



DCX300-ET & DCX400-ET

***SEPARATELY EXCITED DC MOTOR CONROLLERS FOR THE ELEC-TRAK and
WHEELHORSE ELECTRIC GARDEN TRACTORS - ET's***

Controller Use

The ET version of the DCX controllers have been modified from the original DCX designed for golf car use. The ET version has a lower Field current and a different Field Map installed in the software than the golf car controller, therefore it will not work in golf cars nor will the golf car version work in the Elec-Trak and WheelHorse electric garden tractors. Installation of the ET version into a golf car or installation of the golf car version into a ET will void the warranty.

Limited Warranty

Alltrax, Inc. warrants this motor controller to be free from defects in materials and workmanship for a period of 2 years from the date of manufacture. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations. We shall in no event be liable for death, injuries to persons or property or for incidental, contingent or consequential damages arising through the use of our products. Alltrax, Inc. specifically disclaims the implied warranties of merchantability and fitness for a particular purpose, however some areas do not allow limitations on how long an implied warranty lasts, so the preceding exclusion may not apply to you. This is Alltrax, Inc. sole written warranty, no other warranty is expressed or implied. In the event you need warranty repair, please call Alltrax to obtain a return authorization number. Alltrax reserves the right to repair or replace merchandise at its option, and to make changes to any of its products or specifications without notice.

Safety

Disconnect and remove the front batteries then disconnect the rear battery pack **BEFORE** beginning work on the Electric Tractor (ET). Use insulated wrenches when working on batteries connections and follow the battery manufactures recommendations for safe battery installation/removal.

Installation

Remove all relays, contactors, control boards, ribbon resistors and associated wiring from the Electric Tractor (ET). Mount the controller, face up on the back of the metal plate that separates the battery area from the steering gear area, the top of the controller should face toward the driver. Position the controller to the left of the steering shaft with it's face approx. 1 1/2 inches higher than the plate. Drill two holes thru the controller mounting flange and plate near the top of the plate. Match drill two holes thru the plate for the bottom set of holes on the controller. Mount one of the removed contactors on top of the controller using 1/4 -20 bolts 3/4 inches long screwing them into the plastic nuts in the case. Orient the contactor so it does not interfere with the black plastic plug that covers the serial port connector under the case. Using the wiring diagram provided with your controller wire the high current connections first, connecting the motor and batteries to the controller. Make sure you connect the B- terminal thru the **Current Shunt** and not directly to the battery otherwise your Power Meter won't work.

Connect the motor leads as shown making sure that you connect the B+ power lead from the contactor and the A1 motor lead at the B+ terminal of the controller. This is important for proper controller operation. Connect the S2 terminal of the motor to the M-terminal of the controller. Make all of the high current leads as short as practical. If you want to use the Thermal Breaker mounted on the out side of the motor wire it in the M- to motor S2 lead. Connect the field winding to the F1 and F2 spade lugs on the controller. We suggest you replace the crimp lugs on the motor connections, especially the field terminals, because they see extreme conditions and may not be making good contact.

Use 18 AWG stranded wire for connector and run wires per the wiring diagram for the switches, Main contactor and backup horn. Bring all these wires (6 total) close to the face plate of the controller leaving enough slack to work comfortably. Also bring the two wires for the throttle to the same area. The connector for the control pins is installed so the wires exit upwards on the face plate. The connector is keyed so it cannot be plugged in wrong. Push the wires into their corresponding pins on the connector using a small screw driver. Slide the white cover over the wire connections when all wires have been tested for continuity. *The connector is designed to cut thru the insulation making contact with the wire. Make sure they are pressed all the way down.*

Pins 9 & 10 go thru the 1 ohm 10 watt resistor and pin 10 has a 3A, 100V diode as shown. It keeps the controller caps from discharging back into the controls and the ET. If you do not use the manual disconnect switch that came with your ET install the optional switch shown to allow the battery charger and pins 9 & 10 to be switched on and off. *The battery charger should not be connected when the controller is connected.* High charger voltages may exceed the ratings of the internal components of the controller and cause them to be damaged. **Make sure you dress all the wiring to ensure that the wires do not get chewed up in the steering gears. Recheck all your wiring with a meter to make sure they are connected properly, errors could cause a fire.**

Reinstall the batteries observing the battery manufactures safety procedures.

The throttle pot installation is dependent upon which model ET you have and how the user wants it to function. Therefore we have made no effort to describe it's installation.

It must be installed so the pot provides approximately 0 – 5K ohms resistance to controller pins 1 & 2, if the 0 – 5K throttle option is being used. The Throttle Switch must open when the throttle reaches the off position. Off is 250 ohms or less, full throttle is 4.5K ohms and more. Open Throttle Shutdown occurs at 9K and above. This shuts down the controller if a throttle wire breaks.

Control Pins Description

Pins 1 & 2 - Throttle Inputs.

Pin 3 - Horn driver capable of sinking 50ma max. Install a driver such as a relay or power transistor if you need more output power for backup lights etc.

Pin 4 - Reverse input. Applying B+ to this pin causes the controller to reverse the field current.

Pin 5 - Throttle Switch input. B+ is applied to this input when the throttle is depressed causing the contactor to close.

Pin 6 - Key Switch input. B+ is applied when the key is on, this makes the controller go Ready. When Key Switch is off and pin 9 is at B+, Roll Detect is enabled.

Pin 7 - Contactor Driver capable of sinking 2A max. This pin pulls one side of the contactor to ground.

Pin 8 - Not Used

Pin 9 - Provides B+ power for Roll Detect logic.

Pin 10 - Provides B+ power to precharge controller caps

Operation

Turn on the Manual Disconnect switch if retained or move the Chrg/Storage – Run switch to the Run position. In the Chrg/Storage position the switch allows you to disconnect all power to the controller when the ET is not being used or when charging the batteries. In the Run position it provides power to the controller to precharge the caps and for the Roll Detect feature to operate.

Turn on the Key Switch and the ET is now operational.

Apply the throttle and the ET will go forward if the REV switch is off. Reverse is activated by turning on the Rev switch on.

The Rev switch may be turned on at any speed and the ET will ramp down and then back up in the reverse direction.

Turning off the Key Switch causes the Roll Detect logic to be activated. If the Key switch is turned off while moving the ET will go into a regen braking mode.

The Seat switch is in series with the Key switch so if it opens it also causes the ET to go into regen braking. This is a safety feature and stops the ET if the Operator falls off.

The PTO switch is in series with the Key and Seat switches, this causes the PTO to be turned off if either of these are opened.

The Brake switch causes regen braking to be activated, if the switch is adjusted so it opens before the mechanical brakes are applied it causes regen braking to do most of the braking.

Troubleshooting:

At power up, the front panel LED on the controller will blink green a number of times. The number of green blinks identifies the throttle configuration of the controller. If there is an error, the LED will then blink a RED pattern.

Green Blinks = Throttle Type

- 1 green = 0-5K 2 wire throttle
- 2 green = 5K-0 2 wire throttle
- 4 green = E-Z-GO ITS compatible throttle

Red Blinks = Error Code

- 1 red = Throttle position sensor over range. Check for open throttle wires.
- 2 red = Under temperature. Controller shuts down at temps below -25C.
- 3 red = HPD. Throttle has not returned to zero during this power up sequence.
- 4 red = Over temperature. Controller shuts down at temps greater than 95C.
- 6 red = Battery undervoltage shutdown. Battery V < undervoltage slider.
- 7 red = Battery overvoltage shutdown. Battery V > overvoltage slider.

Solid Green = OK and ready

Solid yellow = throttle wide open and controller not in current limit

Solid RED = controller in bootload mode

This controller may be programmed to change operating characteristics such as throttle response rate, throttle type, top speed and braking force. Go to our web site and download the free software tool ControllerPRO. With a DB-9 serial cable and a notebook PC running Windows XP, you can customize the driving style of the car on the fly.

Thank you for buying our product. We are sure you will appreciate the features and performance built into our controllers. If you have any problems or questions please call or e-mail us.

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