -

Do not damage any buried cables or service wires while digging to prepare a hole/trench, to expose cables or while driving stakes.

Always follow all local codes, safety practices, and company practices whenever grounding or installing equipment.

Perform all bonding and grounding prior to any electrical and communications connections.

- INSPECTION NOTE -

Visually inspect the unit for damage prior to installation. If the equipment was damaged in transit, immediately report the extent of the damage per local company practices and procedures.

Table 2. Installing the AdrenaLine™ Single-Line Unit

Step	Action
1. □	Determine loop-placement location. For single-gauge loops, ideal AdrenaLine placement is half-way between the DSLAM and CPE (see Table 1 for limitations). For multi-gauge loops, ideal placement is determined by using the <i>AdrenaLine Placement Calculator</i> found at the website address below. Place the AdrenaLine unit as close as possible to the ideal placement location within the total CO/DSLAM-to-CPE loop. http://www.charlesindustries.com/main/adrenalinetool.html
2. □	Determine mounting type. AdrenaLine units are mounted in underground, buried, or aerial applications. Consult local company practices to determine the mounting or installation type and the required equipment.
3. □	Route AdrenaLine cable tail. Route the cable tail of the AdrenaLine unit toward the splice case, pedestal, or housing. Follow company practice for cable support, slack, and storage concerns or trenching requirements.
4. □	Mount the AdrenaLine unit. Gather all materials, follow all safety precautions and local codes, prepare the installation site, and mount the unit. See Figure 2 and Figure 3.
5. □	Determine, measure, and mark cable tail sheath opening point. Sheath preparation and the length of exposed cable wire for splicing will depend on the type of splice housing used when splicing the AdrenaLine cable tail. Adequate AdrenaLine cable stub wire should be made available according to the existing splice arrangement. Mark the cable sheath opening point on the AdrenaLine cable tail stub after determining or establishing an adequate length of cable wire to match the existing splice.
6. □	Score, cut, and open cable sheath. Always follow safety precautions when working with cables and cable opening and cutting tools. Perform the cable sheath opening procedure, per local practices.
7. □	Bond cable tail. Perform cable bonding with a cable bond clamp at the cable tail sheath opening, then bond the cable at the clamp to an approved ground with a bond strap or wire, all per local company practice.
8. □	Ground AdrenaLine's green ground wire. Connect the external, green, ground wire on the AdrenaLine unit to an approved earth ground, per local company practice.
9. □	Perform splicing. Open the splice case and perform splicing per company practice. Refer to Table 4 and Table 3 as needed.
10. □	Test. Test or verify the connections for proper operation and make any needed corrections, changes or adjustments, per local company practice. Verify -48 VDC is on the blue wire of the AdrenaLine unit.

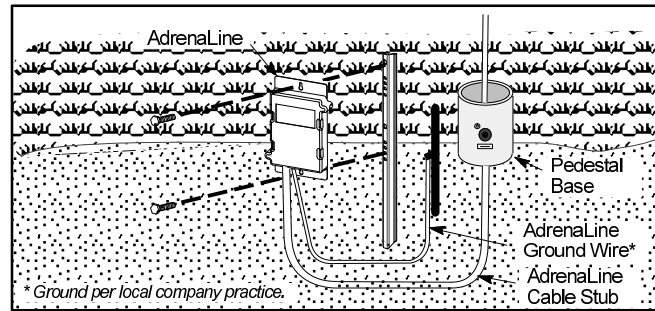


Figure 2. Above-Grade Installation of CTA-01E, CTA-01L or CRE-01E with Buried Cable and Above-Grade Pedestal

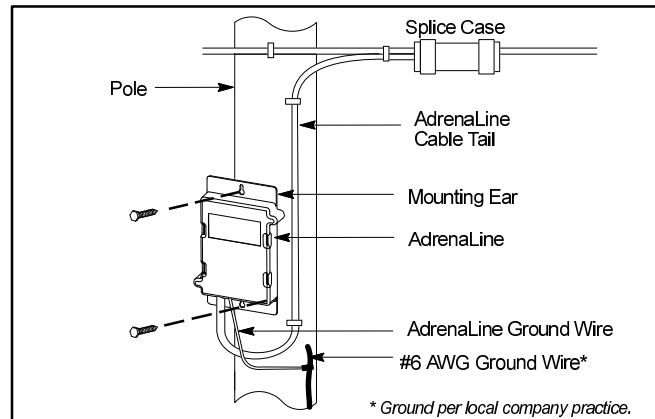


Figure 3. Pole Mounting, CTA-01E, CTA-01L & CRE-01E models

Table 3. Cable-Stub Wire Colors - Express Power

CO side	Tip/Ring	White-Blue/Blue
CPE side	Tip/Ring	White-Orange/Orange
Grd/Power (-48 VDC)	Tip/Ring	White-Green/Green

Table 4. Cable-Stub Wire Colors - Line Power

CO side	Tip/Ring	White-Blue/Blue
CPE side	Tip/Ring	White-Orange/Orange
Not Used	Not Used	White-Green/Green

- IMPORTANT NOTE -

Line-powered AdrenaLine units are polarity sensitive and should be spliced "Tip to White-Blue" and "Ring to Blue" conductors; also, Ring (Blue) must be negative in respect to the Tip (Blue/White).

- EQUIPMENT IDENTIFICATION NOTE -

Charles Industries' equipment is identified by a model and serial number imprinted on it. Please include both the model number and serial numbers when making equipment inquiries.

4. PRODUCT SUPPORT

4.1 Technical Assistance

If technical assistance is required, contact Charles Industries' Technical Services Center at:

847-806-8500 847-806-8556 (FAX)
800-607-8500 techserv@charlesindustries.com (email)

4.2 Warranty & Customer Service

Charles Industries, Ltd. offers 1-year warranty on this AdrenaLine product. Contact your local Sales Representative at the address or telephone numbers below for warranty details. The warranty provisions are subject to change without notice. The terms and conditions applicable to a specific product sale shall be defined in the resulting sales contract.

Charles Industries, Ltd. 847-806-6300 (Cust. Service)
5600 Apollo Drive 847-806-6231 (FAX)
Rolling Meadows, IL 60008-4049 mktserv@charlesindustries.com

Table 5. Physical Specifications, Single-Line Units

Feature	CTA-01E, CTA-01L & CRE-01E	CRE-01L-S Only
Width, including brackets	7 in. (17.8 cm)	5.2 in. (13.2 cm)
Height, including brackets	10.6 in. (26.9 cm)	10.8 in. (27.4 cm)
Height, without brackets	8.125 in. (20.6 cm)	7.7 in. (19.6 cm)
Mounting hole centers	9.25 in. (23.5 cm)	9.75 in. (24.8 cm)
Length, cable stub, BSW 24 ga.	30 feet (9.14 m)	30 ft. (9.14 m)
Length, 14 ga. ground cable	10 feet (3.05 m)	10 ft. (3.05 m)
Depth	2 in. (5.1 cm)	1.5 in. (3.8 cm)
Weight (w/o cable, approx.)	3 lbs. (1.3 Kg)	2.2 lb. (1 Kg)
Operating Temperature	-40° to 150°F (-40° to 65°C)	