

ADL Vantage

User's Guide

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License required prior to operation of radio communication equipment.



Cautions and Warnings

Throughout this manual this symbol is used to indicate caution or warning. Please pay particular attention to these items to assure safe and reliable operation of your radio modem product.

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Introduction

Welcome

Thank you for purchasing the Advanced Data Link (ADL) Vantage for use with your survey system. The ADL Vantage™ is an advanced, high speed, wireless data link that is designed specifically for GNSS/RTK applications. Your success in using the ADL Vantage is Pacific Crest Corporation's primary goal. Pacific Crest stands behind the ADL Vantage by providing expert support and service. Your comments and questions are welcome.

Scope

This guide provides information concerning the use of the ADL Vantage. This guide is written for the first-time user and gives details concerning system setup, operation and maintenance. We urge you to take the time to review this short manual completely prior to setting up your system.

Note Concerning this Guide

We believe that the ADL Vantage system provides the best value and performance for the user. As such, we provide our equipment in complete turnkey systems, including all of the items necessary for operation with your GPS.

You may have purchased your ADL Vantage from a third party. On occasion, the bundled product provided by these sources may differ from the kits provided directly from Pacific Crest Corporation. If this guide does not accurately reflect the equipment that you received, please contact your supplier for specific instructions concerning the setup of items that differ.

Features and Benefits

Compatible

Facilitates GNSS equipment mix and match

- Interoperable with Pacific Crest RFM and PDL, SATEL, and Trimble radio products
- All models support both 12.5 and 25 kHz channel bandwidth communications
- 40 MHz-wide channel tables (390-430 and 430-470 MHz models)
- Provides upgrade path for existing installations

Enhanced User Interface

Backlit LCD display and five-button navigation interface

- View and change radio channel, modulation and protocol types
- Monitor signal levels, baud rates, and other parameters

Fast Over-the-Air Data Rate

19,200 bits per second

- Reduced latency provides better GPS position information
- Lower power consumption allows longer field operation

User-selectable RF output

Select between 0.1, 0.5, 1, 2 and 4 Watts

- Increase range by switching to 2 or 4 Watts (where permitted)
- Increase battery life by reducing output power when you don't need the range

Rugged Construction

Designed specifically for real-world working environments

- All metal construction and shock mounted electronics ensure highest reliability and EMI-resistance
- Watertight operation stands up to bad weather conditions

Configuring ADL Vantage

ADLCONF Configuration Software

ADLCONF is a suite of software utilities for configuring and troubleshooting Pacific Crest's Advanced Data Link (ADL) line of digital communication radios and modems. Running ADLCONF on a PC attached via serial cable to an ADL radio allows you to check the status of the radio, input channel tables, and set radio parameters such as channel bandwidth and output power.

ADLCONF software is found on the ADL Vantage system CD. The latest version is available for free download from www.PacificCrest.com. A user guide that completely describes how to configure the ADL Vantage radio is available by running ADLCONF and clicking Help > User Guide. The ADLCONF User's Guide is also available on the Pacific Crest website.

Factory Default Settings

You can return your ADL Vantage radio to its factory default configuration using ADLCONF software. Simply click the Restore Factory button to the right of the screen and then the Program button. The factory default settings are as follows:

Radio Link Rate	9600
Modulation Type	GMSK
Sensitivity	Low (Base)
Transmit Power	(there is no default)
Scramble Control	On
CSMA	On
Forward Error Correction	Yes
Transmit Retries	10
TX ACK Timeout	10
Modem Address	0
Destination Address	255
RX Delay	0
TX Delay	2
RX LED Meaning	Signal received

Call Sign:	CALL SIGN
Owner:	(there is no default)
Low Voltage Turn Warning	10 V
Low Voltage Turn Off	9 V
Turn Off LCD Backlight	No
Turn Off LCD Delay	After 20 seconds
Serial Interface	
PC Baud Rate:	38400
Parity:	None
Soft Break Disabled:	Yes
Protocol Mode:	Transparent with EOT Timeout
EOT Timeout:	50
EOT Character:	(not used)
Security Code:	00000000

Table 1 - ADL Vantage Factory Defaults

Setting Up the ADL Vantage

The Standard ADL Vantage Radio Kit

The Standard ADL Vantage Radio Kit consists of the following:

- ADL Vantage radio
- Wall/mains power supply
- Wall plug with adaptor set
- Programming cable
- ADL Vantage CD containing:
 - ADL Vantage User's Guide
 - ADLCONF User's Guide
 - ADLCONF Software
 - PCC Range Estimator

To configure the radio with ADLCONF software,

- Connect the power supply to the main wall current
- Connect the programming cable to:
 - The power supply
 - The ADL Vantage radio
 - Your PC
- Turn on the radio
- Launch ADLCONF software and refer to the section of the ADLCONF User's Guide on connecting the program to your radio.

To operate your ADL Vantage radio in the field you will need an antenna, a portable power supply and a cable to connect to a data source such as a GNSS receiver. Pacific Crest

Corporation and its authorized dealers can provide you with everything you need including a tripod accessory kit and a battery/charger kit.

Antenna and Antenna Mount

If you have an antenna with a male TNC connector, you can attach it directly to the RF connector on the top of the ADL Vantage. We highly recommend, however, that you elevate your RF antenna as much as possible. The most common set up is similar to that seen in Figure 1 where an antenna cable with male TNC connector is attached to the ADL Vantage. The other end of this cable is attached to a tripod or elevated section of range pole. The RF antenna is then attached to the end of the cable. Pacific Crest offers an antenna cable that attaches to standard 5/8-inch threaded tripods and range poles and antennas with NMO connectors.

We recommend inspecting the antenna center push-pin contact to make sure that it makes good contact with the antenna mount. A good antenna connection is critical to system performance.



Although transmitting without an antenna will not cause damage to the ADL Vantage, it is not recommended. Using a gained antenna will raise the Effective Radiated Power of the ADL Vantage radio. Make sure the resultant Effective Radiated Power does not exceed your licensed limit.

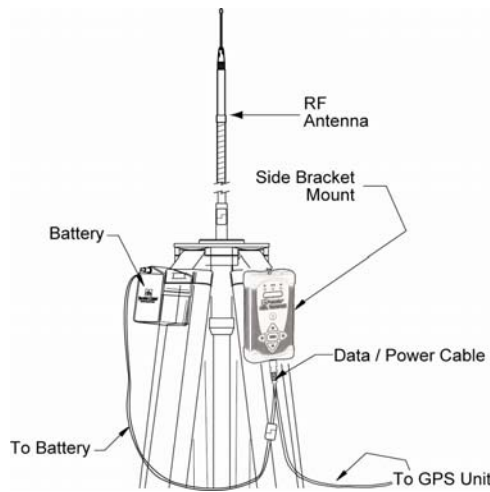


Figure 1 - ADL Vantage Setup

Comment [CB1]: Should show the antenna cable running from the top of the radio up to the bottom of the antenna.

Tripod Side Clip

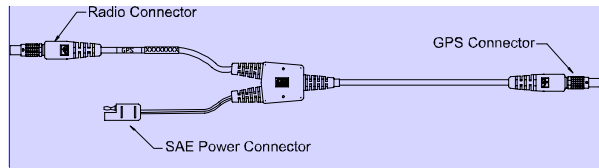
Before connecting any cables, screw the ADL Vantage's tripod clip (PN F01003) onto the back of the radio and insert the clip into the slot on a tripod.



Figure 2 - ADL Vantage Tripod Clip

Data/Power Cable

The ADL Vantage is connected to a data source, such as a GNSS receiver, using a data/power cable (see Figure 3). This cable is available with different connectors for attaching to a large variety of data sources. Contact your Pacific Crest sales representative for selecting the best cable to meet your needs.



Comment [CB2]: Change "GPS Connector" to "Data Source Connector"

Figure 3 - ADL Vantage Data/Power Cable

Each ADL Vantage data/power cable also connects the radio (and in some cases the data source) to external power via an SAE-type connector. Pacific Crest strongly recommends you use the ADL Vantage battery (PN A02663), which includes an SAE connector. This is sold both separately and as part of the ADL Vantage Battery/Charger Kit (PN K01115).

Operating the ADL Vantage

Turning on ADL Vantage

To turn on the ADL Vantage, either attach the programming cable to the radio and to wall/mains current or attach the data/power cable to the radio and the battery. Then press the On/Off button in the center of the front panel seen in Figure 4.



Figure 4 - ADL Vantage

ADL Vantage User Interface

The ADL Vantage front panel includes a two-row LCD display, an On/Off button, four scrolling buttons and a central Enter button. The top row of the ADL Vantage LCD displays the name of the currently selected radio configuration function. The bottom LCD row displays the currently selected option for the displayed function. The selected option is marked with an asterisk. To select another choice for the displayed function, scroll up or down and press the **Enter** button when the desired choice is displayed in the bottom row of the LCD. Press the left/right arrows on the ADL Vantage to move from one function to another. When the radio is turned on, the "Ch TX Freq" function is displayed. Press the Up or Down arrow to display the various parameter choices. The parameter displayed with an asterisk is the currently selected choice.

Function	Displays/Selects...	Choices
Ch TX Freq	Transmitter channel & frequency	01 453.3000 MHz (for example)
		02 453.3250 MHz
		03 454.3600 MHz
		04 455.3950 MHz
Ch RX Freq	Receiver channel & frequency	01 453.3000 MHz (for example)
		02 453.3250 MHz
		03 454.3600 MHz
		04 455.3950 MHz
Radio Link Rate	Over-The-Air link rate for radio transmission/reception	4800

		9600
		19200
		8000
		16000
Serial Baud	Serial baud rate of the radio's data port	2400
		4800
		9600
		19200
		38000
		115200
Modulation	Data modulation type	GMSK
		4LFSK
Data Protocol	Data protocol type	PCC EOT (End of Transmission)
		PCC EOC (End of Character)
		Packet Switched
		TRIMMARK™II/Ile
		TRIMTALK™
		TT450S (HW)
		TRIMMARK 3
		SATEL®
Repeater Mode	Sets the radio to be a repeater	No
		Yes
		If a Trimble protocol is selected:
		No
		Base + 1 Repeater
		Base + 2 Repeaters
		Repeater 1
		Repeater 2
Sensitivity	Radio squelch level	Low (Base)
		Moderate
		High (Rover)
Transmit Power	Transmitter power level	0.1 Watts
		0.5 Watts
		1 Watt (where permitted)
		2 Watts (where permitted)
		4 Watts (where permitted)
CSMA	Carrier Sense Multiple Access	On
		Off
RX LED Meaning	What it means when the RX LED flashes	Signal Received
		Data Received

Signal Strength	Strength of the received signal (RSSI)	RSSI value displayed in dBm
Device Status	Radio identification information	Battery status
		Serial number
		Owner name
		Call sign
		Channel bandwidth (BW)
		TX status
		FW version
Error Code	Error code and brief description	No Error
		01: Voltage High
		02: Voltage Low
		08: Temp High
		11: Memory Error
		15: Tx Frequency Not Locked
		16: Rx Frequency Not Locked

Table 2 – ADL Vantage User Interface Display

Indicator LEDs

The TX LED indicates that the ADL Vantage is broadcasting. In most GPS RTK applications, the TX LED will flash approximately one time per second.

The PWR LED indicates the power status and also provides a low external voltage supply indicator. When lit, power is turned on. The PWR LED will blink to indicate if the external voltage supply is approaching the minimum value. If the PWR LED does not respond to the On/Off button, then the level of the external voltage supply should be inspected.

The RX LED indicates that the ADL Vantage is receiving an RF carrier signal from another radio or from another source of interference. During normal operation, the RX LED will flash at a once-per-second rate indicating the reception of transmissions from the transmitting radio. If the RX LED is on continuously, then a source of interference may be impacting the ability of the ADL Vantage to receive data. Try repositioning the antenna, or changing to another channel at both the transmitter and receiver to reduce or eliminate the interference.

Enclosure

The ADL Vantage enclosure is a tough, impact- and scratch-resistant, aluminum. Elastomer end caps provide the first level of shock protection for the internal components. An additional isolation system inside the enclosure reduces vibration impact to the sensitive radio receiver board.

Antenna Mount

The integrated antenna mount provides an industry standard TNC-female RF connector that is compatible with a wide range of mobile whip antennas.

Battery Care

The ADL Vantage Battery/Charger kit (PN K01115) includes a 12-Volt, 8-AHr, deep-discharge, lead-acid battery. This battery provides all-day operation for the radio and may be recharged approximately 300 times over a period of 3 years.

To power the ADL Vantage with a user-supplied battery, select a deep-discharge battery with a minimum capacity of 8 AHr. Batteries designed for automotive use can be used if necessary but will be damaged by repetitive discharge/charge cycles and are therefore not recommended.

Charging

The charger supplied with the ADL Vantage Battery/Charger kit (PN K01115) provides two-stage charging and should be connected to the battery following every full day of operation to assure good battery life and performance. The first stage quickly charges the battery to capacity and the second stage trickle charges the battery to maintain a full charge.

It is important to periodically charge any battery that is stored for an extended length of time. Storing batteries for an extended time in a discharged state will damage them. To recharge a user-supplied battery, select a charger of appropriate type.

Tips and Techniques for Best Performance

Antenna

Antenna placement is critical for good performance. Range and coverage is directly proportional to the height of the transmitting and receiving antennas in addition to antenna gain. Where possible, select a reference station location that takes advantage of terrain to get the transmitting antenna as high as possible.

Always use the telescoping antenna mast and raise the antenna as high as is practical and safe given terrain and wind conditions.

Do not use a gained antenna if doing so increases the radio's Effective Radiated Power beyond the limit of your license.

Line Loss

Line loss, produced by RF or antenna cables that connect the radio and antenna, decreases the output power (Wattage) transmitted by the antenna, thereby decreasing the signal's range. To minimize line loss, please check the loss-per-length of cable to be used. For every

3dB of line loss, the output power (Wattage) will decrease by half. For example, if you had a 35W radio and had a line loss of 3dB in your cable, the output power would be 17.5W, thereby reducing the range of the radio's signal. Every 6 db of loss will reduce the radio's effective range by 50%.

Power Supplies

Maintain batteries in a fully charged state. The ADL Vantage batteries will last longer if they are not allowed to become completely discharged. We recommend routinely connecting the battery to its charger after every working day and for 24 hours every 3 months during period of non-use. This will assure optimal performance and long battery life.

Equipment Care

Routine equipment care will prolong the life and reliability of your ADL family products. Radio communication equipment is susceptible to damage from shock or environmental extremes. Never operate the ADL Vantage outside the operating specifications contained in Appendix C.

Error Codes

The ADL Vantage performs a variety of power-up and run-time tests to assure optimal operation. Tests include environmental as well as electrical measurements designed to avoid damage to the unit while maintaining adequate operation. In the event of an error condition, an error code is displayed on the LCD screen and the Power LED flashes the number of the error code (two flashes for Error Code 02, followed by a pause, two more flashes, etc.). Table 3 lists the possible error conditions.

Code	Description
01	Input voltage is too high
02	Input voltage is too low
08	Internal temperature exceeds limit for operation
E11	Memory error
E15	TX Frequency Lock Error
E16	RX Frequency Lock Error

Table 3 - ADL Vantage Error Codes

What to do

- Error Code 01-02: Check battery or power supply voltage level; check power cables; recharge or replace the battery; check the charger.

- Error Code 08: Place the radio in the shade; check the antenna and antenna cables for damage or disconnection; use 19200 radio link rate to reduce duty cycle; select a lower RF power.
- Error Codes 11, 15 and 16: Contact customer service.

To clear error codes, cycle the radio's power by pressing the On/Off button, waiting one full second and pressing a second time. If an error warning persists, contact a Pacific Crest authorized dealer or Pacific Crest Customer Support.

FCC Rules and Regulations

Licensing Requirements

It is the responsibility of the base station owner to comply with applicable rules and regulations concerning the operation of a radio transmitter. In the United States, the FCC regulates the licensing of this equipment.

Application for a license is made by submitting FCC form 600 along with evidence of frequency coordination (if required) and applicable fees. Similar licensing requirements exist worldwide. Penalties for broadcasting without a license can be severe, and may include the confiscation of your radio.

For more information, contact our customer service department.



Warning: Always obey local licensing requirements and restrictions.

Equipment Compliances

ADL Vantage have been tested and found to comply with Parts 15 and 90 of Title 47 of the Code of Federal Regulations. ADL Vantage radios have also been tested and found compliant for type certification and approval in many other countries worldwide.

For more information concerning our worldwide compliances, contact Pacific Crest Customer Service.

Being Part of the RF community

Operation of a licensed radio product makes you a member of the RF community. Be aware that virtually all frequencies licensed are provided on a shared basis with other users. Each frequency dedicated specifically to RTK surveying activities has certain restrictions and limitations. For complete information, refer to Part 90, Title 47, of the Code of Federal Regulations.

Most frequencies sharing data transmissions and voice transmissions give priority to voice users. Be mindful of the persistent nature of a GPS RTK data transmission and always limit your RF transmission output power when performing close-in survey situations to avoid interference

with co-channel users. Pacific Crest recommends using the low RF power setting for construction site and other line-of-site surveys with baselines less than two miles (depending on terrain).



Warning: If you are in conflict with a co-channel user, select another frequency to avoid formal FCC actions. In most cases you are required to vacate a frequency upon complaint by a shared channel voice user.

Most survey operations are itinerant in that the system is moved on a frequent basis. For fixed system installations, you should not use frequencies set aside for itinerant operations, but should coordinate a frequency based on the fixed area operation.

Regulations differ from country to country, so please be aware of the local regulations prior to using radio equipment.

Automatic Station Identification

For operation in the United States, the FCC requires that radio transmitters used for GPS RTK applications periodically broadcast a station identifier. The station identifier is the call sign assigned to you on the station license.

The ADL Vantage supports the broadcast of station identification in a manner that meets the requirements of the FCC. Upon receipt of equipment, program your FCC call sign into the configuration of your ADL Vantage using ADLCONF software. This is only required for transmitters.



Warning: Failure to transmit your station identification is in violation of FCC regulations. Use ADLCONF software to enter your FCC call sign.

Carrier Sense Multiple Access (CSMA)

CSMA is a technology implemented in ADL Vantage base radios to meet the United States Federal Communication Commission (FCC) transmitter requirements. It is illegal to transmit on any UHF radio within the United States without CSMA enabled. CSMA holds off the radio transmission if the frequency is currently being used by a co-channel user. On occasion, you may note that the radio broadcasts stop for short periods of time. Most often, this is a case of co-channel interference and the ADL Vantage base radio is holding off broadcasts due to the FCC mandated CSMA.

GPS RTK equipment is designed to function with intermittent gaps in the data. Heavy co-channel use may limit the ability of the ADL Vantage base radio to transmit the required information. In areas of heavy co-channel usage, try changing channels to a less used frequency.

Contact Information

Customer Support

Quality, technology and service are the hallmarks of Pacific Crest Corporation. We provide easy access to our customer service department to keep you running efficiently.

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Repair info: [RMA Request](#)

Web: www.PacificCrest.com

Support hours are 8 AM to 5 PM Pacific Time. Please visit our [website](#) for up-to-date news and product announcements. Firmware and software upgrades are available from our website, in most cases free of charge.

Sales Contact

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Fax: +31-725-348-288

Warranty

One-Year Limited Warranty

This warranty gives you specific legal rights. You may also have other rights which vary from state to state or area to area.

Pacific Crest Corporation warrants ADL family products, inclusive of cables and batteries, against defects in materials and workmanship for a period of one year from receipt by the end-user.

Exclusions

Should Pacific Crest Corporation be unable to repair or replace the product within a reasonable amount of time, a refund of the purchase price may be given upon return of the product.

The warranty on your ADL Vantage shall not apply to defects resulting from:

- Improper or inadequate maintenance by the customer
- Unauthorized modification, negligence or misuse
- Operation outside of the environment specifications

Warranty Limitations

This warranty set forth above is exclusive and no other warranty, whether written or oral, is expressed or implied. Pacific Crest Corporation specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

Appendix A - Safety Information

Exposure to Radio Frequency Energy

The ADL Vantage is designed to comply with the following national and international standards and guidelines regarding exposure of human beings to radio frequency electromagnetic energy, in addition to protection against harmful interference of neighboring electrical equipment:

- FCC Report and Order FCC 96-326 (August, 1996)
- American National Standards Institute (C95.3-1992)
- National Council on Radiation Protection and Measurement (NCRP - 1986)
- International Commission on Non-ionizing Radiation Protection (ICNRP - 1986)
- European Committee for Electrotechnical Standardization (CENELEC)
- FCC CFR47 Part 15
- FCC CFR47 Part 90
- Industry Canada RSS 119
- ETSI EN 300 113-2
- ETSI EN 300 489
- ACA AS/NZS 4295
- iDA Spec 111
- OFTA STD-1E
- SRRC CMII

Contact your sales representative for model specific country approval.

To assure optimal radio performance and to ensure that exposure to RF energy is within the guidelines in the above standards, the following operating procedures should be observed:

- Do not operate a transceiver when someone is within the distance noted below of the antenna (unity gain).
 - 120 cm (approx. 4 feet) for ADL Vantage @ 4 Watts
 - 30 cm (approx. 12 inches) for ADL Vantage @ 2 Watts
 - 15 cm (approx. 6 inches) for ADL Vantage @ ½ Watt
- Do not operate the transceiver unless all RF connectors are secure and any open connectors are properly terminated.
- Avoid contact with the antenna while operating the transceiver.
- Do not operate the transceiver with a damaged antenna. If a damaged antenna comes in contact with the skin, a minor burn may result.
- Do not operate the equipment near electrical blasting caps or in an explosive atmosphere.



Warning: Changes or modifications not expressly approved by the FCC could void the user's authority to operate the equipment.

Appendix B - Pin-outs and Connectors

ADL Vantage

The ADL Vantage data receptacle is a 0-shell, 5-pin circular connector. For a mating plug, we recommend LEMO PN FGG.1B.305.CLAD.72Z. Refer to Table 4 and Figure 5 for pin assignments and orientation. Figure 5 shows a rear view of the pin-outs (looking from behind the connector).

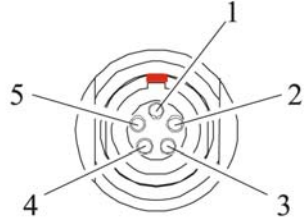


Figure 5 – ADL Vantage Data/Power Connectors

Pin No.	Description
1	Power: 9-30 VDC Input
2	Ground for Power
3	RX (DTE)
4	Signal Ground
5	TX (DTE)

Table 4 - ADL Vantage

Assignments

Base and Rover Pin

Antenna

The ADL Vantage antenna connector is a TNC female. For a mating plug, we recommend Amphenol-brand connectors. Use only high quality 50 Ω impedance cable for the antenna connection.

Most ADL Vantage antennas use industry-standard NMO connectors. The impedance of all ADL Vantage antennas is 50 Ω.

Connector Manufacturer Contacts

Contact LEMO at <http://www.lemo.com>

Contact Amphenol at <http://www.amphenol.com>

Appendix C - Technical Specifications

General Specifications	
Communication	1 RS-232 port, 115.2 kbps maximum
User Interface	Refer to Pin-Outs below
Power	
External	9.0 – 30.0 VDC
During RX	0.6 Watts nominal @ 12.0 VDC
During TX	7 Watts nominal @ 12.0 VDC, 1W RF output 13.4 Watts nominal @ 12.0 VDC, 4W RF output
Modem Specifications	
Link Rate/Modulation	19,200 bps/4FSK 9600 bps/4FSK 19,200 bps/GMSK 16,000 bps/GMSK 9600 bps/GMSK 8000 bps/GMSK 4800 bps/GMSK
Link Protocols	Transparent EOT/EOC, Packet-switched, TRIMMARK™, TRIMTALK™, TT450S (HW), SATEL®
Forward Error Correction	Yes
Radio Specifications	
Frequency Bands	390-430, 430-470 MHz
Frequency Control	Synthesized 12.5 kHz tuning resolution Frequency stability +/- 1 PPM
RF Transmitter Output	Programmable to 0.1 – 4 Watts (where permitted)
Sensitivity	-110 dBm BER 10 ⁻⁵
Type Certification	All models are type accepted and certified for operation in the U.S., Europe, Australia, New Zealand, Russia and Canada
Environmental Specifications	
Operating Temperature (Receiver)	-40° to +85° C (-40° to +185° F)
Operating Temperature (Transmitter)	-40° to +65° C (-40° to +149° F)
Storage Temperature (Receiver/Transmitter)	-55° to +85° C (-67° to +185° F)
Vibration Spec:	MIL-STD-810F
Mechanical Specifications	
Dimensions	3.5" L x 1.809" W x 6.3" H (8.89 cm L x 4.6 cm W x 16.0 cm H)
Weight	567 grams (20 oz.)

Data/Power Connector	5-pin, #1-shell LEMO
RF Connector	50 Ohm, TNC-female

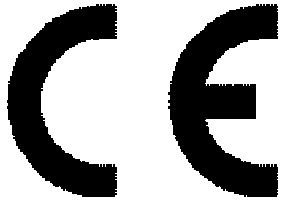
Appendix D – Software

Software Compatibility

Current versions of the following software were tested and verified for compatibility with Windows XP and the Microsoft Business Edition of the Windows Vista operating systems:

- ADLCONF
- PCC Range Estimator

Appendix E – Document of Conformity



EC Type Declaration of Conformity

We, Pacific Crest Corporation
510 DeGuigne
Sunnyvale, California 94085
U.S.A.

declare under our sole responsibility that the product:

ADL Vantage

consisting of the following models:

XXXX 390 – 430 MHz

XXXX 450 – 470 MHz

Comment [CB3]: Input correct

Comment [CB4]: Input correct

following the provisions of the Directives (if applicable):

R&TTE Directive 1999/5/EC
EMC Directive 2004/108/EC
LVD Directive 2006/95/EC

and Standards to which Conformity is Declared:

EMC Requirements:
EN 300 113-2 V1.4.1 (2007-07)
EN 301 489-1 V1.8.1 (2008-04)
EN 301 489-5 V1.3.1 (2002-08)

Safety Requirements:
EN 60950-1:2001 + A11:2004

Place: Sunnyvale, California Date of Issue: May 27, 2009

Comment [CB5]: We obviously need to change this

This Declaration of Conformity is suitable to the European Standard EN 45014 *General Criteria for Supplier's Declaration of Conformity*. The basis for the criteria has been found in international documentation, particularly in ISO/IEC, Guide 22, 1982, *Information on manufacturer's Declaration of Conformity with standards or other technical specifications*.

This declaration is an EC Type Declaration of Conformity as referenced in Annex IV of EC directive 2004/108/EC, *The EMC Directive* and as in Annex III of EC directive 2006/95/EC *The Low Voltage Directive*

Signature

John F. Cameron
(Name)

General Manager

Last 2 digits of year the CE mark was affixed the first time:

(Title)

09

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