

# AdrenaLine™ OSP xDSL Multi-Line Conditioners (5 and 6 Lines) - Installation Guide -

**- IMPORTANT NOTE -**

For the most current, up-to-date, AdrenaLine documentation, always go to [www.charlesindustries.com/main/adrenaline.html](http://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™ Multi-Line series of OSP xDSL Line Conditioners. Figure 1 shows a typical multi-line 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.

### 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 Phylog®y, 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 (hand holes, pedestals) applications, in underground (manholes) applications, or in aerial applications (on poles). They may be rack or wall-mounted using a pole-mount bracket. AdrenaLine units are self-contained stubbed units.

## 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, 1 or 2 pairs are required for power. These pairs will originate from a separate power

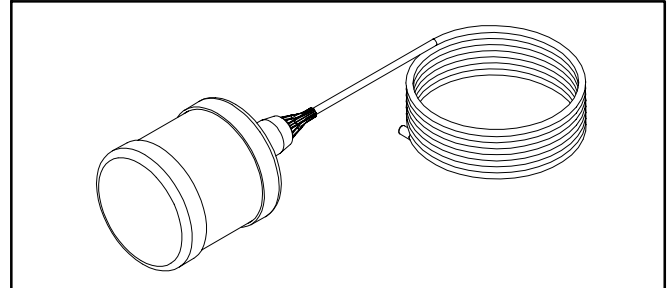


Figure 1. Typical AdrenaLine xDSL Multi-Line Conditioner

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 from the power source, wire gauge, etc. The second power pair acts as a back-up to the first power pair in case additional power is required to power all AdrenaLine units. In addition, the use of both power pairs provides power redundancy to the multi-line conditioner. Reference the Application Note, Powering Multiple Express Power AdrenaLine Units for additional information.

Model		26 AWG Cable* Min.-Max.	24 AWG Cable* Min.-Max.	22 AWG Cable* Min.-Max.
CTA-06L - Line Power, Shorter Loops	Loop Length	6 - 12.6 Kft.	7.6 - 20.2 Kft	9.6 - 32.4 Kft.
	Placement	500 - 1050 Ω	395 - 1050 Ω	310 - 1050 Ω
		3 - 6 Kft.	3.8 - 9.6 Kft	4.8 - 15.4 Kft.
CRE-06L - Line Power, Longer Loops	Loop Length	250 - 500 Ω	197 - 500 Ω	156 - 500 Ω
	Placement	11 - 15.6 Kft.	13.9 - 25 Kft	17.6 - 36 Kft.
		917-1300 Ω	723 - 1300 Ω	570 - 1166 Ω
CTA-05E - Express Power, All Loops	Loop Length	5 - 8 Kft.	6.7 - 12.8 Kft	8.6 - 20.2 Kft.
	Placement	416 - 667 Ω	348 - 664 Ω	280 - 654 Ω
		6 - 17.4 Kft.	7.6 - 25 Kft	9.6 - 33.3 Kft.
Express Power, All Loops	Loop Length	500-1450 Ω	395 - 1300 Ω	310 - 1080 Ω
	Placement	3 - 8.7 Kft.	3.8 - 11 Kft	4.8 - 14 Kft.
		250 - 725 Ω	195 - 572 Ω	155 - 462 Ω

\* Assuming buried cable.

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 per AdrenaLine unit.

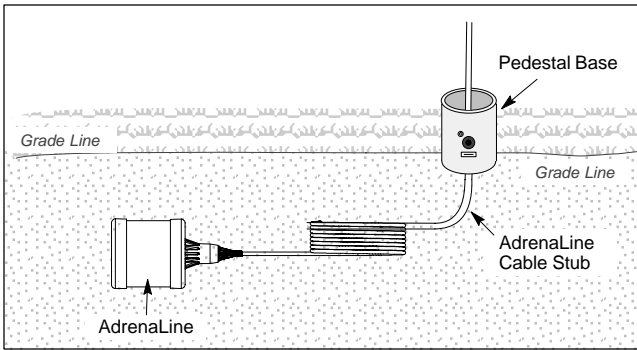
Table 1. Multi-Line Unit Power Limits with AdrenaLine

**- INSPECTION NOTE -**

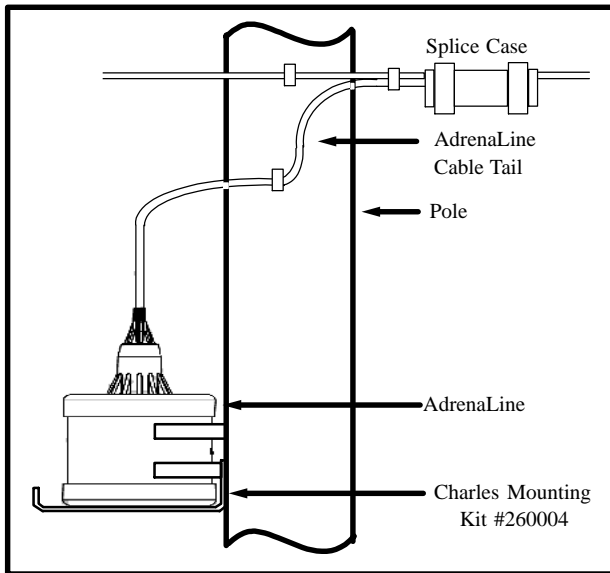
Visually inspect the unit for damage prior to installation. If the equipment was damaged in transit, immediately report the extent of the damage per local company practices and procedures.

## 3. INSTALLATION

See Table 2 for steps to install the Multi-Line series of AdrenaLine™ OSP xDSL line conditioners.



**Figure 2. Buried Placement Example with Buried Cable and Above-Grade Pedestal**



**Figure 3. Aerial Installation Example on a Pole**

**- WARNINGS & CAUTIONS -**

**Do not to damage any buried cables or wires while digging to prepare a hole/trench or to expose cables.**  
**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**

Installing the AdrenaLine™ Multi-Line Unit	
Step	Action
1. □	<b>Select Min/Max loops.</b> Select the minimum and maximum loops to be conditioned by AdrenaLine and determine the length of the different wire gauge sections from the DSLAM to the NID for both loops. If the existing line records are inaccurate, measure the resistance of each wire section by shorting tip to ring at the end of each wire section.
2. □	<b>Select the preferred powering option:</b> - POTS/Power from a switch or DLC: line powered CRE-06L or CTA-06L - POTS/Power from a DSLAM blade: express powered CTA-05E.

3. □	<b>Use calculator to determine min/max/ideal placement ranges.</b> Verify the selected minimum and maximum loops and if successful, determine the minimum and maximum AdrenaLine placement range and the ideal minimum and ideal maximum placement range for both loops by using the calculator, available at:  <a href="http://www.charlesindustries.com/main/adrenalinetool.html">http://www.charlesindustries.com/main/adrenalinetool.html</a> While using the calculator, leave step 3 blank and select CRE-line powered, CTA line-powered, or CTA express-powered in Step 4.
4. □	<b>Decide placement location.</b> Determine a placement location for the multi-line AdrenaLine device that is within the minimum and maximum placement range for both loops and preferably within or close to the ideal minimum and ideal maximum placement range for both loops.
5. □	<b>Qualify/condition loop for ADSL/ADSL2+.</b> If ADSL/ADSL2+ is already deployed on the loops, go to Step 6. If not, qualify and condition the loop for ADSL/ADSL2+ deployment: <ul style="list-style-type: none"> <li>□ Replace existing Load Coils with Smart Coils</li> <li>□ Remove bridged taps</li> <li>□ Qualify the loops for ADSL deployment according to company guidelines. The following typical loop requirements should be met:                             <ul style="list-style-type: none"> <li>□ Insertion loss: less than or equal to 8 dB</li> <li>□ C-Message noise: less than or equal to 20 dBnC</li> <li>□ Longitudinal balance: greater than or equal to 60 dB</li> <li>□ Power Influence: less than or equal to 80 dBnC</li> <li>□ Insulation resistance T-R, T-G and R-G: greater than 5 Meg-ohms</li> </ul> </li> </ul>
6. □	<b>Determine mounting type.</b> AdrenaLine units are mounted in underground (such as in manholes), buried (direct-buried, handholes, and pedestals), or in aerial, rack, or wall applications (using a pole-mount bracket). Consult local company practices to determine the mounting or installation type and the required equipment.
7. □	<b>Route AdrenaLine cable tail.</b> 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.
8. □	<b>Mount or place the AdrenaLine unit.</b> Gather all materials, follow all safety precautions and local codes, prepare the installation site, and mount or place the unit. See Figure 2 and Figure 3.
9. □	<b>Determine, measure, and mark cable tail sheath opening point.</b> 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.
10. □	<b>Score, cut, and open cable sheath.</b> <i>Always follow safety precautions when working with cables and cable opening and cutting tools.</i> Perform the cable sheath opening procedure, per local practices.
11. □	<b>Bond cable tail.</b> Perform cable bonding with a cable bond clamp at the cable tail sheath opening, <i>then bond the cable at the clamp to an approved ground with a bond strap or wire</i> , all per local company practice.
12. □	<b>Perform splicing.</b> Open the splice case and perform splicing per local company practice. Refer to Table 3 and Table 4 as needed.
13. □	<b>Test.</b> 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 Ring side of the AdrenaLine unit.

**Table 2. Installing AdrenaLine**

Slot/Line #	Lead Designation	Wire Color
1	Tip – CO Side	White–Blue
	Ring – CO Side	Blue
	Tip – CPE Side	White–Orange
	Ring – CPE Side	Orange
2	Tip – CO Side	White–Green
	Ring – CO Side	Green
	Tip – CPE Side	White–Brown
	Ring – CPE Side	Brown
3	Tip – CO Side	White–Slate
	Ring – CO Side	Slate
	Tip – CPE Side	Red–Blue
	Ring – CPE Side	Blue
4	Tip – CO Side	Red–Orange
	Ring – CO Side	Orange
	Tip – CPE Side	Red–Green
	Ring – CPE Side	Green
5	Tip – CO Side	Red–Brown
	Ring – CO Side	Brown
	Tip – CPE Side	Red–Slate
	Ring – CPE Side	Slate
6	Power Pair 1 – Tip	Black–Blue
	Power Pair 1 – Ring	Blue
	Power Pair 2 – Tip	Black–Orange
	Power Pair 2 – Ring	Orange

**Table 3. CTA-05E Stub Wire Colors (Express Power)**

Slot/Line #.	Lead Designation	Wire Color
1	Tip – CO Side	White–Blue
	Ring – CO Side	Blue
	Tip – CPE Side	White–Orange
	Ring – CPE Side	Orange
2	Tip – CO Side	White–Green
	Ring – CO Side	Green
	Tip – CPE Side	White–Brown
	Ring – CPE Side	Brown
3	Tip – CO Side	White–Slate
	Ring – CO Side	Slate
	Tip – CPE Side	Red–Blue
	Ring – CPE Side	Blue
4	Tip – CO Side	Red–Orange
	Ring – CO Side	Orange
	Tip – CPE Side	Red–Green
	Ring – CPE Side	Green
5	Tip – CO Side	Red–Brown
	Ring – CO Side	Brown
	Tip – CPE Side	Red–Slate
	Ring – CPE Side	Slate
6	Tip – CO Side	Black–Blue
	Ring – CO Side	Blue
	Tip – CPE Side	Black–Orange
	Ring – CPE Side	Orange

**Table 4. CRE-06L / CTA-06L Stub Wire Colors (Line Power)**

**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 Customer Service**

For customer service, contact Charles Industries at:

Charles Industries, Ltd.  
 5600 Apollo Drive  
 Rolling Meadows, IL 60008-4049

847-806-6300 (Cust. Service)  
 847-806-6231 (FAX)  
 mktserv@charlesindustries.com

**4.3 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 any specific sale of product shall be defined in the resulting sales contract.

- NOTE -

*Important: AdrenaLine line-powered units are polarity sensitive and ring should be negative with respect to the tip.*

Feature	US	Metric
Diameter	8 in.	20.3 cm
Height	16 in.	40.6 cm
Length, cable stub, BSW 24 AWG	30 feet	9.1 m
Weight (with cable)	30 lbs.	13.6 Kg

NOTE: All dimensions and weights are approximate.

**Table 5. Physical Specifications, Multi-Line Units**

Model #	# of Lines	Power
CTA-06L	6	Line Power (shorter loops)
CRE-06L	6	Line Power (longer loops)
CTA-05E	5	Express Power (all length loops)

The availability of features and technical specifications herein subject to change without notice.

**Table 6. AdrenaLine™ Multi-Line Series Model Numbers**