

Technical Note 002:

Tony Thorne OEM Service Director ALLTRAX Inc.

### How to upgrade the Alltrax AXE and DCX Controller Software with USB Interface

August 01, 2006

## Overview

The Alltrax Motor controllers utilize a computer program to provide the motor drive functions, motor field current mapping, and a myriad of other customizable features such as speed, current, throttles, etc.

A majority of the Alltrax motor controllers also have the ability to be re-programmed with upgraded software. In most cases, it is not necessary to upgrade the unit's software for stock or aftermarket replacements unless a specific revision is needed for a particular application.

Upgrading the software is only allowed at authorized Distributors, Dealers, and OEM (Original Equipment Manufacturer). This technical note describes how to connect to the controller, download the upgrade program, and verify the units operation. **See Controller Pro Operators manual for more detailed operation.** 



WARNING: Using the wrong software will destroy the unit and render it non-operational and not covered by warranty.

### The Controllers:

The Alltrax controllers are segmented into families of products, the AXE, and DCX series allow for field upgrades, but the NPX and NCX series units are not field programmable. They must be sent to Alltrax customer service or an authorized repair facility such as D&D Motor systems, Nivel and HT Inter-coastal. [1]



The controllers discussed in this procedure have the 9pin RS232 field programmable communications port under the black cover port on the top cover. The programming package shown below assumes you purchased the recommended serial and USB adapter cable. The USB eliminates Com-Port issues with most computers. A 9-pin "straight pass through" cable is used with the recommended serial to USB adapter:

- Cables to Go, Port Authority™ 2 USB to Serial Adapter. <u>www.cablestogo.com</u>
- Radio Shack, 6 Ft. (1.8m) USB-to-Serial Port Cable, Model: 26-183, Catalog #: 26-183



# **Tools required:**

- A computer with Windows® 98, 2000, or XP.
- 9-Pin straight pass through serial cable and the 9-pin serial to USB adapter cable (or the 6' RS232-USB cable)
- Controller Pro Software (see
   <u>www.alltraxinc.com</u> and download
   <u>http://www.alltraxinc.com/old/Software/WEBControllerPRO.zip</u>
- 15 to 20volt DC wall adapter, 250 milliamp or more. Two alligator clips are needed
- Voltmeter

The wall transformer (sometimes called a wall-wart) provide power to the micro processor for programming.





# Connecting the Cables:

 Connecting power. The AXE and DCX have two basic versions of output control pins. Connect the power supply positive and negative wires as shown below. Be very careful the polarity is correct, damage to the controller can occur is connected improperly.





- 2. Before installing the USB cable into the computer, the USB adapter "driver CD" must be inserted and installed BEFORE plugging the cable into the computer. Follow the manufacturer's recommendations.
- 3. After the USB adapter drivers are installed, restart the computer to load the new USB drivers into the Windows® program.

Note: For RS232 users without USB – please see Controller Pro operators manual.

4. Connect the USB Serial adapter to the computer, Windows should find "New Hardware".



5. Connect the 9-pin serial adapter cable and USB adapter to the Alltrax controller:

### **Controller Program:**

Unzip and copy the Controller Pro program onto your desktop. This program is self contained and does not need to install any files. It will Unzip and run.

From your desktop, click on and start Controller Pro. The unit will talk with Controller Pro and load the default settings and display on the screen.

ettings Tools Help				
Control Panel   Throttle Res	ponse   1	Monitor		
Controller			Switches	
Model AXE 48	65P		F High Fedal Disable	
Serial # 39551			🖓 Plug Brake	Defaults
Field Map # 96			T Turbo	Refesh
			1/2 Speed Reverse	
Settings				
Max Output Current	30	5		
Under Voltage	15.0	Volte	1	
Over Voltage	60.0	Volta		j
Throttle Up Rate	4			
Throttle Down Rate	4			
Brake Current	20	2		
Tep Speed	100.0	2	Siow	Fest

From the Controller Pro screen, the settings can be adjusted using your "mouse over", dragging slider bars, or checking boxes. In the example shown above, the Plug Brake is checked.



#### Upgrading the Software:

After the unit is recognized by the software, select UPGRADE from the Tools Menu. In this example we are changing a DCX from a Field Map 4 to a Field Map 9.

ettings Tools Help					
Control Panel   Throttle Rea	ponee	Monitor	1		
Controller			Swee	2.es	
Model DCX 400			F High Pedal Disable		
Serial # 15366			F Plug Broke Defaults		
Field Map # 4			P	Turbo	Refrech
			R	1/2 Speed Reverse	
Settings					
Max Output Current	100	5		_	1
Under Voltage	16.0	Volts		1	
Over Votage	60.0	Vots			
Throttle Up Rate	5				
Throttle Down Rate	5				
Brake Current	65	4			
Top Speed	100.0	14	See	2	[ ] Fe

Select the "HEX" file located on your desk top (or other location that you saved the file that was provided by Alltrax). This is the program for the controller.

All and an other				10		
Control Parwi   Treadia Respon	ree   Meriler					
Consider Notel SOLASS		initiae 17 Higt Pedal C				
Seni # 15368	Open					2.2
Fett Nap 2 4	Link P	Deddos		• +	-	
Settrop Mex Datast Current Under Votege Over Votege		Hy Corpus His Network Street Web Sortunt to Sortunt to	Pares IEX Customents			
Trotte Up Faie Trotte Down Faie Breix Connt Top Speed	Ny Conserver					
Service St	Ne Natural	Ferrere	PL7_30P2			Queri
		Film of boar	(Hes Files ("Ass)			Cannel

The Upgrade will program the unit with the new Field Map program and show the controller is writing the program into flash memory:

AltTrax ControlPIID				-	
Control Panel   Thyottie Response	Monitor	48			
Controller Model DCX 450		Setches IT High Pedal	Disable	. Sec	
Setal # 1 AllTrax Co	IITrax ControllerPRO				
Field Map # 4 Writing Fl	,ASH m		Refmah		
Setings					
Max Output Cue Under Vollage	[	Cancel		_1	
Over Votage 60.0	Vota	_			
Throttle Up Rate 5		-	<u> </u>		
Throttle Down Rate 5		-	j		
Brake Current 65	4				
Top Speed 100.0	η.	Sew		Fas	

After the program is finished writing the memory locations, hit REFRESH to re-read the controller status. The field map now shows #9. The HEX file name used to up\grade the controller may have a different file number than the actual field map number. Don't confuse these two when programming. Contact Alltrax tech support is there are any questions.

nga Tanin Halp					
tool Panel   Throttie Res	ponse   1	Montor	4		
Controller			Satches		
Model DCX 400			F High Pedel Disable		
Senal # 15366 Field Map # 9			Pug Bake     Defaults     V Turbo     Refresh		
Settings					
Max Output Current	100	2	2		
Under Voltage	16.0	Vots	j		
Over Votage	60.0	Vota		i	
Throttle Up Rate	5				
Throttle Down Rate	5		j		
Brake Current	65	2			
Top Speed	100.0	4	Slow	-   Fai	

Technical Note 002:



### Conclusion

Programming the Alltrax Controllers allows the flexibility to change settings without re-shipping units around the world. However, improper settings, programming, or wiring connections can damage the unit, cause personal injury, or render the unit inoperable. It is imperative the programming be performed only by qualified and authorized personnel under the supervision of Alltrax Technical Services.

For more information contact Alltrax or the authorized distributors listed below.

## References

[1] Authorized Centers for Upgrade Programming:

- D&D Motor Systems: <u>http://www.ddmotorsystems.com</u>
- Nivel: <u>http://www.nivelparts.com</u>
  Intercoastal Manufacturing Co.
- http://www.imcgolf.com/index.html

### ALLTRAX Inc., Company History:

The company founder developed our core technology at the race track for high power electric vehicles. Throughout the 90's, the market demanded robust and high performance electronic controllers. In 2001 ALLTRAX was formed based on the E-race car developed technology.

Today, Power Conversion Engineering (PCE) is the research and development arm and ALLTRAX provides the industry a powerful and robust controller to meet all your recreational, industrial, and commercial electrical vehicle needs.

For more information please go to <a href="http://www.alltraxinc.com">http://www.alltraxinc.com</a>



"The company was founded at the track"