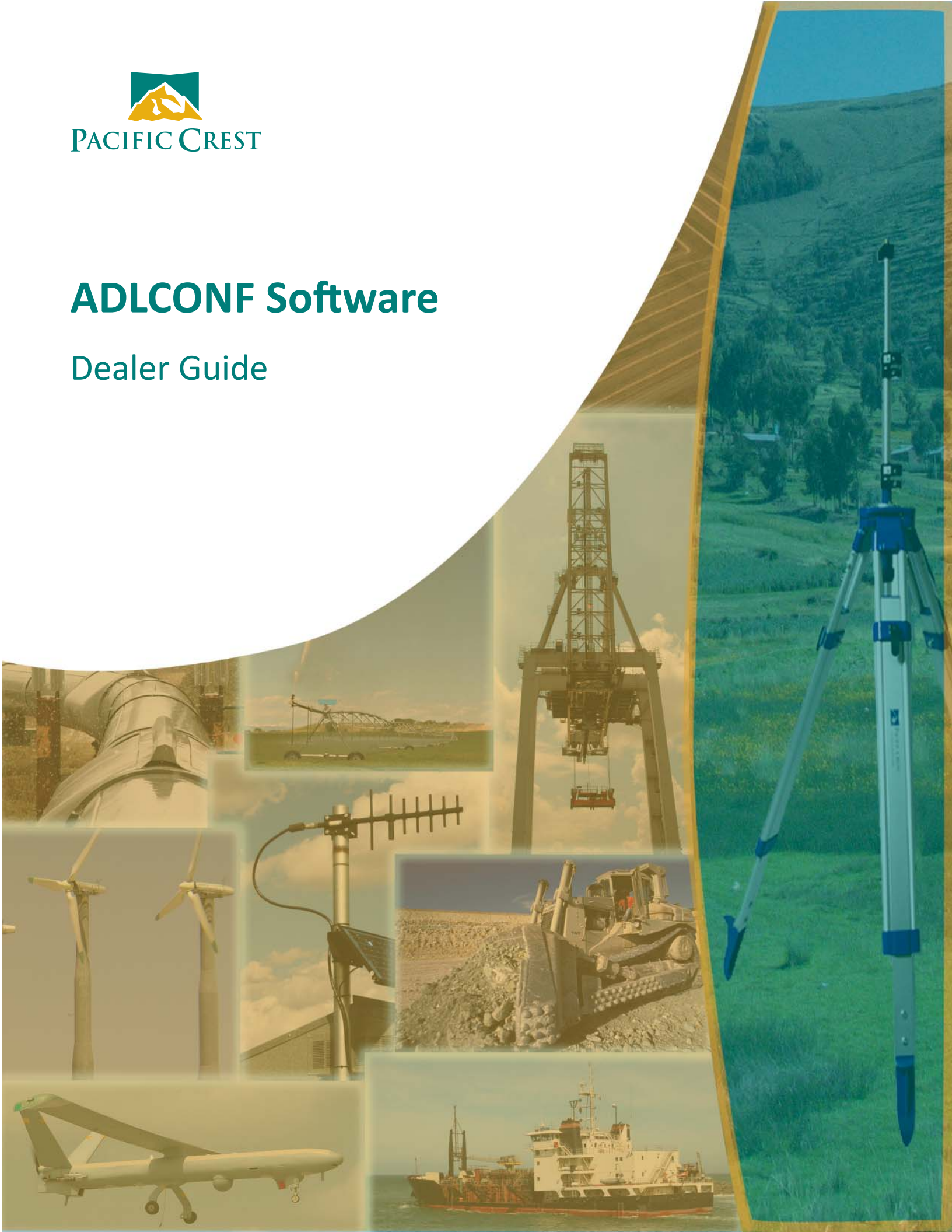




PACIFIC CREST

# ADLCONF Software

## Dealer Guide



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## Contact Information

### Customer support and sales contacts

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

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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, usually free of charge.

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June 2013

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# Introduction

ADLCONF is a suite of software utilities for configuring and troubleshooting the Pacific Crest Advanced Data Link (ADL) line of digital communication radios and modems. It ships with all radio modems in the ADL family and is available for free download from the Pacific Crest website ([www.pacificcrest.com](http://www.pacificcrest.com)). Running the ADLCONF software on a computer attached using a serial cable to an ADL radio enables you to check the status of the radio, input channel tables, and set radio parameters such as channel bandwidth and output power.

There is only one version of the ADLCONF software. To enable extra features for dealers, you must insert the ADLCONF Dealer Software Key (P/N A02672) before you start the software. When you receive your software key, you should install a driver for it by running “Sentinel System Driver [Installer.exe](#),” a program written to your PC’s [C:\Program Files\PacificCrest\ADLCONF\](#) directory when you install ADLCONF.



Starting the software without a software key enables only the *Identification*, *Radio Link*, *Serial Interface*, and *Frequency* tabs. Selecting the *Frequencies* tab enables you to configure receive-only channel tables. Starting the software with the software key attached to the computer replaces the *Frequencies* tab with a *Dealer* tab, so you can configure both receive and transmit frequencies. Only authorized Pacific Crest dealers may possess or use the Dealer software key. Please secure this software key against loss or unauthorized use.

## Technical Support

If you have a problem and cannot find the information you need in the product documentation, contact your local dealer or go to the Support area of the Pacific Crest website ([www.pacificcrest.com/support.php](http://www.pacificcrest.com/support.php)). Product updates, documentation, and any support issues are available for download.

If you need to contact technical support, email [support@pacificcrest.com](mailto:support@pacificcrest.com).

## Your Comments

Your feedback about the supporting documentation helps us to improve it with each revision. Email your comments to [info@pacificcrest.com](mailto:info@pacificcrest.com).

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# Installing the Software

1. Download the latest version of ADLCONF software from [www.pacificcrest.com/support.php?page=updates](http://www.pacificcrest.com/support.php?page=updates), saving it to a folder on your computer.
2. Extract the contents of the zip file.
3. Some firewalls prevent the download of executable files, so the software installer is named [ADLCONF\\_setup.xxx](#). Right-click the file, select the *Rename* option and then change the “xxx” to “exe”.
4. Double-click the installer file to install the ADLCONF software.

**Note** – *If you are running the Windows 7 operating system, you must have Administrator rights to install the ADLCONF software.*

## Running the Software

Do one of the following:

- Double-click the ADLCONF icon on the computer desktop.
- Click *Start / All Programs / Pacific Crest / ADLCONF / ADLCONF*.
- Click *Start / Run*, enter [C:\Program Files\Pacific Crest\ADLCONF\ADLCONF.exe](#) and then click **OK**.

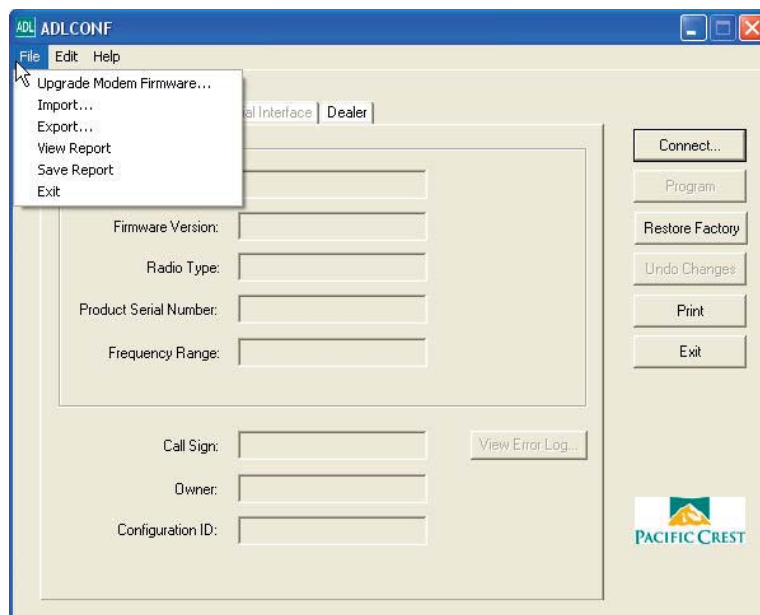
If you have problems running the ADLCONF software on Windows 7 or a 64-bit computer with the Windows Vista® operating system, do the following:

1. Close the software.
2. Double-click **My Computer** or start Windows® Explorer.
3. Navigate to [C:/Program Files/Pacific Crest/ADLCONF/](#) and then right-click [ADLCONF.exe](#).
4. Click **Properties**.
5. In the *Compatibility* tab, click **Run this program in compatibility mode for**.
6. Select *Windows XP, Vista 32* or *Windows 7* and then click **OK**.
7. Restart the ADLCONF software.

# ADLCONF menus

The main ADLCONF dialog contains three main menus: *File*, *Edit*, and *Help*.

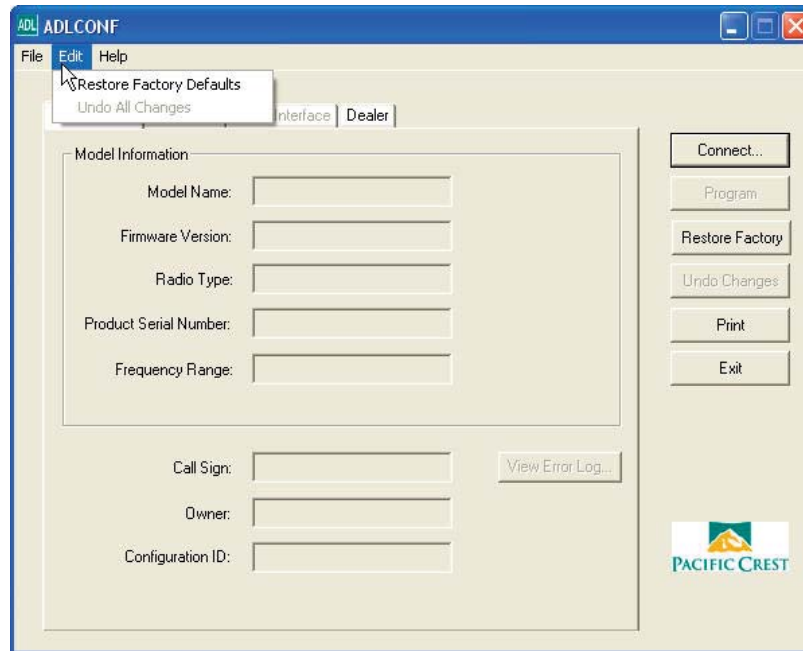
## File menu



| Select...              | to...  |
|------------------------|--|
| Upgrade Modem Firmware | <p>select a firmware file (*.bin format) to upload into the attached ADL radio modem. Pacific Crest recommends that you save the radio's current configuration to your computer before upgrading firmware. Use the <i>Export</i> option described below to save the configuration. Before upgrading the firmware, the software prompts you to connect or reconnect to the radio. See <a href="#">"Connecting to the Radio"</a> on page 10.</p> <p><b>Note:</b> if you wish to upgrade the firmware of an ADL radio module embedded within another product, that product may restrict you to using only one baud rate. If so, you must select a special version of firmware made especially for this product. Please check with the product's manufacturer or the Pacific Crest web site to obtain this special firmware.</p> |
| Import                 | <p>import radio configuration files (*.dat) from your computer to the ADLCONF software. These files contain the radio parameters displayed and edited on the Radio Link and Serial Interface screens. <b>Click Program</b> to upload the configuration to the attached radio.</p>  |
| Export                 | <p>save the radio configuration (*.dat) to your computer. This enables you to create one configuration and copy it to multiple radios.</p> <p><b>Note</b> – When you export a configuration you only create a *.dat file. To configure a radio, you must view a configuration in the software (either by creating it or by importing an existing configuration) and then click <b>Program</b>.</p>   |
| View Report            | <p>view on a web browser all the configuration parameters of the attached radio. In addition, this HTML-formatted report shows firmware settings that may help Pacific Crest support technicians to diagnose problems if the radio requires service.</p>   |
| Save Report            | <p>save a *.txt copy of the configuration report to any location accessible to your computer.</p>  |
| Exit                   | <p>exit the software.</p>  |



## Edit menu



### Select...

### to...

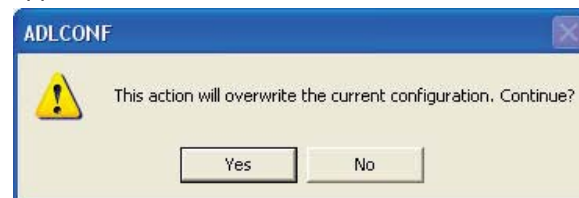
#### Restore Factory Defaults

view the radio factory defaults.

Different ADL radio products use different default configuration parameters. Regardless of how you reconfigure an ADL radio, it always remembers the original default settings. To view the defaults in the software, select *Edit / Restore Factory Defaults* or click **Restore Factory**.

The software must first connect (or reconnect) to the radio. For more information, see [“Connecting to the Radio” on page 10](#).

If the software already shows a radio configuration, the following message appears:



Click **Yes** to copy the default settings from the radio's permanent memory to the computer RAM for review and editing. The radio does not use any changes until you click **Program** in the main dialog or in the *Exit* dialog. When restoring factory defaults, the ADLCONF current channel table is retained.

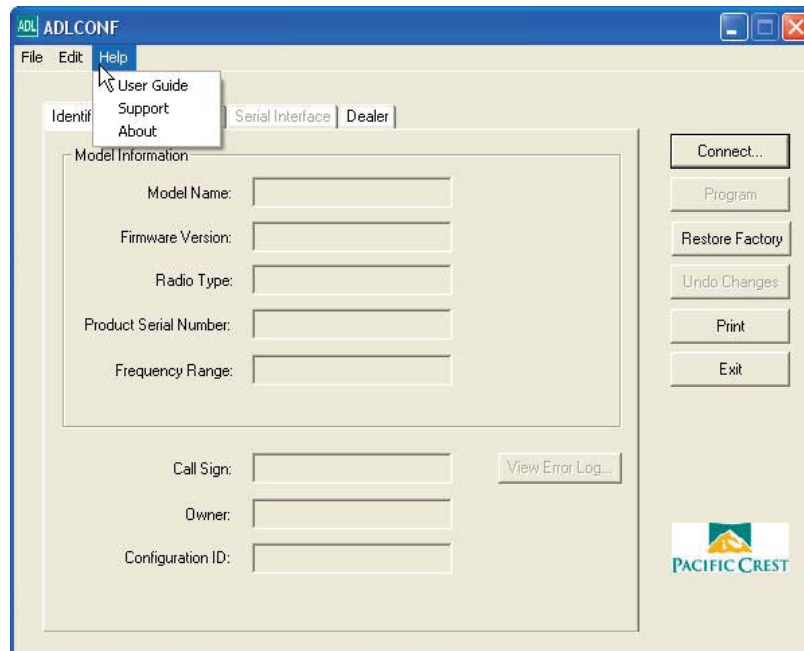
#### Undo All Changes

discard all the configuration changes you made during this session.

Settings on all the ADLCONF screens are reset to what was in effect when you started this session. Selecting *Undo All Changes* does not affect any settings in the radio or any configuration file on your computer. To change the radio configuration, you must make changes in the software and then click **Program**.



## Help menu



| Select...  | to...   |
|------------|---|
| User Guide | view a copy of the ADLCONF User Guide (this document).  |
| Support    | access links to Pacific Crest <a href="#">Technical Support</a> and the Pacific Crest <a href="#">website</a> . |
| About      | view which version of the software is installed on your computer.   |

---

# Connecting to the Radio

To connect the software to an ADL radio:

1. Use the provided programming cable to connect the radio to the computer serial port.  
If your computer does not have a serial port, connect the programming cable to a serial-to-USB adaptor cable such as an IOGEAR® Model GUC232A or an FTDI Model UC232R.

The ADLCONF computer communicates only with Pacific Crest ADL radios. You must use the XDLCONF software to communicate with XDL radios, the PDLCONF program to communicate with PDL radios, and RFMCONF software to communication with RFM radios. The software is available for free download from [www.PacificCrest.com](http://www.PacificCrest.com).

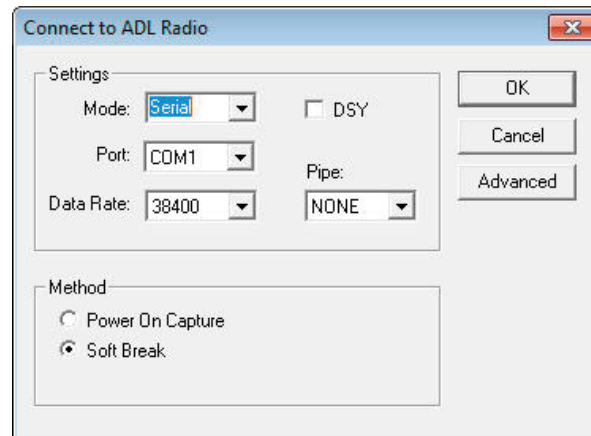
2. Attach the ADLCONF Dealer Version software key to your computer's USB port.
3. Start the software.

The radio turns on when it is connected to power.

4. Click **Connect** on the right of the screen.

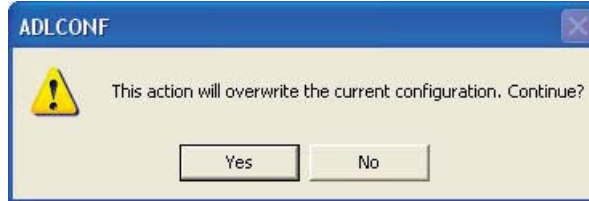
***Note** – When the ADLCONF software connects to a radio, it copies the radio settings to the computer's memory and overwrites any other settings that may be currently displayed. If you had made any edits to the copy of the file in the computer memory and then click **Connect**, the ADLCONF software does not ask you if you want to save the settings from the memory to a file on your hard drive.*

The following dialog appears:



5. To connect to an ADL radio that is connected to the PC via a serial cable, select Serial in the Mode box. Then, select the COM port that the radio is connected to (from the *Port* list) and then select a baud rate (from the *Data Rate* list).

- 
6. To connect to an ADL radio that is connected to the PC via the Internet, select TCP in the Mode box and type in the IP address of the radio.
  7. To connect to an ADL radio embedded in an Ashtech GNSS receiver, check the DSY box and select the number of pipes.
  8. When done, click OK on the Connect to ADL Radio window and click **Yes** to overwrite the current configuration:



9. To establish a connection, select one of the following:
  - Power On Capture. Turn off the radio. Select the *Power On Capture* option and then click **OK**. **Within 10 seconds**, turn on the radio.

The radio accepts a packet switch command (at the selected baud rate) that puts the radio into command mode.

- Soft Break (the default method). Ensure that the radio has been turned on for at least **four seconds** and then click **OK**.

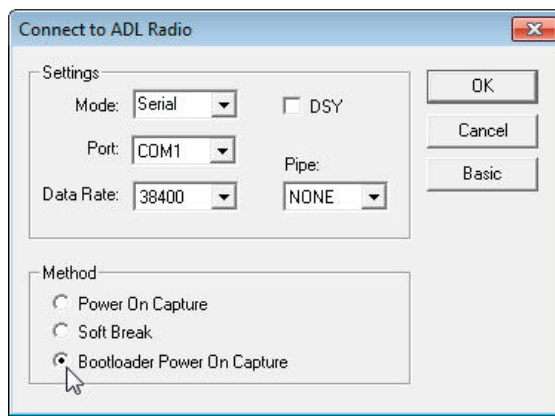
This sends a soft break, (ASCII string “+++”) to the radio at the selected baud rate, which puts the radio into a mode to accept commands from the ADLCONF software (“command mode”).

**Note** – *If the ADL radio was previously connected to any external device (for example, a computer, a GNSS receiver, or a measurement device) while using a data rate other than that shown, the software detects non-communication at the displayed rate and cycles through the other rates to establish a connection. Some versions of the Windows operating system, and some serial communications drivers, can prevent this connection; if communication fails, do the following:*

- a. *Turn off the radio.*
- b. *Disconnect it from the computer.*
- c. *Reconnect the radio, but do not turn it back on.*
- d. *Use the Power On Capture method for connection (see above).*

If neither of these methods establishes a connection:

1. Turn off the radio and then click **Advanced**:
2. Select the *Bootloader Power On Capture* option and then click **OK**:



3. **Within 10 seconds**, turn on the radio. The bootloader firmware puts the radio into monitor mode that will accept commands.

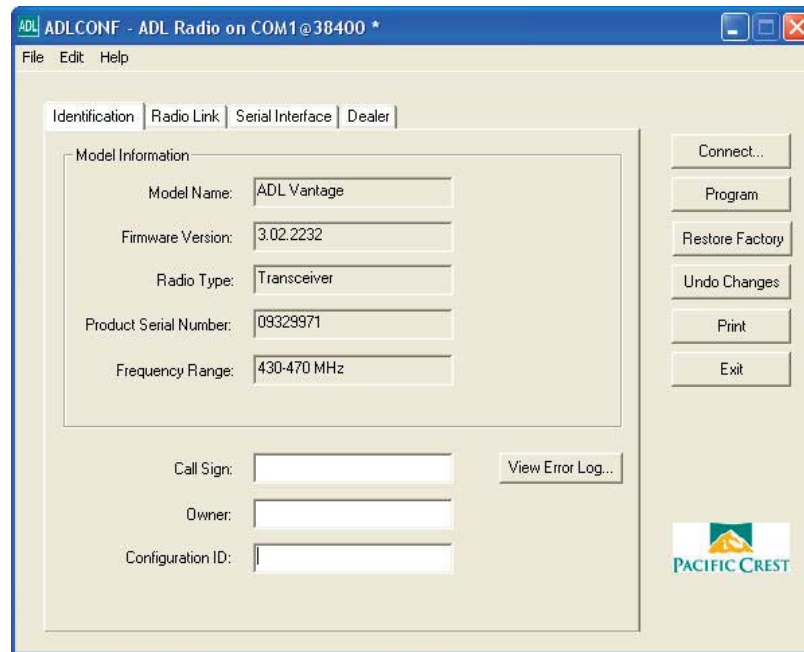
## Demo mode

To simulate connection to an ADL Foundation modem, you can run the software in Demo mode:

1. Start the software.
2. Press [Alt]+[D] and then click **OK** on the *Demo Mode* dialog.
3. Click **Connect** in the main dialog and then follow the steps in [Connecting to the Radio](#), page 10.
4. The software uses a pre-set demonstration radio configuration, so you can view the software features and settings as though you were connected to a radio.
5. You can load an existing radio configuration file (\*.dat) to simulate being connected to that radio; select *File / Import*. You cannot export configuration files in this mode.
6. To create a configuration file, select the **Dealer** tab and then click **Create new .dat.** file For more information, see [page 10](#).

# Identification Tab

Connecting to the radio displays the ADLCONF *Identification* screen:



This screen shows the current configuration of the attached radio:

- Model Name
- Firmware Version
- Radio Type (“Transceiver” or “Receiver Only”)
- Product Serial Number (an 8-digit number where the first two digits are the year of manufacture, the next two digits are the week of manufacture and the last four digits are incremented from 0001)
- Frequency Range

You cannot edit these fields.

The *Identification* screen also enables you to enter a call sign, owner name, and configuration ID.

For operating in the USA, the FCC requires that radio transmitters periodically broadcast a station identifier every 15 minutes. The station identifier is the call sign assigned to USA operators on their station license. The call sign is transmitted in Morse code. It is not included in any data packet and so is ignored by the receiving radio. However, data transmission is interrupted for a few seconds while the call sign is being transmitted. If you leave the call sign field blank, a radio programmed with this configuration file will not transmit any call sign. If you are operating outside the USA, ask your local authority if you need to transmit a call sign.

The *Configuration ID* field is a user-friendly way to identify which configuration has been loaded into the radio. It can be different from the \*.dat filename used when exporting (saving) the configuration using the *File / Export* function.

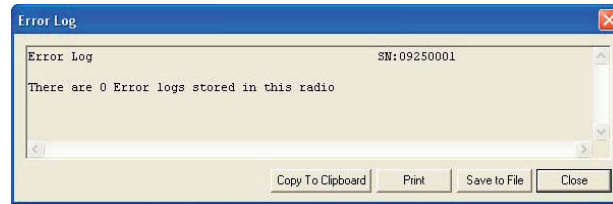
When configuring an ADL Vantage Pro radio, you can select the language that will be used on the radio’s front panel. The options are English, Chinese, and Russian. When configuring

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an ADL Vantage radio, only English is supported.

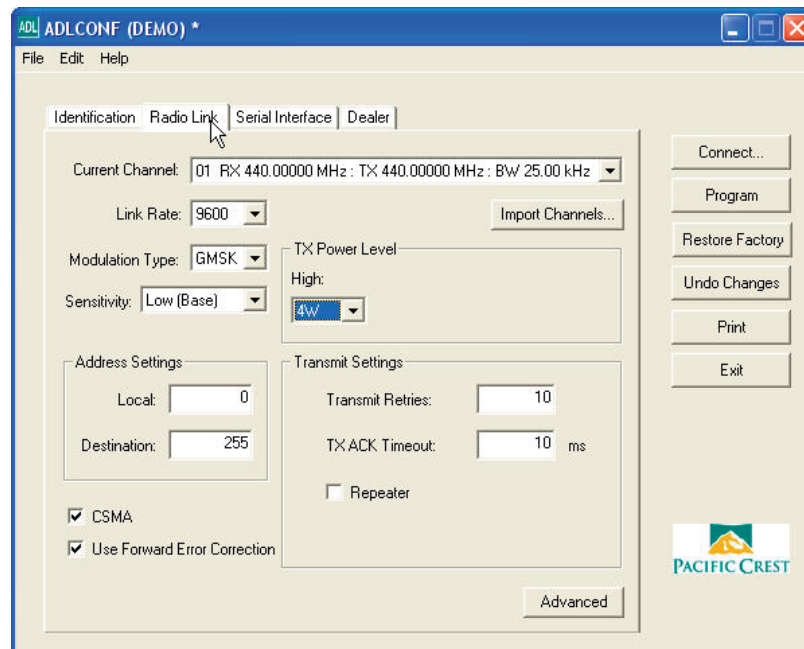
To save the call sign, owner name, and configuration ID to the radio, click **Program**. To save any configuration changes to a file on your computer, select *File / Export*.

ADL radio modems record error logs in the field if the modem experiences a problem. To view this log, click **View Error Log**:



## Radio Link Tab

This settings available vary according to the radio protocol selected in the *Serial Interface* tab. The following example shows the settings available when the Transparent EOT protocol is selected:



## Current Channel

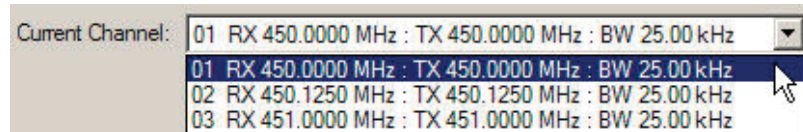
Channel tables are lists of radio parameters comprising:

- Channel numbers (from 1 through 32)
- Frequencies at which the radio receives data on each channel
- Frequencies at which the radio transmits data on each channel (this may be different from the receive frequencies)

- One channel bandwidth (25 kHz or 12.5 kHz) for all channels in the table
- An optional list of radio serial numbers that can read the channel table

Dealers must create a channel table based on the user's radio license and upload it into the radios before delivery. Pacific Crest instructs users who did not receive a channel table with their ADL radio, to contact their dealer.

The radio channel table can contain more than one channel, but the radio can be set to only one channel at a time. The *Current Channel* field indicates the current setting. The list to the right of the field shows all the channels in your channel table. To select another channel, click it:



**Note** – The radio is not set to this new channel until you click **Program**. While all ADL radios can be reconfigured using the ADLCONF software, some models have user interfaces that enable you to select other channels on the front of the radio, and others must be reconfigured using the ADLCONF software.

## Import Channels

Click **Import Channels** to select any other channel table created for your radio by an authorized Pacific Crest dealer. Channel tables are files with the \*.frq file extension. Other channel table files, such as \*.upg files created by the PDLCONF software for PDL-generation radios, are not compatible with ADL radios.

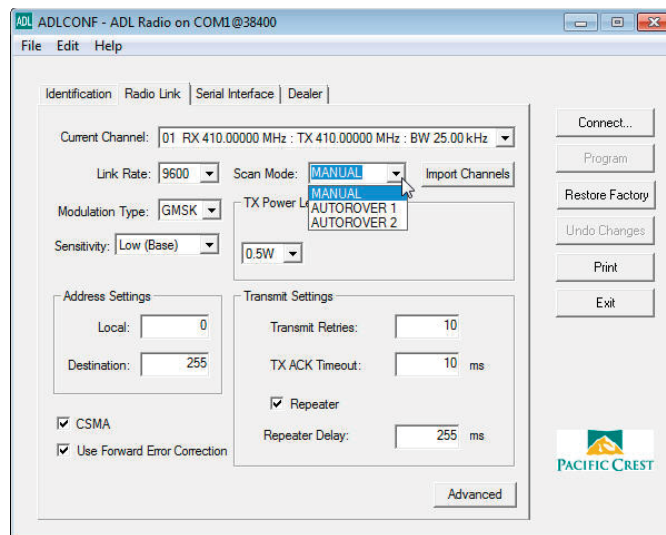
**Note** – Government regulations may require radio users to possess a valid license to transmit data on certain radio frequencies. The standard version of the ADLCONF software does not support the creation of channel tables. All users should check with their dealer about obtaining frequency channel tables, which meet their licensed authorized frequencies or other government regulations.

## Scan Mode

When connected to an ADL Vantage radio, the Radio Link screen will display the Mode option. Select the MANUAL option when you wish to select the channel manually. Select the AUTOROVER 1 option when you want the radio to automatically scan the entire channel table and select the one with the strongest decodable signal.

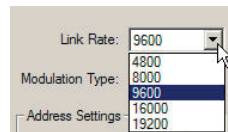
The AUTOROVER 1 option will perform one scan when the radio is turned on and will then reset the radio to MANUAL mode. The AUTOROVER 2 option will perform a scan for the strongest decodable signal when the radio is turned on and will perform a subsequent scan if the percentage of received data packets drops under 90%.





## Link Rate

This is the rate at which data bits are transmitted or received by the radio modem. The radio must both receive and transmit at the same rate. The default link rate for all ADL radios is 9600. You can select a different rate from the list:



## Modulation Type

This enables you to configure your radio for either Gaussian Minimum-Shift Keying (GMSK) modulation or 4-Level Frequency-Shift Keying (4FSK) modulation. The default is GMSK because GMSK is generally less sensitive to interference from environmental noise. However, 4FSK modulation supports approximately twice the data throughput of GMSK. When you are using a link rate above 9600, the general recommendation is to use 4FSK modulation. To switch to 4FSK modulation, select it from the list:



Not all data protocols support 4FSK modulation. If you try to program the radio after selecting a protocol type on the *Serial Interface* tab that is incompatible with the selected modulation type, the following message appears:



For more information, about the supported combinations of radio settings, see [page 39](#).

## Sensitivity

To optimize your radio for operation in different signal or noise environments, select a sensitivity level from the list (PDL radios used the term *Digisquelch*):



In general, have the Sensitivity level of the radio low enough to reject noise, but high enough to accept signal. **Signal** is defined here as the radio energy you want to receive; **noise** is defined as everything else. Suitable sensitivity levels to select depending on both the noise level and the signal level are:

|       |       | Signal |        |
|-------|-------|--------|--------|
|       |       | Strong | Weak   |
| Noise | Loud  | Low    | Medium |
|       | Quiet | Medium | High   |

Signal levels decrease with distance between the transmitter and the receiver. To extend the range, set Sensitivity to Medium or High, although this can increase the amount of noise passed through the radio. At times, it may not be easy to determine the noise level without using a scanner or other RF energy monitor. If you are not sure about the noise level in your work environment, you can use the following guidelines to set Sensitivity:

| GNSS Surveying and similar applications           |      |
|---|------|
| Set Sensitivity to...                             |      |
| GNSS base station radio                           | Low  |
| GNSS rover radio                                  | High |
| Environmental Monitoring and similar applications |      |
| Remote sensor radio                               | Low  |
| Local office radio                                | High |

Environmental noise levels may change throughout a work day and you may need to adjust the Sensitivity setting. Most ADL radios include a user interface that enables you to adjust the Sensitivity in the field without running the ADLCONF software.

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## TX Power Level

If you purchased an ADL radio you can configure it for various output power levels. To adjust the transmit power, select it from the list:

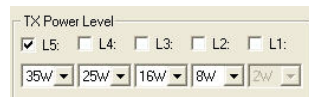


If the radio is a receiver-only, this field is grayed out.

The *Radio Type* field on the *Identification* screen (see above) indicates if the radio is a transceiver or receiver only.

If you are configuring an ADL Vantage Pro radio, this option lets you select four power levels in addition to a low power setting of 2 Watts. You cannot edit the 2 Watt setting. The other four settings can be in any order, but not higher than the Max TX Power, which is set in the *Dealer* tab.

Select the option above the power level at which the ADL Vantage Pro radio will initially transmit.



## Address Settings

Use these fields to set Local and Destination addresses for any two Pacific Crest ADL transceivers to communicate exclusively with each other.

The main advantage of addressing is the ability to restrict the usage of transmitted data to a specified receiver. Any receiving rover radio with a Local address different from the transmitting base radio's Destination address will delete the data without repeating it over the air to other radios or sending it serially to an external device such as a GNSS receiver. Addressing allows multiple transceiver pairs to operate on the same channel without "seeing" each other's data. To do this, the addressed radios need Tx/Rx capability.

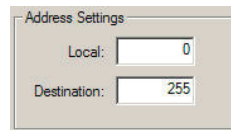
The addressing feature only works between two radios. In addition, both radios must be configured for the Transparent FST/EOT/EOC protocols (from the *Serial Interface* tab). The Local address of one radio must be the same as the Destination address of the other radio, and vice versa. For example, a radio with Local=X and Destination=Y can only communicate with another radio with Local=Y and Destination=X.

**Note** – *There is no standard in the radio community that defines addressing. Each manufacturer does things slightly differently. Therefore, when using radios of different brands in*

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*a communication system, addressing should be turned off on all of them.*

To select a Local or Destination address, click the appropriate field and enter a number between 0 and 254. You can enter only one Local and only one Destination address into any one radio:

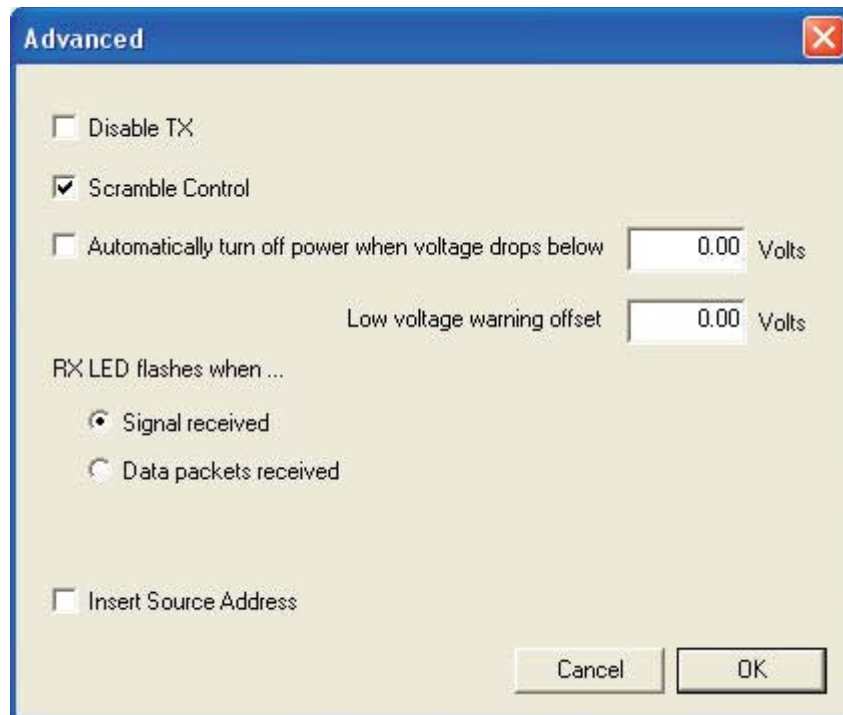
A small dialog box titled "Address Settings". It contains two input fields: "Local:" with the value "0" and "Destination:" with the value "255".

Selecting 255 for the Destination address is a special case designated as ***broadcast mode***. If you enter **255** as a radio's Destination address, all Pacific Crest radios sharing the channel—regardless of their Local address—can receive the data transmissions and either repeat them over the air to other radios or send them serially to an external device.

The default Local address number is 0 and the default Destination address number is 255. If you are not using Transparent EOT, Transparent EOC, or Packet Switched protocol, do not change these defaults.

To insert the local, i.e., source address into each data packet, click the Radio Link screen's **Advanced** button and check the **Insert Source Address** check box.

***Note** – The Local=0/Destination=255 combination is the only selection that works with receive-only radios.*

A dialog box titled "Advanced" with a blue header and a red close button. It contains several settings: "Disable TX" (unchecked), "Scramble Control" (checked), "Automatically turn off power when voltage drops below" (unchecked) with a value of "0.00 Volts", "Low voltage warning offset" (unchecked) with a value of "0.00 Volts", "RX LED flashes when ..." with two radio buttons: "Signal received" (selected) and "Data packets received" (unselected), and "Insert Source Address" (unchecked). At the bottom are "Cancel" and "OK" buttons.

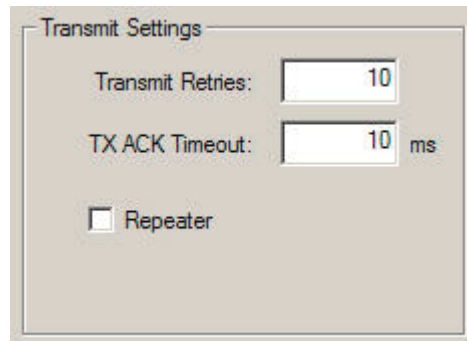
---

## Transmit Settings

When configuring the radio with the Transparent EOT/EOC or Packet Switched protocols, the *Transmit Settings* section of the *Radio Link* screen enables you to configure three aspects of the radio's transmitter:

- Transmitter Retries
- TX ACK Timeout
- Repeater

### Transmitter Retries and TX ACK Timeout



The screenshot shows a dialog box titled "Transmit Settings". It contains three fields: "Transmit Retries" with a value of 10, "TX ACK Timeout" with a value of 10 ms, and a checkbox labeled "Repeater" which is currently unchecked.

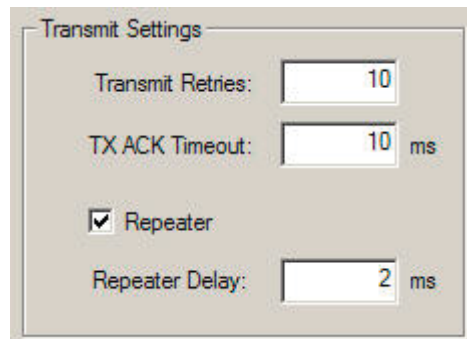
**Note** – Only Transparent EOT/EOC and Packet Switched protocols support transmit retries. So when you select any other protocol (on the *Serial Interface* screen described on page 21), the *Transmit Settings* section of the *Radio Link* screen displays only the *Repeater* check box.

As a general rule, the number of Transmit Retries should be less than the correction update rate (in seconds) times the link rate (in bits per second) divided by the packet size (in bits):

$$(\text{TX Retries}) < (\text{Update rate}) \times (\text{Link Rate}) \div (\text{Packet Size})$$

For example, if you transmit 3300-bit corrections every second at a 9600 bps radio link rate, set the Transmit Retries to less than three because it would take more than one second to transmit 3300 bits three times at 9600 bps, and after one second there will be newer, more accurate corrections to transmit.

Check the *Repeater* check box to configure the radio as a repeater, i.e., to automatically retransmit each data packet it receives. Checking this option displays different fields depending on the selected protocol. If you selected a non-Trimble protocol and then check the *Repeater* check box, the *Repeater Delay* field appears.

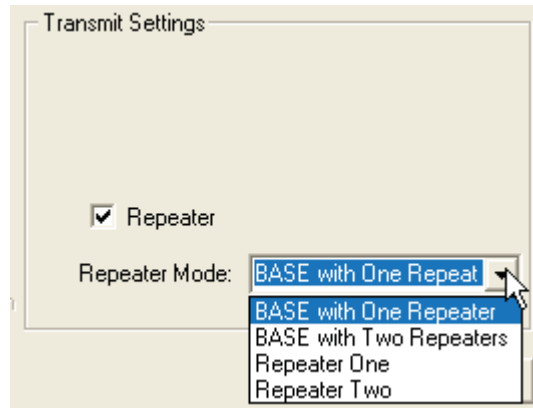


This screenshot shows the same "Transmit Settings" dialog box, but with the "Repeater" checkbox checked. A new field, "Repeater Delay", has appeared at the bottom and is set to 2 ms. The other fields remain the same.

Enter the amount of time you want to elapse between receipt of a data packet and its retransmission. You may enter any value between 0 and 255.

---

If you selected the TRIMTALK 450S, TRIMMARK II/Ile, TT450S (HW), or TRIMMARK 3 protocol and then select the Repeater check box, the following repeater modes become available:



- Select the *BASE with One Repeater* option to configure the attached radio as a base station transmitting GNSS corrections to one repeater radio
- Select the *BASE with Two Repeaters* option to configure the attached radio as a base station transmitting GNSS corrections to two repeater radios
- Select the *Repeater One* option to configure the attached radio as a single repeater or the first of two repeaters
- Select the *Repeater Two* option to configure the attached radio as the second of two repeaters

## CSMA

ADL radios are configured in the factory to have the CSMA feature (Carrier Sense Multiple Access) set to ON. It is illegal to transmit in the United States while CSMA is turned off. When CSMA is activated, the radio will “listen” on the selected transmission frequency for any broadcasts. (The selected transmission frequency is indicated in the *Radio Link* screen’s *Current Channel* field.) If no broadcasts are detected, the radio will transmit any data received on its serial interface. If a radio signal is detected on the selected frequency, the radio will not transmit but waits 3.3 milliseconds before checking again if it is clear to transmit. It continues checking until the frequency is clear.

## Use Forward Error Correction

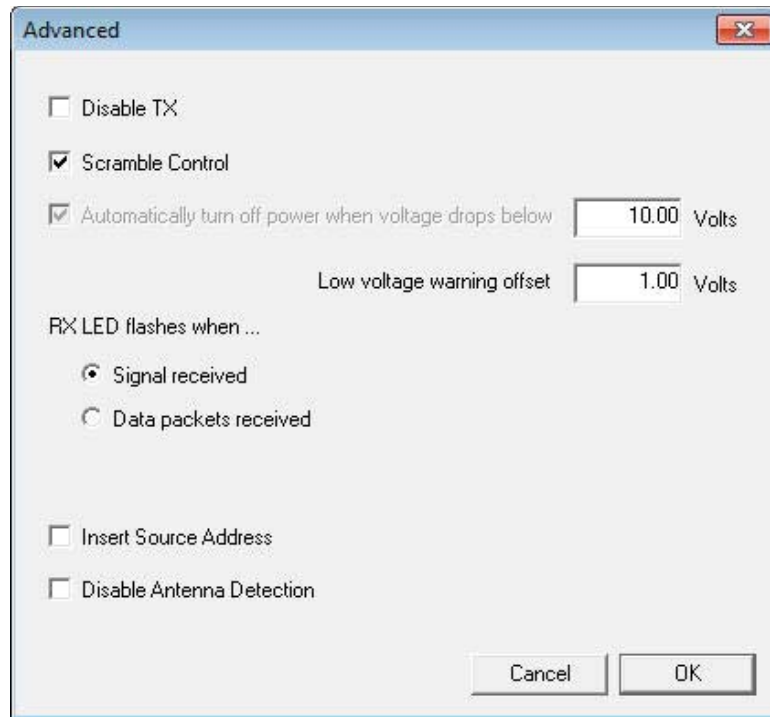
Select this check box to place extra bits in the transmitted data, so that other ADL radios receiving the data can check for transmission errors. Although data throughput is adversely affected, using forward error correction can greatly improve range; Pacific Crest strongly recommends that you use this feature.

The check box is unavailable (grayed out) if you use Trimble protocols, which do not support forward error correction. Select the protocol type from the *Serial Interface* tab.

---

## Advanced settings

Click **Advanced** to access the following controls:



### Disable Tx

Select this check box to disable the transmitter when you need to conduct certain tests of a radio system where you need to ensure that the radio will not transmit. If you select this check box, remember to clear it or the radio will not transmit data.

### Scramble Control

To demodulate a digital transmission, a receiver must synchronize itself with the transmitter. This can be hard to do when the transmitter sends a long series of one's or a long series of zeroes. But if every nth characters in the transmission were switched, a one to a zero or a zero to a one, and if the receiver was expecting this, it could more easily and quickly synchronize itself with the transmission. This is essentially what Scramble Control does and why we recommend you leave it on for all radios.

However, if some of the radios in your system are non-Pacific Crest radios, you may need to turn Scramble Control off.

**Note** – Trimble protocols require Scramble Control. With a Trimble protocol selected, you are unable to turn off Scramble Control.



---

## Automatic turn off

The radio turns off automatically when the input voltage reaches a user-specified level. The default is 9 volts.

You can also select a low voltage warning offset. This is the number of volts above the automatic turn off level at which the radio interface, if it has one, warns you that the radio battery charge is low. With a radio shut off value of 9 V and a low voltage warning offset of 1 V, the radio warns you when the battery reaches 10 V. The radio turns off when the battery reaches 9 V.

If you are configuring an ADL Vantage Pro radio, the Automatic turn off feature is on and grayed out. Because of the higher transmit power of the ADL Vantage Pro radio, the battery can be damaged by overdischarge. To prevent this, the radio always warns you of a low battery condition at 11 V and shuts off when the battery discharges to 10 V.

## RX LED definition

If you have a radio with an Rx LED, you can switch the meanings of the LED to one of the following:

- Signal received (RF energy above squelch level is detected) – the default
- Data packets received

## Insert source address

If you check this box, and program the radio with a local address and a destination address, both addresses will be added to each transmitted data packet.

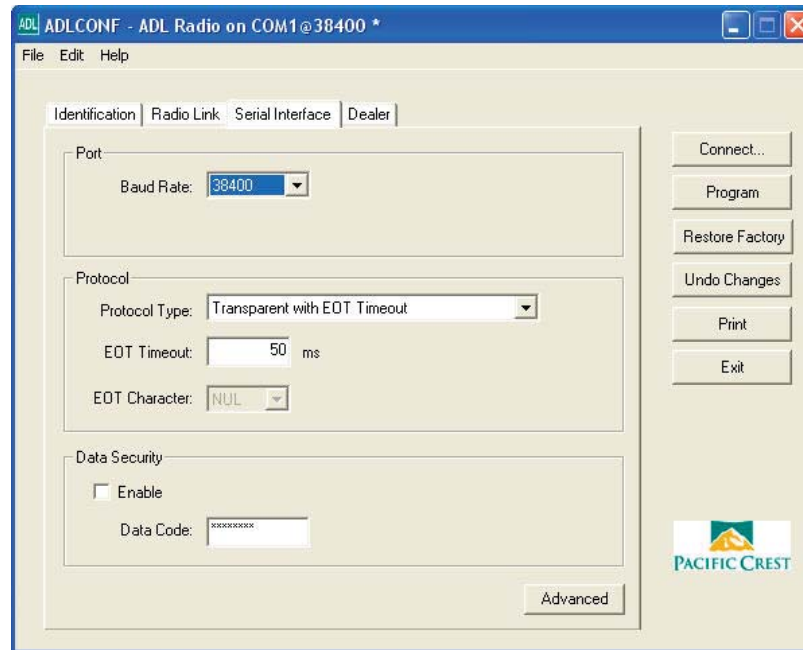
## Disable Antenna Detection

If you are connected to an ADL Vantage Pro only you will see a check box for disabling the antenna detection function, a feature found only in the ADL Vantage Pro. This feature protects the radio from transmitting at high power without an antenna, with a damaged cable or with an antenna that does not support the radio's transmit frequency (antenna mismatch). If you disable this feature you must ensure that you never transmit without first manually checking the antenna and cable.

---

# Serial Interface Tab

This tab has the following controls:



In this tab, you can configure the serial interface between the radio and external devices such as a computer running the ADLCONF software, a GNSS receiver, or monitoring equipment.

The way you set up the radio to communicate to your computer is how it will communicate to all external devices (unless your radio is a model with a user interface on its front panel that enables radio configuration in the field). First, determine which parameters the GNSS receiver or external equipment requires in the field for serial communications and then enter these same settings in the *Serial Interface* tab.

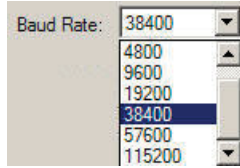
Serial communications require a serial port consisting of a software driver running in conjunction with the operating system and a physical port—usually a DB9 connector. If your computer, GNSS receiver, or other external device does not have a serial port, you can use a serial-to-USB adaptor cable to connect the radio serial cable to the external device.

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## Port

### Baud Rate

The default baud rate between the computer and the radio is 38400. Select other rates (between 4800 and 115200) from the *Baud Rate* list:



## Protocol

### Protocol Type

You must select a protocol—a set of rules governing the order, syntax, and so on—of the data communicated between the external device and your radio. All radios communicating with one another must be set to use the same protocol.

Select the required protocol from the *Protocol Type* list:

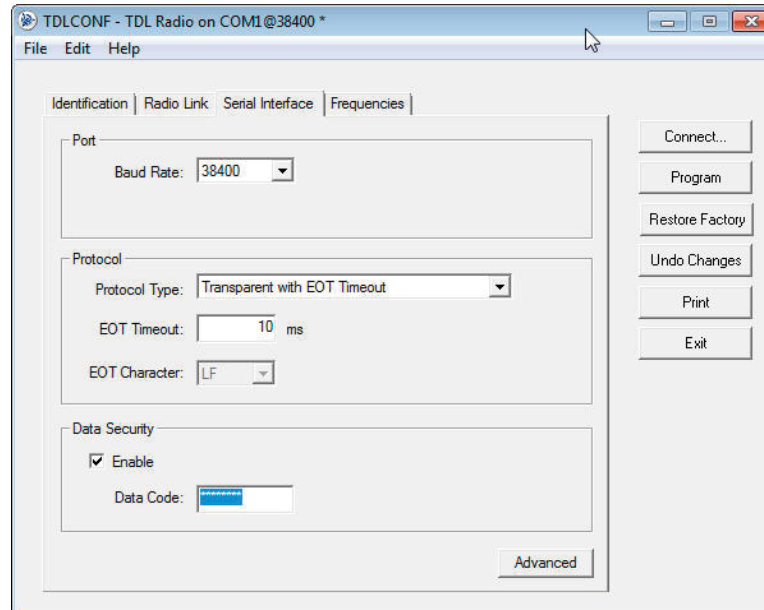
- Transparent with EOT Timeout
- Transparent with EOT Character
- Packet Switched
- TRIMTALK 450S
- TRIMTALK II/IIe
- TT450S (HW)
- TRIMMARK™ 3
- SATEL
- Transparent FST
- South
- Stonex Type 1
- U-Link

| Protocol        | Description   |
|-----------------|---|
| Transparent     | <p>There are three types of “Transparent” protocols, in which the data has no address or frame characters and are thus “transparent.” Radios using transparent protocols, however, must know when the transmission has ended (known as <i>End of Transmission</i> or <i>EOT</i>). There are two ways to do this:</p> <ul style="list-style-type: none"> <li>• With a length of time during which there is no transmission (EOT Timeout)</li> <li>• With a special character (EOT Character)</li> </ul> <p>For systems using Pacific Crest radio modems exclusively, the default setting is Transparent with EOT Timeout. When you select this, enter the time (between 10 and 2560 milliseconds) that signifies the End of Transmission. The default is 50 milliseconds.</p> <p>If you select Transparent with EOT Character, select the ASCII character you want your radios to use. The default is the “NUL” ASCII character. To select another character, select an option from the <i>EOT Character</i> list: NUL, SOU, STX, ETX, EOT, ENQ, ACK, BEL, BS, HT, LF, VT, FF, CR, SO, SI, DLE, DC1, DC2, DC3, DC4, NAK, SYN, ETB, CAN, EM, SUB, ESC, FS, GS, RS, US, SP, QWERTY keyboard characters, and so on.</p> <p>Transparent FST is a Pacific Crest protocol optimized for long distance, high speed/volume data communication. It supports only 4FSK modulation.</p> <p><b>Note</b> – <i>Not all data protocols support 4FSK modulation. A message appears if you try to program the radio after selecting a protocol type that is incompatible with the modulation type you selected on the Radio Link tab.</i></p> |
| Packet Switched | <p>This protocol is unique in that it is a “command” mode. In all other protocols, incoming serial port data is formatted into packets and automatically transmitted. With Packet Switched protocol, external equipment must provide the packet formatting, scrambling, error correction, and housekeeping functions, and send commands to the radio to perform the actual transmission and reception of data. This may be useful in specialized applications where settings, such as channel selection, must be changed “on-the-fly” and the controlling serial port equipment can be programmed to perform these functions.</p>   |
| Trimble         | <p>The ADL radios support the following variations of the Trimble wireless protocol:</p> <ul style="list-style-type: none"> <li>• TRIMTALK 450S</li> <li>• TRIMMARK II/Ile</li> <li>• TT450S (HW)</li> <li>• TRIMMARK 3</li> </ul> <p>Use the ADLCONF software to select the same protocol used on the Trimble radios in your network. To communicate with radios configured to use any other Trimble protocol, set your ADL radio to TRIMTALK 450S protocol.</p>   |
| SATEL           | <p>SATEL is a protocol used by SATEL radios. ADL radios are fully compatible with SATEL radios, but only when set to the SATEL protocol. If SATEL does not appear in the <i>Protocol Type</i> list, select the <i>Radio Link</i> tab and ensure that you have selected 4FSK in the <i>Modulation Type</i> field. (SATEL protocol supports only 4FSK modulation.)</p>  |

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## Data Security

To send encrypted messages, enter any combination of 8 alpha-numeric characters into the *Data Code* field, select the *Enable* check box and then program the radio. Only Pacific Crest XDL, ADL, or PDL radios programmed with this code can interpret data sent by any of the radios—and only when configured to use a Pacific Crest protocol. Although each generation of Pacific Crest radios (XDL, ADL and PDL) must be programmed using the respective generation of configuration software, the data security feature is the same for all products and all types of Pacific Crest radios can be set to use the same code.

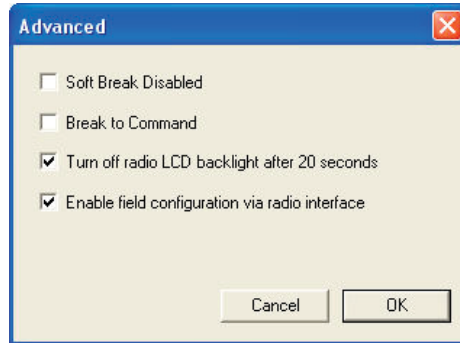


**Note** – If you program a radio to use the Data Security feature, it cannot communicate with any radio that does not use the same code. When you enable this feature for one radio, it is a good idea to enable it for all the radios you will use in the same communication network. Pacific Crest radios with button/LCD interfaces can turn the Data Security feature on or off in the field, but all other Pacific Crest radios must be returned to the office to disable the Data Security feature using the appropriate configuration software.

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## Advanced settings

Click **Advanced** to access the following functions:



### Soft Break Disabled

The ADLCONF software normally connects to a radio using a technique called Soft Break whereby you attach a radio, turn it on and then click **Connect**. Selecting this check box enables you to reconnect to the radio without using the Soft Break technique. This is normally done under the guidance of a service technician to troubleshoot connection problems.

### Break to Command

The Break to Command function configures the radio to accept a hard break signal that puts the radio into command mode. This is useful for systems that allow changing radio settings through external equipment, such as data collectors. Clear this check box for the radio to go into command mode if it detects a hard break.

### Turn off radio LCD backlight after 20 seconds

If the attached radio is equipped with an LCD, this check box configures the LCD backlight to turn off 20 seconds after the last button on the radio interface is clicked. Clear this check box for the radio to leave its LCD backlight on as long as the radio is turned on.

### Enable/Disable Radio Configuration via radio interface

Some radio models include a keypad for configuring the radio in the field. To prevent field configuration, clear this check box and then click **OK** to return to the main screen. Click **Program**. To re-enable a radio, clear this check box and then program the radio.

Radios with an LCD display include an *Edit Config* screen that indicates if configuring the radio with the keypad is Enabled or Disabled. The current selection is displayed with an asterisk on the second row of the *Edit Config* screen. To switch the selection, press the down arrow to display the other option and click **Enter**. You are now prompted to enter a passcode, which is 369369 for all ADL radios. To enter this code, press the right arrow to display a 3 on the second row. Then press the down arrow to display a 6 and the left arrow

to display a 9. Press the right, down, and left buttons a second time in sequence. When you see 369369 displayed on the second row of the LCD, press **Enter** and the keypad's ability to configure the radio is changed.

## Dealer Tab

This tab has the following controls:

The screenshot shows the 'Dealer' tab selected in the ADLCONF software. The interface includes a 'Channel' section with input fields for 'RX' (440.00000) and 'TX' (440.00000), a 'Bandwidth' dropdown set to '25k', and buttons for 'Apply', 'Clear', and 'Clear All'. Below this is a table with columns 'CHANNEL', 'RX (MHz)', and 'TX (MHz)'. The table contains 8 rows, with the first two rows populated with frequency data and the remaining six rows marked as '-unused-'. To the right of the table are buttons for 'Serial Numbers' (Manage) and 'Channel Table' (Export... and Import...). At the bottom, there is a 'Max TX Power' dropdown set to '35W'.

| CHANNEL | RX (MHz)  | TX (MHz)  |
|---------|-----------|-----------|
| 01      | 440.00000 | 440.00000 |
| 02      | 440.00625 | 440.00625 |
| 03      | -unused-  | -unused-  |
| 04      | -unused-  | -unused-  |
| 05      | -unused-  | -unused-  |
| 06      | -unused-  | -unused-  |
| 07      | -unused-  | -unused-  |
| 08      | -unused-  | -unused-  |

Use this tab to manage channel tables. Channel tables are lists of radio settings that comprise the following:

- A channel number (from 01 to 32)
- A frequency at which the radio will receive data
- A frequency at which the radio will transmit data (which may be different from the receive frequency)
- A channel bandwidth
- A list of the serial numbers of radios that the User version of the ADLCONF software can program with the channel table.

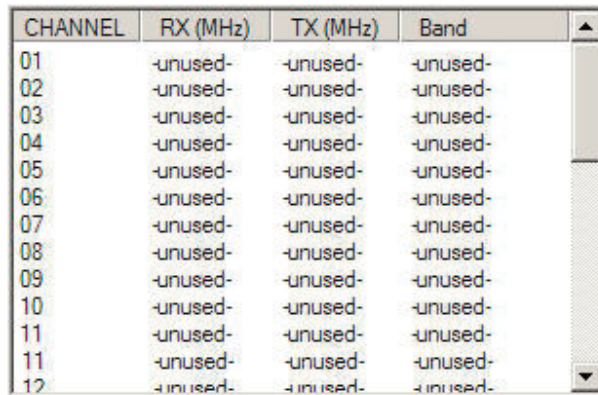
Only the Dealer version of the ADLCONF software can create a channel table with both TX and RX frequencies. (The User version that is publicly available on the Pacific Crest website cannot create channel tables containing TX frequencies.) Once a channel table is created with the Dealer version, it may be programmed into any ADL radio (of the appropriate frequency band) that is connected to the dealer's PC. The User version of the software can program a radio with TX frequencies only if the dealer includes the radio's serial number in the channel table. Therefore, if you wish to send a digital copy of the channel table (a \*.frq file) to a customer, you must enter the customer's radio's serial number into the channel table prior to exporting it.



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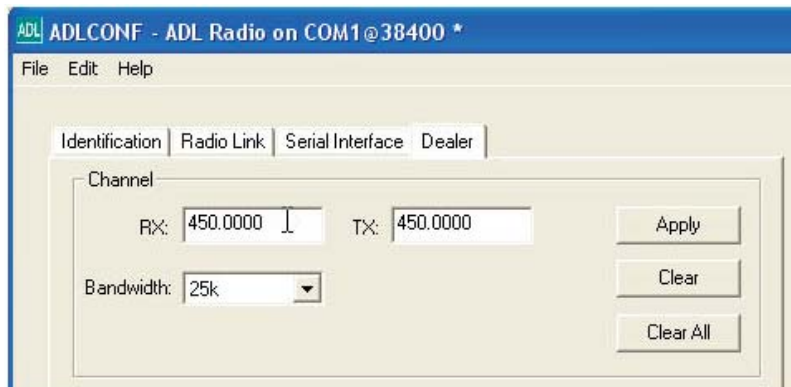
## Creating a channel table

1. Click in the Channel Table window on any channel you want to enter or edit. If all of the channels are identified as “unused”, click on the first channel – identified as Channel 01.



| CHANNEL | RX (MHz) | TX (MHz) | Band     |
|---------|----------|----------|----------|
| 01      | -unused- | -unused- | -unused- |
| 02      | -unused- | -unused- | -unused- |
| 03      | -unused- | -unused- | -unused- |
| 04      | -unused- | -unused- | -unused- |
| 05      | -unused- | -unused- | -unused- |
| 06      | -unused- | -unused- | -unused- |
| 07      | -unused- | -unused- | -unused- |
| 08      | -unused- | -unused- | -unused- |
| 09      | -unused- | -unused- | -unused- |
| 10      | -unused- | -unused- | -unused- |
| 11      | -unused- | -unused- | -unused- |
| 11      | -unused- | -unused- | -unused- |
| 12      | -unused- | -unused- | -unused- |

This highlights the default frequency in the *Rx* field above the Channel Table window:



ADLCONF - ADL Radio on COM1@38400 \*

File Edit Help

Identification Radio Link Serial Interface Dealer

Channel

RX: 450.0000 TX: 450.0000

Bandwidth: 25k

Apply

Clear

Clear All

2. Enter the frequency in the *Rx* field on which you want the radio to receive data on the selected channel.

**Tip** – To transmit at a different frequency from the receive frequency, select the *Tx* field and then enter a value. If you click **Apply** (or press Enter on the keyboard) without

entering a *Tx* value, the ADLCONF software automatically copies the frequency from the *Rx* field to the *Tx* field.

3. Click **Apply** on the *Dealer* screen to configure the selected channel.

To enter a receive-only channel, click on an “unused” channel, select the *Rx* field, enter the frequency on which you wish to receive data and then click **Apply**. Highlight a channel and then click **Clear** to clear the channel’s configuration and reset it to “unused.”

**Note** – This action clears individual channels, but not the whole channel table.

To move a channel up or down in the channel table, click on the channel you want to move and then either click the up or down arrow next to the channel table, or drag-and-drop the channel to its new position.

- At any time you can click the down arrow to the right of the *Bandwidth* field and select the channel bandwidth for the displayed table. Channel tables for ADL radios must be set to either 12.5 or 25 kHz channel bandwidth. If you change the Bandwidth setting while entering channel frequencies, the bandwidth displayed when you click **Apply** will apply to all channels in the table. However, you can create some tables with 12.5 kHz and some with 25 kHz bandwidth and then program any ADL radio with any of these tables. ADL radios can be programmed with only one channel table at a time.

Pacific Crest radio modems use an 18 MHz digitally compensated crystal reference oscillator. The modems emit a minimum of energy at harmonic frequencies, hence minimizing the effect of harmonic interference to other radio users. However, harmonics of the unit's reference crystal at 18 MHz can internally interfere with received signals at frequencies that are exact multiples of 18 MHz: 396, 414, 432, 450, and 468 MHz. To minimize the potential of harmonic interference, avoid using these frequencies.

## Managing serial numbers

The Dealer version of the ADLCONF software can create a channel table and upload it to any attached ADL radio. It can also export a channel table (\*.frq file) that the user can import. This enables dealers to create channel tables and email them to their customers. But, if the channel table contains transmit frequencies, the User version of the ADLCONF software can program the table into a radio, only if the radio's serial number is included in the channel table. To add a serial number to a channel table:

- Click **Manage**. The *Serial Numbers* tab appears:

The screenshot shows the ADLCONF software interface. At the top, there's a 'Channel' section with fields for 'RX' (440.00000) and 'TX' (440.00000), a 'Bandwidth' dropdown set to '25k', and buttons for 'Apply', 'Clear', and 'Clear All'. Below this is a table with columns 'CHANNEL', 'RX (MHz)', and 'TX (MHz)'. The table has 8 rows. The first two rows have values: 01 (440.00000, 440.00000) and 02 (440.00625, 440.00625). Rows 03 through 08 are marked as '-unused-'. To the right of the table is a 'Serial Numbers' section with a 'Manage' button. Below that is a 'Channel Table' section with 'Export...' and 'Import...' buttons. At the bottom, there's a 'Max TX Power' dropdown set to '35W', a 'Country' dropdown set to 'USA', and a 'Create new .dat file' button.

| CHANNEL | RX (MHz)  | TX (MHz)  |
|---------|-----------|-----------|
| 01      | 440.00000 | 440.00000 |
| 02      | 440.00625 | 440.00625 |
| 03      | -unused-  | -unused-  |
| 04      | -unused-  | -unused-  |
| 05      | -unused-  | -unused-  |
| 06      | -unused-  | -unused-  |
| 07      | -unused-  | -unused-  |
| 08      | -unused-  | -unused-  |

- Enter an ADL product serial number in the *Serial Number* field in the bottom half of the window and then click **Add**. (The product serial number of an attached ADL radio is displayed on the *Identification* tab.) All ADL serial numbers are 8 digits long. (The first two digits represent the year of manufacture, the next two digits represent the

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week of manufacture, and the last four digits are serially incremented.).

To delete a serial number from the displayed list, highlight it and then click **Clear**. Alternatively, click **Clear All** to remove all the displayed serial numbers.

To import a list of serial numbers in .txt format, click **Import** and browse to the list on your computer. If you store radio serial numbers in a spreadsheet, you can export the serial number column in Text (Tab delimited) (\*.txt) format. *There should not be more than 8 characters in the file name. If the version of Excel you are using creates tab delimited .txt files that cannot be imported by ADLCONF, open the .txt file with Notepad, save it, and open the Notepad .txt file with ADLCONF.*

**Tip** – All serial numbers for ADL radios made in 2009 must appear in the spreadsheet with “09” at the beginning of the serial number. To prevent the spreadsheet from deleting the initial zero, enter an apostrophe before the zero.

To save the displayed list of serial numbers, click **Export**.

When you are sure of the serial numbers in the *Serial Numbers* window, click **OK**. If you click **Cancel** and exit the window before you export a displayed list of serial numbers, the list is not saved.

## Importing a channel table

To configure a radio using an existing channel table created by the ADLCONF software, click **Import** and then select the required \*.frq file.

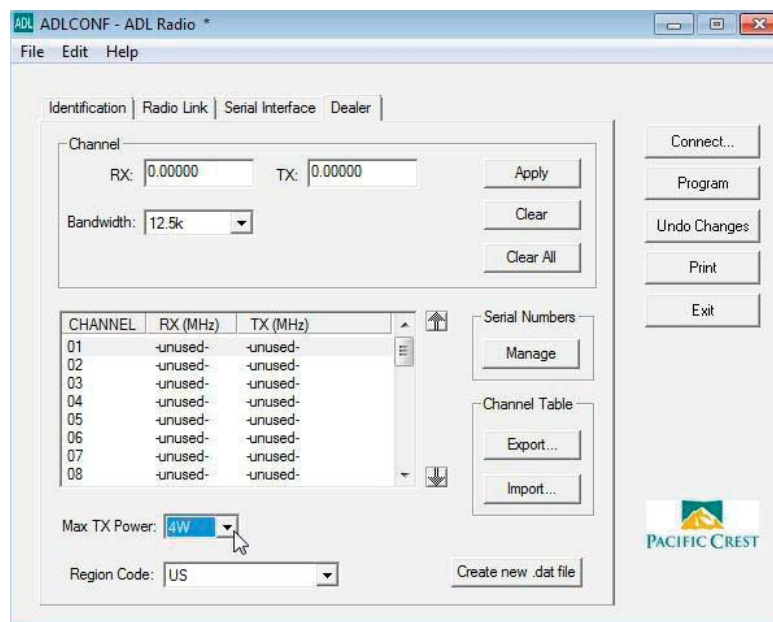
## Exporting a channel table

After you build a channel table and enter a list of serial numbers, you must export the channel table to save it to your computer. Click **Export** and then identify a file name and location for the file.

All radios whose serial numbers are on the Serial Number list can import this channel table using either the Dealer or End User version of the ADLCONF software. You can also program the attached radio to use this channel table, even if its serial number is not on the *Serial Number* list, by clicking **Program** to the right of the main ADLCONF screen (see [Programming the Radio, page 32](#)).

## Setting Maximum RF Output Power

Users can select various RF power output levels for their ADL transceivers using the *Tx Power* field on the *Radio Link* screen. Sometimes regulatory agencies establish the maximum power level, and exceeding this power level can be prohibited by law. Depending on local law, it may be the dealer’s responsibility to set this maximum power output before delivering the transceiver to the end user. To do this, click **Max. Output Power** in the *Dealer* tab:



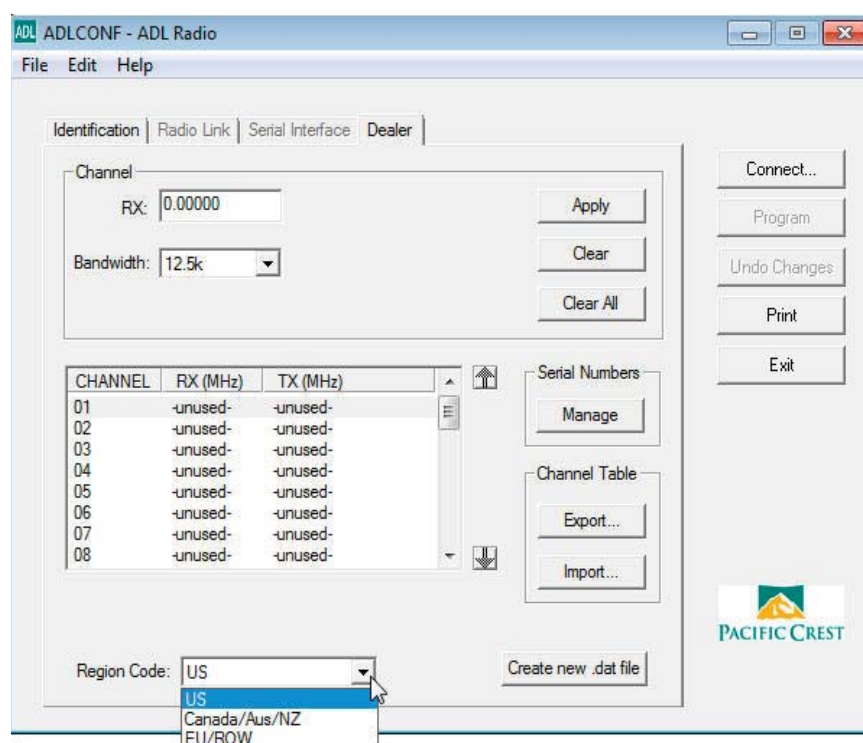
Government regulations may require radio users to possess a valid license to transmit data at certain radio output power levels. **Do not** set the Max. Output Power above the maximum allowed by the customer's license.

You must click **Program** on the right of the main screen to program the attached radio to use this maximum output power. See the next section of this manual for instructions on programming radios.

***Note** – The Max TX Power setting is included in the .frq file upon export. However, the only way to program a radio with a different Max TX Power setting is by directly connecting it to the Dealer version of the ADLCONF software.*

## Region codes

Different countries and regions require radios to be configured in slightly different ways. to configure your ADL radio to meet your country's or region's regulations, click the down arrow next to the region box and select the region appropriate for the end user.



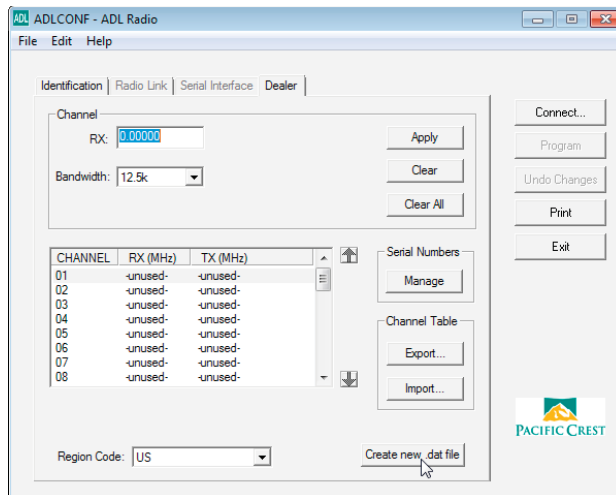
## Creating/Exporting a Configuration File

The Dealer version of ADLCONF differs from the End User version in that it has the ability to edit the following four radio parameters:

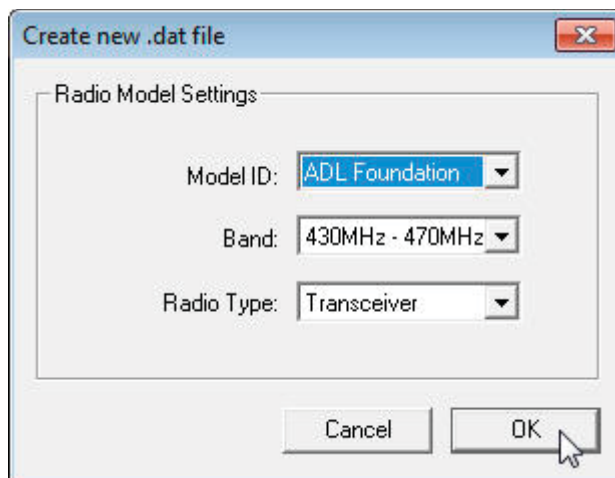
- Channel tables with transmit frequencies
- Channel Bandwidth
- Maximum transmit power
- Region code

All four of these parameters are configured on ADLCONF's Dealer screen and are not editable on the End User version's Frequencies screen or on the radio's front panel interface. However, all four parameters are contained in a single file that you can export from ADLCONF Dealer and email to an end user. The following tech notes tells you how to export this file and how an end user can import it.:

1. Insert the ADLCONF dealer key into the PC
2. Launch the latest version of ADLCONF.
3. Click the Dealer tab and click the Click **Create new .dat file**.



Select the Model ID, frequency band and radio type and click OK

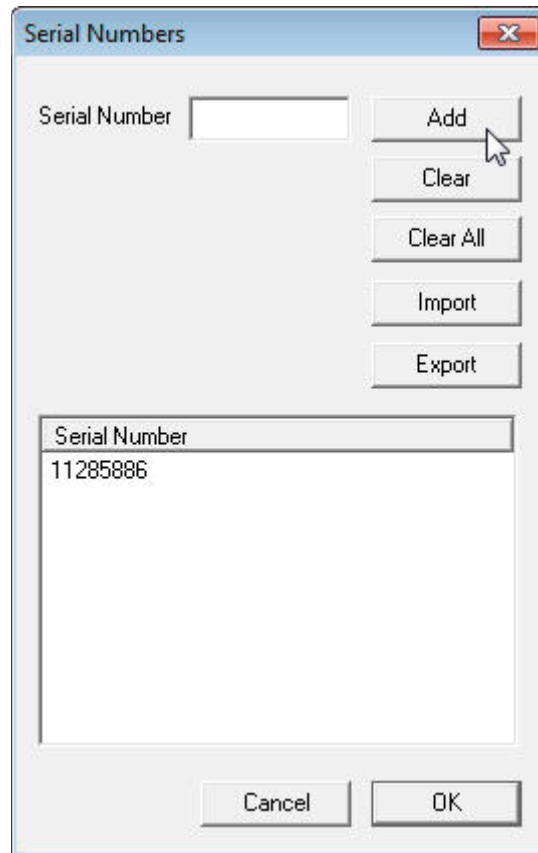


4. [Optional] If you want to send the end user a channel table:
  - Select the channel bandwidth for the channel table, either 12.5 or 25 kHz. All frequencies in a single channel table must have the same channel bandwidth
  - Click the RX window on the Dealer screen, enter the receive frequency for Channel 01 of the channel table, then press Enter on the keyboard
  - If Channel 01's TX frequency is the same as the RX frequency, press Enter a second time. Otherwise enter a different frequency into the TX field and click the Apply button
  - Repeat for all the frequencies in the channel table window
  - If you wish to rearrange the order of the channels, highlight a channel row and click

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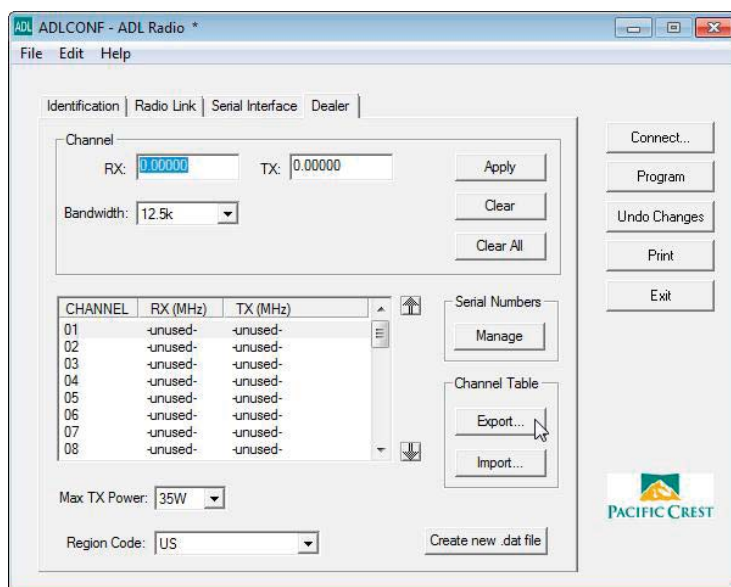
the Up or Down arrow to the right of the channel table window

- To delete a channel, highlight it and click the Clear button
5. When you have completed the channel table (or if you do not wish to create one) click the Serial Numbers: Manage button to the right of the channel table window and type in the target radio's serial number in the Serial Number field at the top of the window. Then click the Add button



6. You can either enter more serial numbers manually or click the Import button and import a list of serial numbers from a comma delimited .txt file
7. To save the list of serial numbers in \*.txt format for later use, click Export
8. When you have entered all the serial numbers of all the radios to be configured with the parameters, click the OK button at the bottom right of the Serial Numbers window
9. This returns you to the Dealer screen. Now click the Channel Table: Export... button and save a configuration file (in \*.frq) format to your PC





10. Email the \*.frq file to the customer

You can also create a \*.dat file containing the parameters displayed on the Radio Link and Serial Interface screens. However, \*.dat files do not include any parameters edited on the Dealer screen.

The end user should do the following:

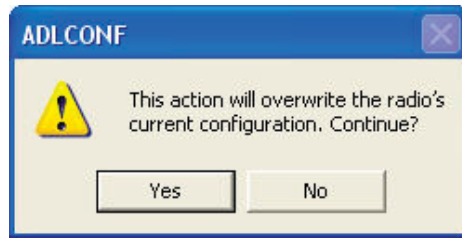
1. Turn on his radio and connect it to the PC
2. Launch ADLCONF and connect it to the radio
3. Click the **Frequencies** tab
4. Click the **Import** button and import the .frq file
5. Make any configuration changes he may wish on the other screens
6. Click the **Program** button

## Programming the Radio

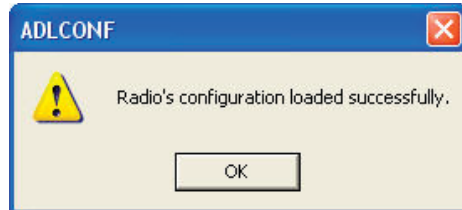
When you start the ADLCONF software, it displays a blank file. Click **Connect** to connect to a radio, and to open a file containing the radio settings. If you edit any settings, an asterisk appears in the title bar. Before you exit the software, click **Program** to save changes to the radio or you will lose them.

To save changes to an ADLCONF file to your hard drive, select *File / Export*.

Whenever you click the **Program** button, you are prompted to confirm you want to overwrite the radio's current configuration:



The following message appears if programming the radio is successful:



After you click **OK** the software will allow you to save the new configuration as a TXT file on your computer. To save the configuration as a DAT file that you can import into other ADL radios, select *File / Export*.

## High Heat Configurations

The amount of heat generated by any transmitter is highly dependent on its configuration. Some configurations cause the radio's transmitter to stay on longer, and the longer the radio is actually transmitting, the more heat it generates. Because this is more of an issue with the 35 watt ADL Vantage Pro radio than with the 4 watt ADL Vantage radio, if you try to program an ADL Vantage Pro radio with a high heat configuration, a warning message with three choices (Cancel, Continue and OK) appears.

If you click the **Cancel** button you are returned to the ADLCONF software without programming the radio. This enables you to change the configuration to one that generates less heat. For example, you can raise the radio link rate or switch to a more efficient protocol such as TRIMMARK 3 or Transparent FST. Both actions halve the time it takes the radio to transmit the data and so halve the amount of heat generated.

If you click **Continue**, your settings are programmed into the radio. The ADL Vantage Pro's Automatic Power Management feature will maintain a safe temperature in the radio.

If you click **OK**, the ADLCONF program will automatically set the maximum transmit power to 25 watts and program the radio. You will not be able to select a higher transmit power using the radio interface, but you will be able to re-configure the radio for higher power with the ADLCONF program.

There are other ways you can reduce the temperature of your ADL radio besides reducing the transmit power. Using a compressed data format such as CMRx can reduce the data

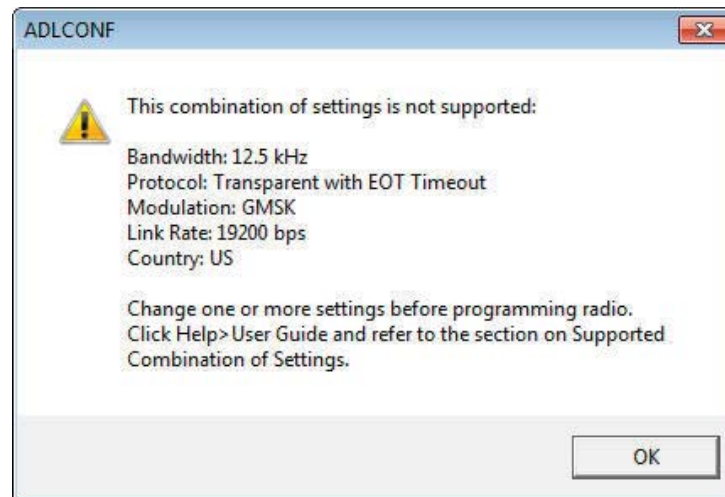
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packet size by as much as 60% allowing the radio to generate 60% less heat. On hot days, keeping the radio above the ground and out of direct sunlight can lower the temperature as much as 20°.

## Supported combinations of radio settings

Different combinations of radio settings – channel bandwidth and protocol - support different radio link rates. Not all combinations support all link rates, which can be confusing until you get used to it. Because the user interface on some ADL radios shows a sequence of screens, it is possible after the user selects the first setting to display only those options on the subsequent screens that are supported. But with ADLCONF, users often move from one screen to another selecting or confirming the correct configuration. For this reason, selecting one parameter in ADLCONF does not restrict your choices for the next parameters.

If you try to program a radio with an unsupported combination of settings, ADLCONF returns the following error message:



The following two tables show the supported combinations. To use the tables, first select the channel bandwidth for the channel table you will use. On the Radio Link screen, look on the far right of the Current Channel field. If you see "BW 12.50 kHz" you are transmitting and receiving on a channel that is 12.5 kHz wide. Use the first table appearing below to see what combinations of protocol and radio link rates are possible. If you see "BW 25.00 kHz" you are transmitting and receiving on a channel that is 25 kHz wide. Use the second table to see what combinations are supported..

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## 12.5 kHz Channel Bandwidth

| Protocol Type                           | Modulation Type | Radio Link Rates (bps) |
|---|-----------------|------------------------|
| Transparent EOT/EOC and Packet Switched | GMSK            | 4800                   |
| Transparent EOT/EOC and Packet Switched | 4FSK            | 9600                   |
| Transparent FST                         | 4FSK            | 9600                   |
| TRIMTALK 450s                           | GMSK            | 4800, 8000             |
| TRIMMARK II/Ile                         | GMSK            | 4800                   |
| TT450S (HW)                             | GMSK            | 4800                   |
| TRIMMARK 3                              | GMSK            | 9600 (USA)             |
| SATEL                                   | 4FSK            | 9600                   |
| U-Link                                  | GMSK            | 4800                   |

## 25 kHz Channel Bandwidth

| Protocol Type                           | Modulation Type | Radio Link Rates (bps) |
|---|-----------------|------------------------|
| Transparent EOT/EOC and Packet Switched | GMSK            | 4800*, 9600*           |
| Transparent EOT/EOC and Packet Switched | 4FSK            | 19200                  |
| Transparent FST                         | 4FSK            | 19200                  |
| TRIMTALK 450s                           | GMSK            | 4800*, 9600*, 16000*   |
| TRIMMARK II/Ile                         | GMSK            | 4800*                  |
| TT450S (HW)                             | GMSK            | 4800*, 9600*           |
| TRIMMARK 3                              | GMSK            | 19200 (USA)            |
| SATEL                                   | 4FSK            | 19200                  |
| South                                   | GMSK            | 9600*                  |
| Stonex Type 1                           | GMSK            | 9600*                  |
| U-Link                                  | GMSK            | N/A                    |

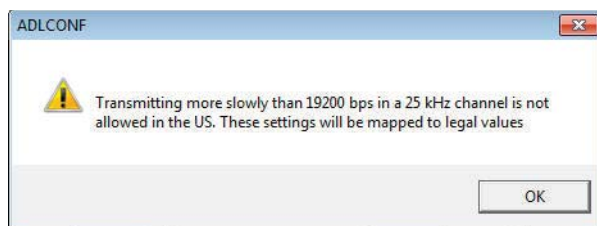
\* According to the US FCC all transmissions within the US in 25 kHz channels must use a radio link rate at least 19200 bps. See the next section on US narrowbanding regulations.

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## US Narrowbanding Regulations

Beginning in 2013, new FCC narrowbanding regulations restrict UHF transmissions within the United States. Data transmission made in 25 kHz-wide channels are restricted to radio link rates  $\geq 19200$  bps. Voice transmissions are not allowed in 25 kHz channels at all. There are no restrictions for license holders for (a) data or voice transmission in 12.5 kHz channels or (b) data or voice reception of any channel bandwidth.

All Pacific Crest radios are programmed by authorized dealers with region codes that ensure the radios adhere to local radio regulations. To adhere to the new law, a new US region code for 2013 prevents transmission more slowly than 19200 bps in 25 kHz channels. If you program a radio with (a) the US region code for operation at (b) 4800 or 9600 bps in (c) 25 kHz channels, ADLCONF warns you that this is not allowed in the US:



The expression “map settings to legal values” seen in this warning message means ADLCONF will automatically change the settings in such a way that the radio remains both legal in the US and compatible with other brands and models of radios configured in the same way. When you click the OK button, you will program the radio with all the selected settings except the channel spacing is automatically reset to 12.5 kHz for as long as the radio remains set to transmit at 4800 or 9600 bps. This is the meaning of “These settings will be mapped to legal values.” If you later increase the link rate to 19200 bps (using ADLCONF’s Radio Link screen or by using the front panel interface available on the ADL Vantage and ADL Vantage Pro), the radio’s channel bandwidth automatically resets to 25 kHz. Because the radio will transmit in 12.5 kHz channels at 4800 or 9600 bps or in 25 kHz channels when set for 19200 bps, the channel bandwidth is displayed as “Ch BW: 25 kHz Max.” The word “Max” on the front panel of an ADL Vantage or Vantage Pro indicates that the radio is set to the US region code and so will operate in channels that are a maximum of 25 kHz – depending on the selected radio link rate..

*Note: This is a change from pre-2013 when a single channel table would work in either 12.5 or 25 kHz channels. Now, with the region code set to “US” and a channel table set to 25 kHz bandwidth, ADL radios will automatically switch to 12.5 kHz channels if the link rate is set to 4800 or 9600 bps and switch back to 25 kHz channels if the link rate is increased to 19200 bps. Thus the radio always operates in accordance with the new FCC narrowbanding regulations.*

### What does this mean for radio network compatibility?

In order for two radios to communicate they must be configured for the same protocol, frequency, modulation type, forward error correction and scrambling. In general, you also want both radios to be set to the same channel bandwidth, but a radio set up for 25 kHz channels will receive data from a radio transmitting in 12.5 kHz channels as long as no one is simultaneously transmitting in an adjacent channel. This ensures that ADL radios configured with the new US region code will remain compatible with legacy radios. Take the case of an ADL radio configured with the new US region code and a 25 kHz wide channel table transmitting to legacy radios that are programmed with the same 25 kHz channel table. If all

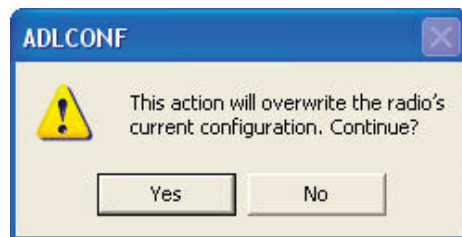
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radios are set to operate at 19200 bps, the ADL radio will transmit and the legacy radios will receive in 25 kHz channels. If all radios are set to operate at 9600 bps, the ADL radio will automatically reset itself to transmit in 12.5 kHz channels in accordance with US law. The legacy radios, though still set to the 25 kHz-wide channel table, will receive the 12.5 kHz signal without any problem.

## Restoring Factory Settings

Different ADL radio products use different default configuration settings. Regardless of how you reconfigure an ADL radio, it always remembers the original default settings. To restore the radio settings to the factory default settings, click **Restore Factory** on the right of the ADLCONF screen or select *Edit / Restore Factory Defaults*.

The ADLCONF software must first connect (or reconnect) to the radio. For more information, see [Connecting the Radio, page 10](#). If the ADLCONF software already displays a radio configuration, the following message appears:



Click **Yes** to copy the default settings from the radio's permanent memory to the computer's memory for review and editing. No changes are made to the configuration the radio will use until you click either the **Program** button on the main screen or the **Program** button on the *Exit* dialog. When restoring factory defaults, the ADLCONF software keeps the current channel table.

## Undoing Changes to Radio Settings

To undo all configuration changes entered in the current session of the ADLCONF software, click **Undo Changes** on the right of the ADLCONF screen or select *Edit / Undo All Changes*.

This action cancels all the configuration changes you have made during the session. All settings on the ADLCONF screens are reset to those that were in effect when you started this session.

Click **Undo Changes** does not affect any settings in the radio or any configuration file on your computer. The only way to change the configuration of the radio is to first make them in the ADLCONF software and then click **Program**.

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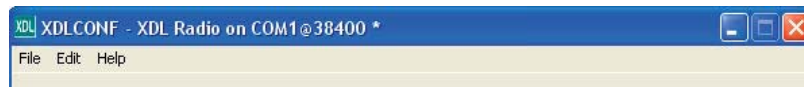
# Printing Radio Settings

To create a file describing the current configuration of the attached radio, select *File / Save Report*. To print the configuration without creating a file, click **Print** on the right of the ADLCONF screen.

On the subsequent *Print* screen, select the printer you want to use and then click **OK**.

**Note** – *The configuration displayed on the ADLCONF software may not be the same as the configuration in the attached radio. The ADLCONF software displays a radio's configuration as soon as you connect to the radio. However, you can import a configuration file from your computer by selecting File / Import. You can also use the ADLCONF software to edit parts of the displayed configuration. The imported or edited configuration displayed on the ADLCONF software is not written to the radio until you click **Program**. If you click **Print** before clicking **Program**, the configuration that is printed is of the radio, not what appears in the ADLCONF software.*

An asterisk in the ADLCONF title bar indicates that the displayed configuration has changed:



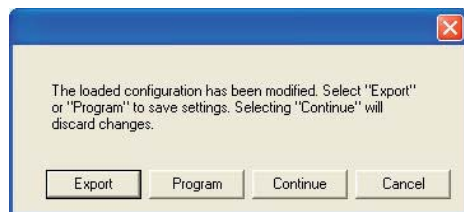
## Closing the ADLCONF Program

There are three ways to close the ADLCONF software:

- Click **Exit**
- Click the **X** at the top right corner
- Select *File / Exit*

Closing the ADLCONF software puts an attached radio back into data mode.

When you close the ADLCONF software after changing any setting without programming the change(s) to a radio, the following message appears:



- Click **Export** to write a configuration file to a selected location on your computer and close the ADLCONF software.
- Click **Program** to write the new configuration to the attached radio and then close the ADLCONF software.
- Click **Continue** to discard the changes and close the ADLCONF software.
- Click **Cancel** to return to the ADLCONF software without making any changes to the

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radio.

You must save changes before closing the program or you will lose them:

- You save the changes ***to a file on your computer*** by closing the ADLCONF software and then selecting the *Export* option or by selecting *File / Export*.
- You save the changes ***to a connected radio*** by closing the ADLCONF software and then selecting the *Program* option or by clicking the **Program** button.