



www.alltraxinc.com

Operators Manual XCT & NCT



Alltrax Inc

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WARNINGS



GENERAL WARNINGS

Safety Notes:

When working on electric vehicles, sudden unexpected events can occur, it's recommended to:

- Place the drive axle on jack stands—wheels off the floor.
- When working on wiring or batteries, always remove rings, watches and secure dangling clothing/hair/jewelry.
- Use the proper safety equipment, eye protection, and insulated tools.
- Never connect a computer while the vehicle is being charged.
- Disconnect batteries before installing or working on the Alltrax controller.
- Wear safety glasses.
- Because hydrogen can build up due to gassing from the batteries, work in a well ventilated area.
- Make sure the battery pack is fused.
- Do not clean the controller with a high PSI pressure washer.
- When cleaning batteries, take precautions to keep the battery acid from splashing on the controller.

CAUTION:

It is the installer's responsibility to ensure the correct equipment (i.e. wire, motor, solenoid, fuse etc) is installed in the vehicle. Equipment should be sized correctly for planned usage. Failure to do so could pose a significant risk of explosion, fire, property damage and serious injury or death.

READ AND SAVE THESE INSTRUCTIONS

WARNINGS



FIELD MAPS

Alltrax XCT performance controllers have programming that is specific to the motor they are being paired with known as a field map (controls power). It's crucial that the field map be correct to keep the motor from over-heating while providing the best possible performance. The controllers generally come programmed for the stock motor unless otherwise specified. If you are unsure if you have the proper field map or are changing motors. Please contact Alltrax technical support.



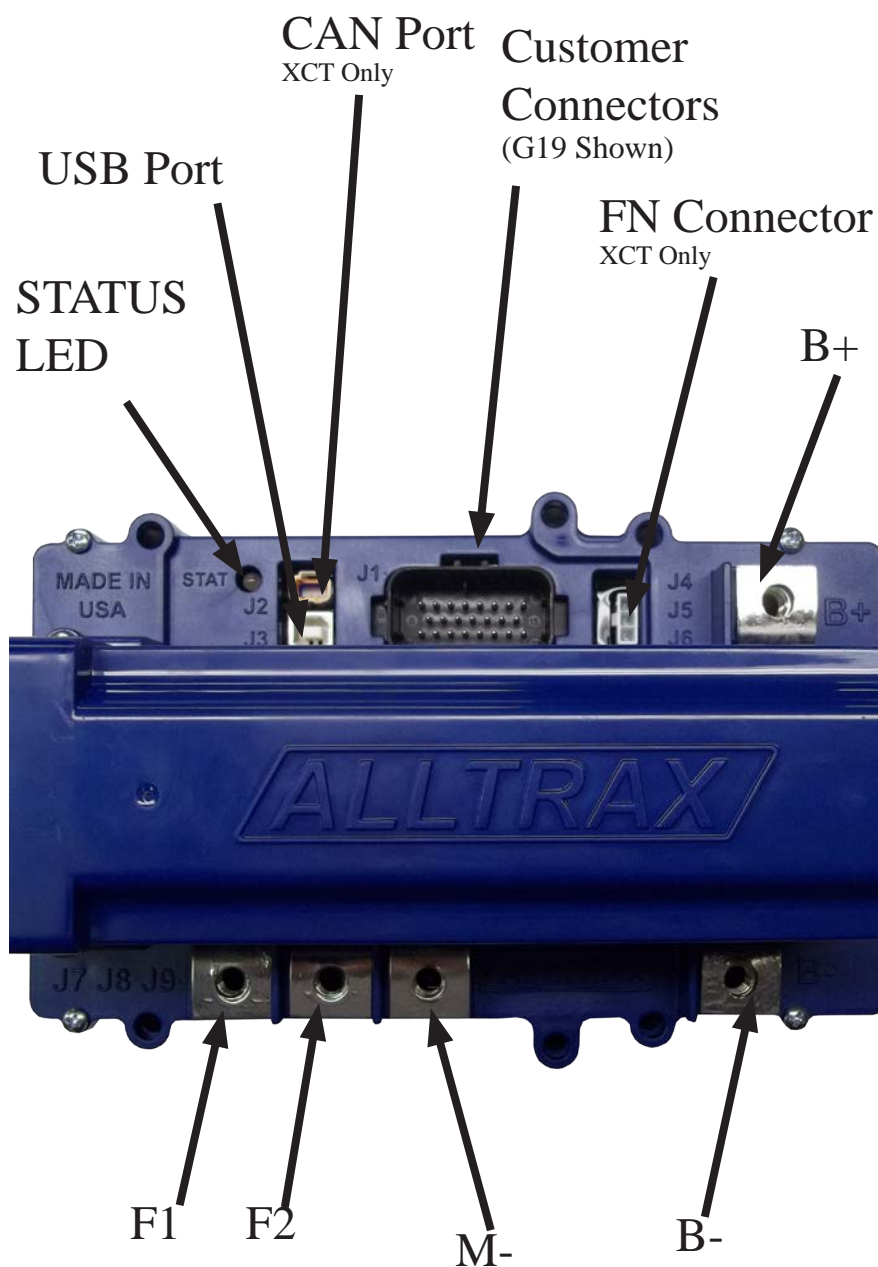
USABILITY STATEMENT

Alltrax Inc's lines of Series and Shunt Motor Controllers are intended for use with motors only. Any application or usage that does not meet these criteria WILL NOT be covered by warranty. Also, any requests for design assistance or technical support outside the scope of the product intended use may be denied. Alltrax assumes no liability for any damage or injury as a result of use of the motor controllers in a non-traction or process motor application. See the warranty at the end of this manual.

WARNING: Use of this product for other than these specified uses may be highly dangerous and lead to serious injuries or death.

WARNING: The use of this product for the production of Plasma Assisted Hydrogen, Brown's Gas, HHO (H₂O Hydrogen Electrolysis) or any other type of gas is prohibited. Generation and storage of these gasses is extremely dangerous and poses a significant risk of explosion, fire, property damage and serious injury or death.

XCT/NCT LAYOUT



XCT/NCT SPECIFICATIONS

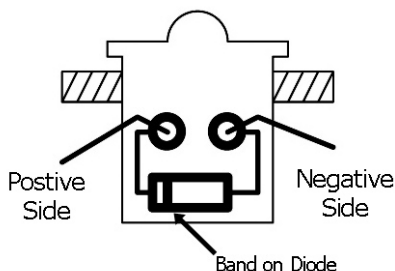


Model	2 Min (Amps)	5 Min (Amps)	Continuous (Amps)
NCT48275	275	175	125
XCT48300	300	200	125
XCT48400	400	250	140
XCT48500	500	400	250

Type:	Shunt Motor Controller
Operating Frequency:	18kHz
Controller Voltage, KSI & Reverse:	NCT48xxx: 24-48C nom, 62V max XCT48xxx: 24-48V nom, 62V max
Operating Temperature:	-20°C to 85°C, shutdown @ 95°C
Environmental Operating Temperature:	-20°C to 50°C
Standby Current (Power up):	<1W nom, <8W Fan on
KSI & Rev Pin Input Current:	<20mA
Relay Drive Current:	5A peak, 1A Cont.
Throttles Supported:	0-5k, 5k-0, E-Z-GO ITS, Club Cart 5k-0 3 Wire (MCOR), 0-5v, USB Throttle, Absolute Mode
Terminal Bolt Torque:	Torque bolts to 60-80 in.lb (5-7ft.lb, 6.77-9.4nm)
Mounting Bolt Torque:	Torque bolts to 15-20 in.lb (1.25- 1.75 ft.lb, 1.7-2.25nm)

INSTALLATION

Diode Mounting



The diode across the coil terminals safely dissipates the energy when the coil is turned off. Installation Dependant, refer to applicable drawing.



Contactor Size	Diode	Diode Current
70A-200A Solenoid	1N4004	1A
400A-550A Solenoid	1N5408	3A
600A or larger Solenoid	MR754	6A

Pre-Charge Resistor Mounting

The XCT/NCT Controller DOES NOT need a Pre-Charge Resistor installed on the solenoid. The controller handles pre-charge internally through the Tow/Run switch.

Contactors (Solenoids)



The solenoid is the primary disconnect of the battery pack in the case of the an emergency. In order to be effective, the solenoid needs to be properly rated for the current that will be drawn from the batteries. It is VERY important that the solenoid be rated correctly. It is the only way to disconnect the batteries from the motor/controller loop in case of a failure. Too small of a solenoid increases the likelihood that the contacts will weld together and not be able open.

When installing a new controller, Alltrax recommends the OEM solenoids be replaced with a heavy duty version. See below for suggested sizing of solenoid replacements.

As a regular part of a preventative maintenance plan, solenoids should be replaced every 3-5 years.

STANDARD DUTY

Flat lands with moderate speed and torque performance expectations.



OEM Stock 100 AMP

Use with 300A controllers.
(Consider upgrading to a heavy
duty 200A solenoid with Alltrax
Controllers)

HEAVY DUTY

High performance, high speed, maximum torque, pulling loads, hilly terrain or Hunting Buggies.



Performance 200 AMP
(600amp Inrush)
Use with 300A and 400A
Controllers
Suggested types:
SW180
W&R 586 (Shown)



Heavy Duty 200 AMP
(800A Inrush)
Use with 300A to 500A
Controllers
Suggested types:
MZJ200 (Shown)



Heavy Duty 400 AMP
(1000A Inrush)
Use with 500A Controllers
Suggested types:
SW200
MZJ400 (Shown)

Fuse

Any application where there is a battery pack, a fuse must be installed. A fuse will open the battery circuit and prevent any serious damage from occurring.

The fuse should be installed on or between the battery terminals. The main battery positive OR main battery negative OR in-between 2 batteries is an acceptable location for fuse installation. The fuse must be rated for pack voltage and fault current.



Controller Amperage	Fuse Style / Rating
400A or less	ANN / 250A
450A or more	ANN / 400A

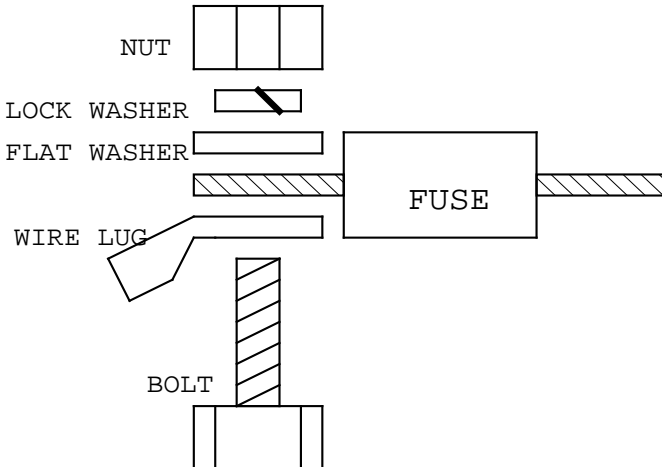


Diagram: Fuse terminal hardware

Wiring

Wiring and battery health in an electric vehicle are very important and overlooked during performance upgrades. Wiring size is important for safety and proper operation of the vehicle. Undersized wires will affect the performance of controllers and can overheat. Wires should be crimped with proper sized terminals and tools to provide a clean low resistance connection.

Controller	Min. Wire AWG Standard Duty	Min. Wire AWG Heavy Duty
200/300A	OEM -6 AWG	4 AWG
400A	4 AWG	2 AWG
500A	2 AWG	1/0 AWG

Power Wiring

When running wiring for the vehicle care must be taken for proper wire routing. Power wiring should be of proper sizing and ran as low in the framework of the vehicle as practical. Lengths of power wire runs need to be kept short and pairs of wires from common circuits should be grouped together to reduce EMC emissions. Secure all power wiring to the vehicle framework.

Signal Wiring

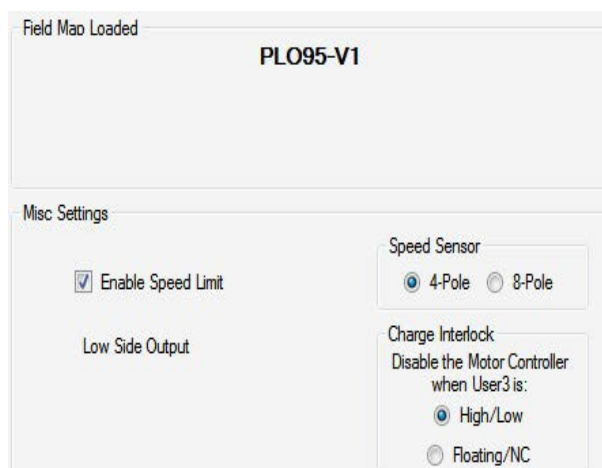
Signal wires should be keep as short as practical. Care should be taken to protect the wires sharp edges and rubbing. Consider the use of split loom or braided wire sheathing. Fasten bundles securely to framework. Do not route the signal wires together in the same bundle with power wires.

Speed Sensor Information

The speed sensor is a small group of wires attached the end of the motor. Using a 4 or 8 pole magnet bolted to the armature, it measures the RPM of the motor.



The majority of separately excited motors will come with a speed sensor on them, the E-Z-Go DCS and old Club Car “Regen 1/2” carts are the exception. All XCT controllers are programmed to look for the speed sensor on the motor but can be programmed to ignore it like our old DCX line.



You can disable/enable the speed sensor using the Alltrax Toolkit. In the ‘Controller Settings’ tab you will find an ‘Enable Speed Limit’ check box. If checked the controller looks for a signal from the speed sensor.

Common Problems:

Cart takes off strong but levels out at a very slow speed.

Speed sensor could be missing or broken. Try disabling, if it corrects the problem replace the speed sensor or magnet.

Jerking response/rough feeling throttle.

Could be speed sensor related, try disabling, if the problem ceases - change your speed sensor and magnet.

The cart feels like it is travelling half speed but the monitor shows full RPM.

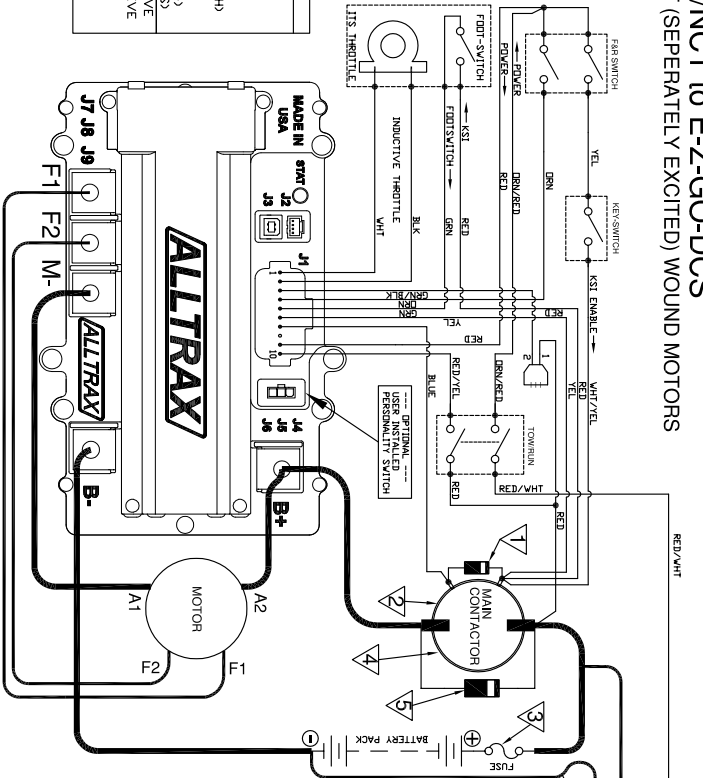
Try selecting a different pole count. (if 4 is selected try 8)

VEHICLE INSTALLATION DRAWINGS

Don't see a drawing that suites your needs?
Visit our website for full sized, updated and more drawings.
www.alltraxinc.com

E-Z-GO DCS

XCT/NCT to E-Z-GO-DCS FOR SHUNT (SEPERATELY EXCITED) WOUND MOTORS



UNIT	FUNCTION
1	THREATLE
2	THREATLE
3	REAR REE
4	REAR REE
5	FLEET SWITCH
6	KSI (KEY SWITCH)
7	SOL-ENDED COIL
8	NOT-USED
9	LOGIC POWER (4)
10	LOGIC POWER (4)
11	BATTERY POSITIVE
12	BATTERY POSITIVE
13	BATTERY MINUS
14	BATTERY NEGATIVE
15	BATTERY NEGATIVE
16	BATTERY NEGATIVE
17	MOTOR FIELD
18	MOTOR FIELD
19	MOTOR FIELD
20	MOTOR FIELD

NOTES:

- ▶ FLUIDS REQUIRED FOR ALL INSTALLATIONS
- ▶ NONE REQUIRED ACROSS COILS / RELAYS
- ▶ TON/RAIN SWITCH PREVENTS REGEN WHILE TONING
- ▶ ASSUMES FROST/SLUSH IS OPEN WHEN THIRDTILE DEF
- ▶ ALLTAX RESERVES THE RIGHT TO CHANGE DOCUMENTATION WITHOUT NOTICE
- ▶ ALLTAX MAKES NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY, OR SUITABILITY OF ANY TECHNICAL, OR OTHER INFORMATION PROVIDED
- ▶ SEE OPERATORS MANUAL FOR MORE INFORMATION

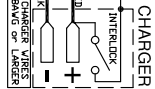
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PART NO.	DOC110-014



1	
DIODE RATING	CONTACTOR RATING
IN4001	DEM
IN5408	200A
MR754	400A

CONTRACTOR RATING	CONTROLLER RATING
DEM	300A
200A	DR 400A
400A	TD 500A

3	
FUSE	CONTROLLER RATING
ANN250	400A DR LESS
ANN400	450A DR MORE

- | | |
|---|---|
| 4 | PRE-CHARGE RESISTOR NOT
NEEDED ON XCT UNITS |
| 5 | REGEN DIODE REQUIRED
USE:
ALLTRAX P/N KIT-EZ-DIODE
OR
6A6 DIODE (6A 660V) |

POWER WIRE RATING	CONTROLLER RATING
6AWG-4AWG	300A
4AWG-2AWG	400A
2AWG-1/0AWG	500A

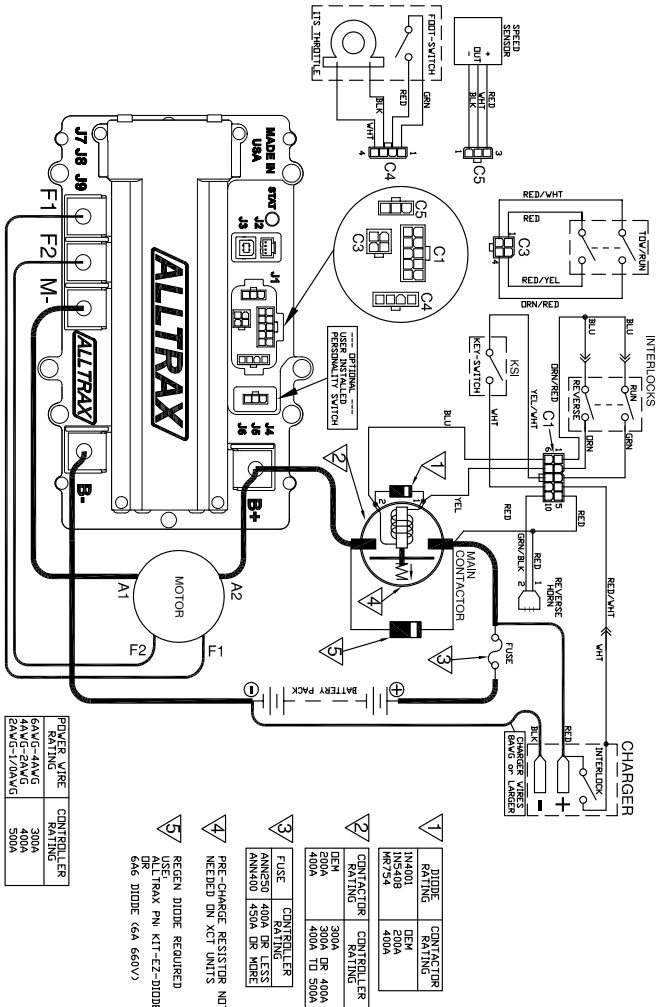
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PHONE: (541) 476-3565

FILE:	XCT to E-Z-GO DCS Wiring Diagram		REV.
SIZE	DOCUMENT NO.		
A	S DOC110-014		E
_DWG-XCT-EZGO-DCS-wiring-diagram			SHEET 1 of 1

E-Z-GO PDS

XCT/NCT to E-Z-GO-PDS FOR SHUNT (SEPERATELY EXCITED) WOUND MOTORS

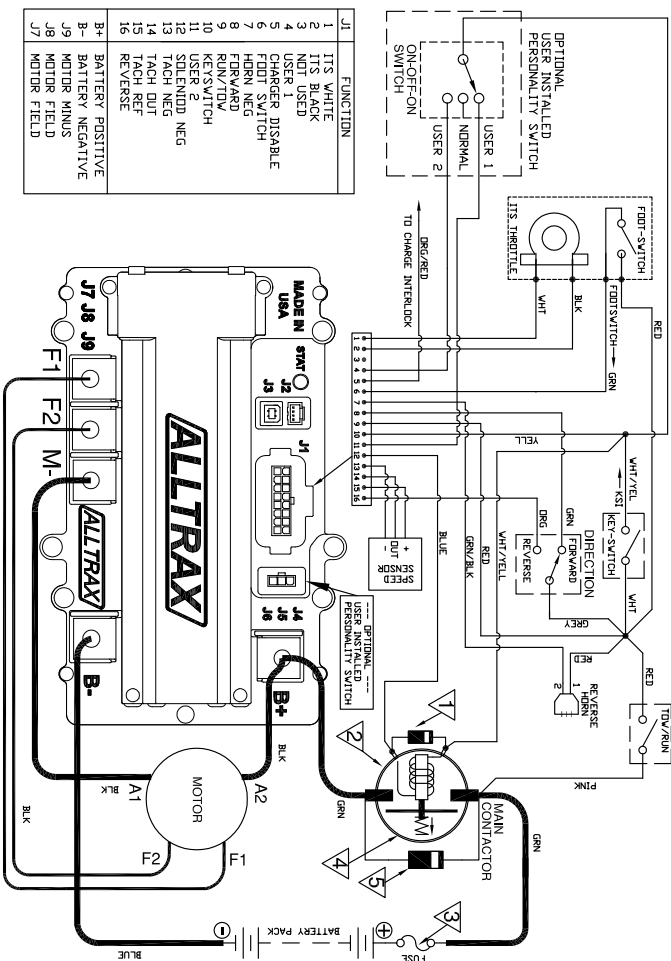


- NOTES**
- > FLUSES REQUIRED FOR ALL INSTALLATIONS
 - > DIMMER REQUIRED ACROSS COILS / DELAYS
 - > TOW/ RUN SWITCH PREVENTS REGEN WHILE TOWING
 - > ASSUMES FROST/ SWITCH IS OPEN WHEN THROTTLE OFF
 - > ALL TRAXX RESERVES THE RIGHT TO CHANGE DOCUMENTATION WITHOUT NOTICE
 - > THERE IS NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL, OR OTHER INFORMATION PROVIDED
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SIZE DOCUMENT NO.		REV	
A	S DDC110-015	1 of 1	
FILE: \\PWC-CCT-ESD-005-444-00-049		SHEET	

E-Z-GO TXT 48

XCT/NCT to EZGO TXT 48 FOR SHUNT (SEPARATELY EXCITED) WOUND MOTORS



- 1 DIODE CONTACTOR
1N4001
1N4008
1N5408
400A
- 2 CONTACTOR
300A OR 400A
200A
400A TO 500A
- 3 FUSE
ANN250 400A OR LESS
ANN400 450A OR MORE
- 4 PRE-CHARGE RESISTOR NOT
NEEDED ON XCT UNITS
- 5 REGEN DIODE REQUIRED
USE:
ALLTRAX PN KIT-EZ-DIODE-T
OR
6A6 DIODE (6A 650V)

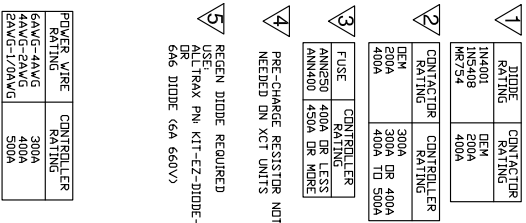
POWER WIRE	CONTROLLER
44WG-44WG	300A
44WG-24WG	400A
24WG-1/0AWG	500A

NOTES:

- > ALL PARTS REQUIRED FOR ALL INSTALLATIONS
- > DIODE REQUIRED ABOVE TACH / RELAYS
- > TACH/RELAY SWITCH PREVENTS REGEN WHILE TYPING
- > ASSURES DIODE SWITCH IS OPEN WHEN IMMEDIATE REGEN
- > ALLTRAX RESISTS THE RISK TO CHARGE DISCREPANCY
- > WITHOUT NOTICE
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<p>Wiring Diagram</p>				<p>XCT to E-Z-GO TXT-48</p>			
<p>SIZE DOCUMENT NO.</p>				<p>DOC110-016</p>			
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PART NO.	DOC110-018
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- FUSES REQUIRED FOR ALL INSTALLATIONS
- DIODE REQUIRED ACROSS COILS / RELAYS
- TOW/RAIN SWITCH PREVENTS REGEN WHILE TOWING
- ASSURES FLOWSWITCH IS OPEN WHEN THROTTLE OFF
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J1	FUNCTION
1	THROTTLE HIGH
2	THROTTLE WIPER
3	THROTTLE LOW
4	USER 1
5	CHARGER DISABLE
6	FDDI SWITCH
7	HORN NEG
8	IGNARND
9	REARWARD
10	KEYSWITCH
11	USER 2
12	SOLENOID NEG
13	TACH NEG
14	TACH OUT
15	TACH REF
16	REVERSE
B+	BATTERY POSITIVE
B-	BATTERY NEGATIVE
J9	MOTOR MINUS
J8	MOTOR FIELD
J7	MOTOR FIELD

REVISIONS	

WG SCALE:	NTS
WIN	111111

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TITLE
XCT to CLUB CAR IQ/i2/EXCELL

winning diagram		
SIZE	DOCUMENT NO.	REEL
A	S DOC110-018	G
FILE: _DMS-XCT-CLUBCAR-Q-MNE-DA.DMG		
SHEET		1 of 1

**XCT/NCT to YAMAHA G19 & G22 W/ GE CONTROLLERS
FOR SHUNT (SEPERATELY EXCITED) WOUND MOTORS**

PART NO.	DOC110-020
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- | | | |
|---|---|------------------------------|
| 1 | DIODE
RATING | CONTRACTOR
RATING |
| | IN4001
IN5408
MR754 | DEM
200A
400A |
| 2 | CONTRACTOR
RATING | CONTROLLER
RATING |
| | DEM
300A
400A | 300A DR 400A
400A TD 500A |
| 3 | FUSE | CONTROLLER
RATING |
| | ANNE20
ANNE30
ANNE40 | 400A DR LESS
450A DR MORE |
| 4 | PRE-CHARGE RESISTOR NO
NEEDED ON XCT UNITS | |

NOTES

■ FUSES REQUIRED FOR ALL INSTALLATIONS
■ TIME DELAYED ACROSS CMT'S / DELAYS

- ▶ TOW/ON SWITCH PREVENTS REGEN WHILE TOWING
- ▶ ASSUMES FDS/TSWITCH IS OPEN WHEN THROTTLE OFF
- ▶ ALLTRAX RESERVES THE RIGHT TO CHANGE DOCUMENTATION WITHOUT NOTICE
- ▶ ALLTRAX MAKES NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY, OR SUITABILITY OF ANY TECHNICAL, OR OTHER INFORMATION PROVIDED
- ▶ SEE OPERATOR'S MANUAL FOR MORE INFORMATION

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**XCT/NCT to YAMAHA G22 W/ MORIC CONTROLLERS
FOR SHUNT (SEPERATELY EXCITED) WOUND MOTORS**

PART NO.	DOC110-047-A



- ## NOTES

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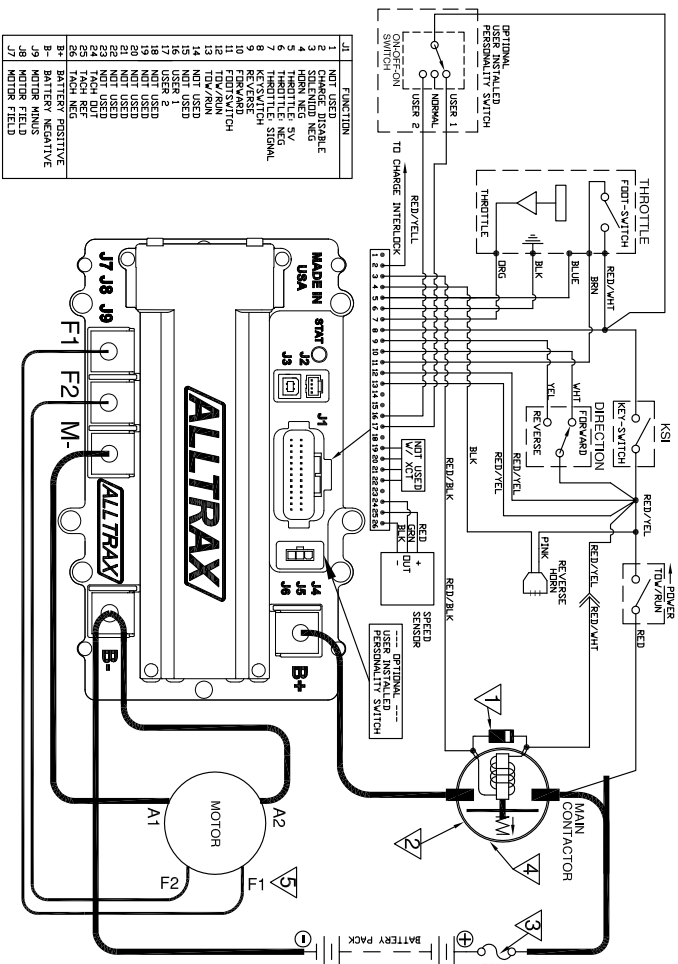
THIS VEHICLE IS A HIGH SIDE
DRIVE. OBSERVE POLARITY OF B+
AND B-.

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YAMAHA YDRE

**XCT/NCT to YAMAHA YDRE
FOR SHUNT (SEPERATELY EXCITED) WOUND MOTORS**



DIODE RATING	CONTACTOR RATING
1N4001	DEM
1N5408	200A
MR754	400A

FUSE	CONTROLLER RATING
ANN250	400A DR LESS
ANN400	450A DR MORE

PRE-CHARGE RESISTOR NOT
NEEDED ON XCT UNITS

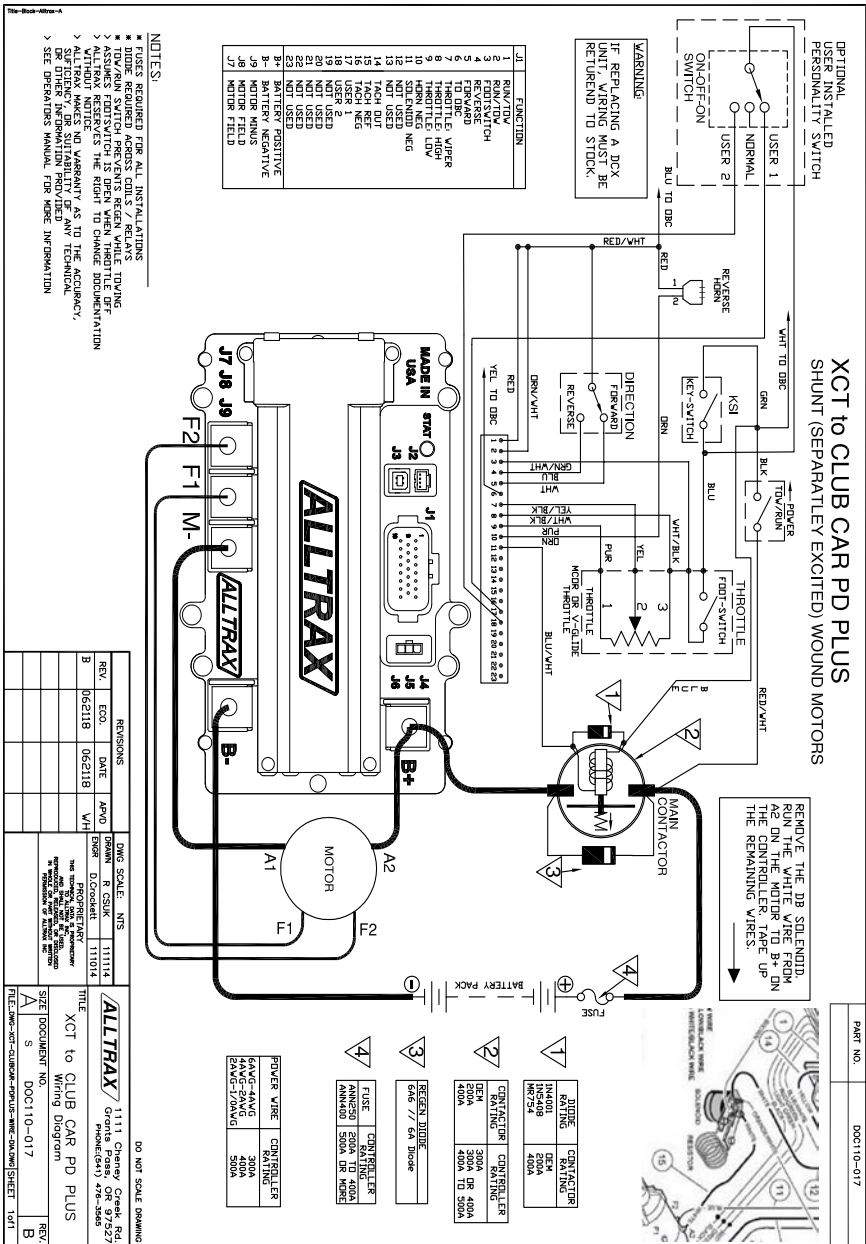
POWER WIRE RATING	CONTROLLER RATING
6AWG-4AWG	300A
4AWG-2AWG	400A
2AWG-1/0AWG	500A

- NOTES:**
- FUSES REQUIRED FOR ALL INSTALLATIONS
 - DUIDE REQUIRED FOR ACCESS COILS / BELAYS
 - TDV/RUN SWITCH PREVENTS REGEN WHILE TOWING
 - ASSUMES FDS/STOPS IS OPEN WHEN THROTTLE OFF
 - ALL RALMA RECEIVES THE RIGHT TO CHANGE DOCUMENTATION
 - ALL RALMA DUIDE
 - ALL RALMA MAY VARY AS TO THE ACCURACY, SUFFICIENCY, OR SUITABILITY OF ANY TECHNICAL, OR OTHER INFORMATION PROVIDED
 - SEE OPERATORS MANUAL FOR MORE INFORMATION

THIS VEHICLE IS A HIGH
SIDE DRIVE. OBSERVE
POLARITY OF B+ AND B-

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REV.	ECO. DATE	AMOD	
F	08/31/77	08/31/77	
		WH	
PROJECT: 11111 PROJECT NAME: 11111 PROJECT NO.: 11111 PROJECT DATE: 11/11/77 PROJECT LOCATION: 11111 PROJECT DESCRIPTION: 11111 PROJECT STATUS: 11111 PROJECT COMMENTS: 11111			TITLE
XCT to YAMAHYA YDRE Wiring Diagram			
SIZE DOCUMENT NO.		REV	
A S DOC110-021		F	
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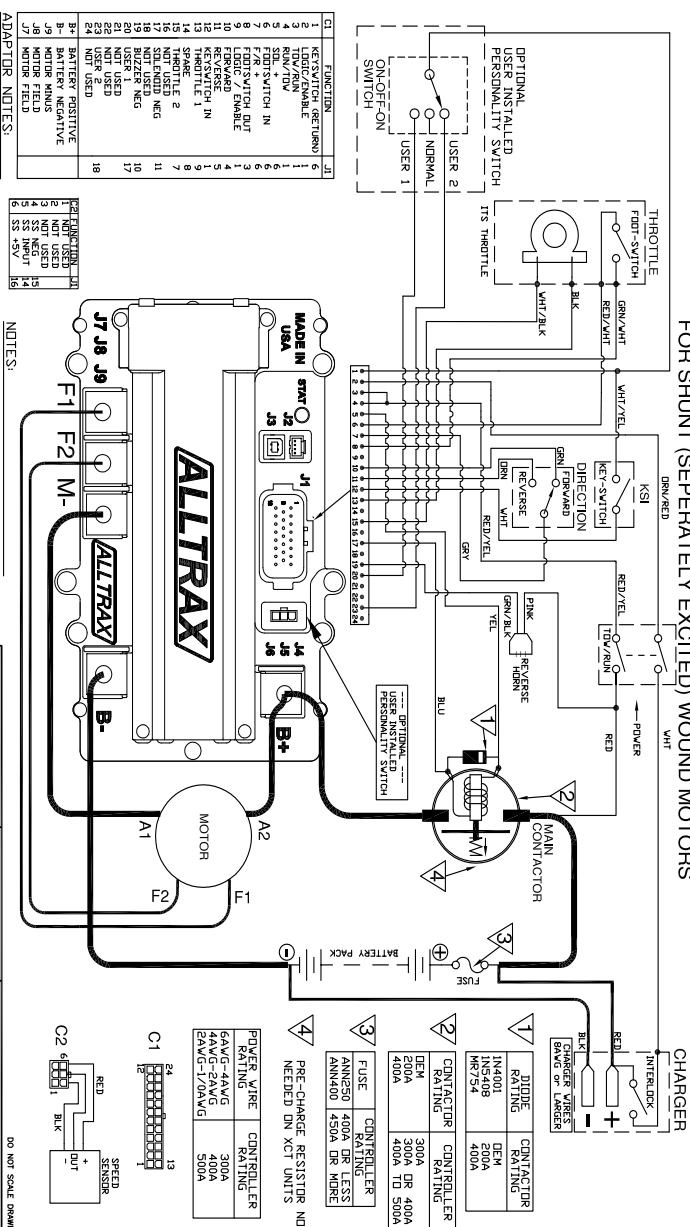
XCT to CLUB CAR PD PLUS



XCT TO EZGO WITH 1264 or 1268

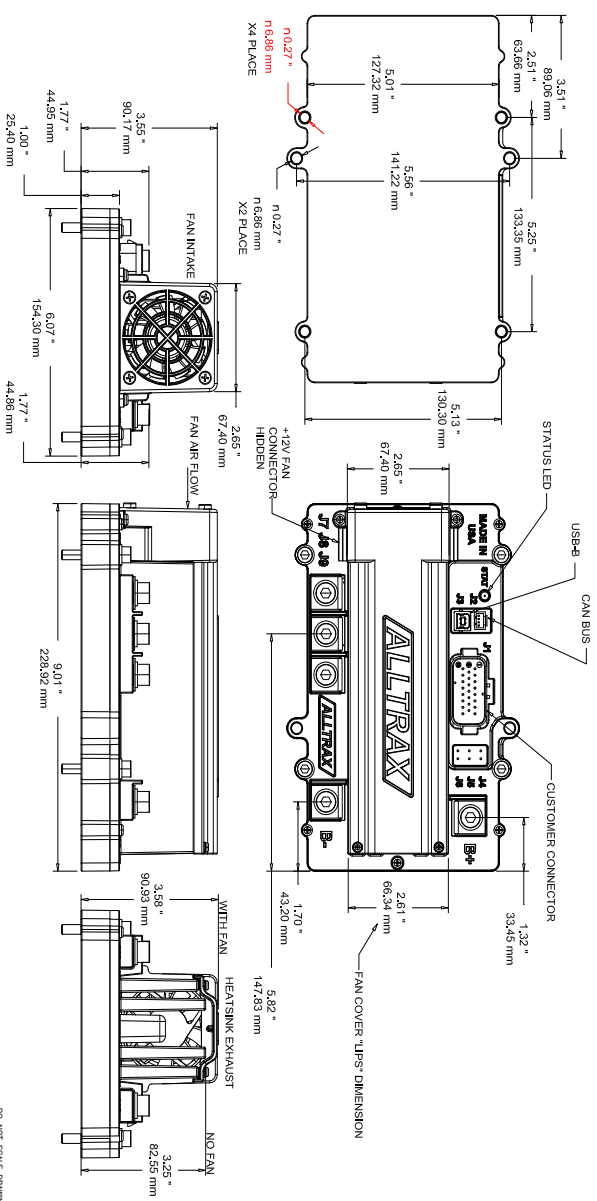
XCT/NCT 1268/1264 EZGO FOR SHUNT (SEPARATELY EXCITED) WOUND MOTORS

PART NO. 000110-050



CONTROLLER DIMENSIONS

CONTROLLER DIMENSIONS



DIMENSIONS:
US INCHES
[METRIC]

REVISIONS				DWG SCALE: NTS			
REV.	ECO.	DATE	APPRO	DRAWN	R. CHECK	INCH	D. CHECKED
A		12/08/14	02/16/15	RC		11/18/14	
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				TITLE: XCT & SR CONTROLLER DIMENSIONS			
				SIZE: DOCUMENT NO. 00C110-035			
				FILE: D:\WP-XCT-SR-CONTROLLER-DIMENSION\ SHEET 1 OF 1			

PART NO.	00C110-035
	4/17/2008

UNIVERSAL ADAPTER MOUNT

(OPTIONAL)

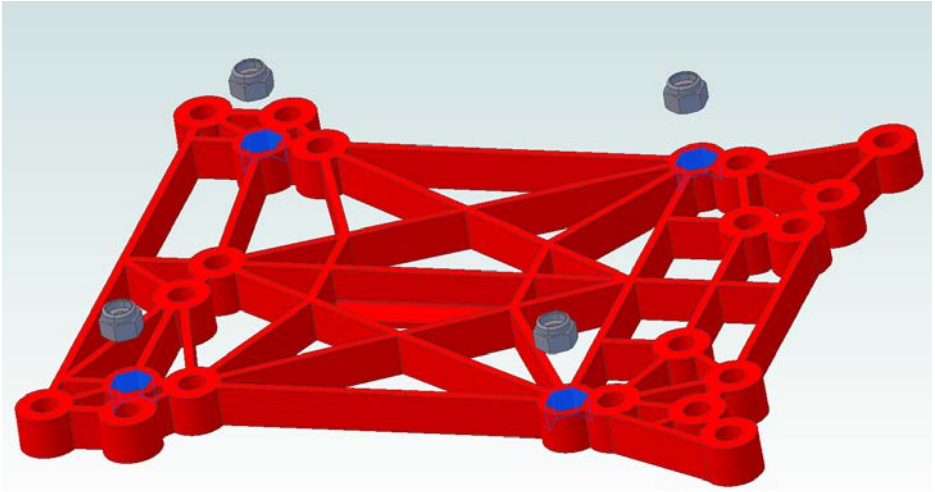
The XCT Family of controllers offers a Universal Mounting system to allow for faster installation of Alltrax Controllers. Using the original mounting holes, the adapter plate bolts to the cart and the controller to the plate.

Each mounting kit is specific to a make/year of golf cart. Check with your dealer to get the correct kit for your application.

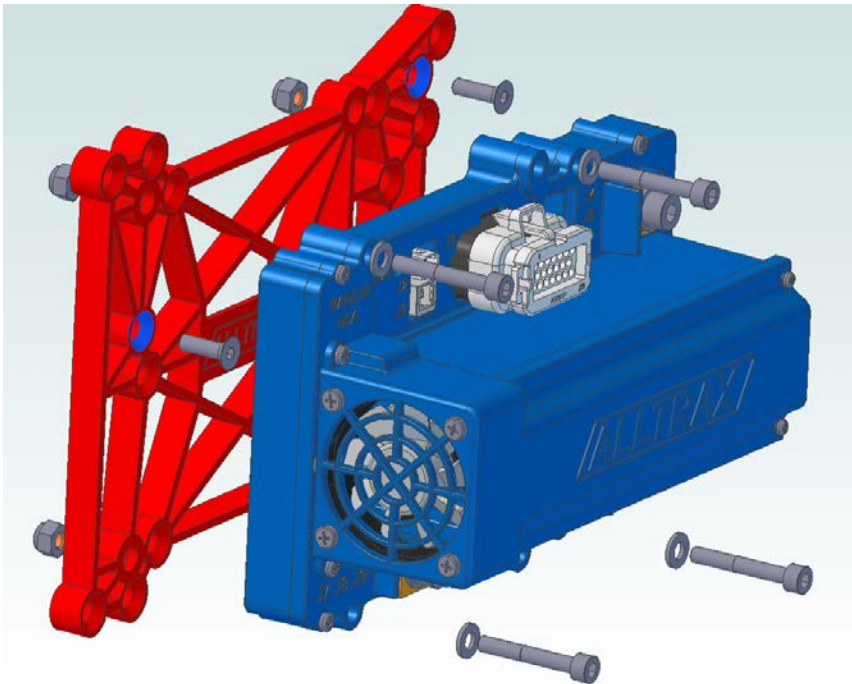
Instructions are provided with the kit. The instructions below are for provided for convenience and may not reflect your mounting kit.

GENERAL INSTALLATION INSTRUCTIONS

1. Insert the 4 HEX NUTS (1/4-20 nuts) into the adapter at the locations as shown (Fig 1) The nuts are on the back side of the mounting adapter plate. The Nyloc plastic faces out, press them flush with the surface.
2. Follow the directions included with the UAM.
-- Alternatively, place adapter plate against the mounting plate and visually locate the appropriate mounting holes and note which holes on the adapter to use.
3. Place the adapter plate onto the golf cart controller with the ALLTRAX Logo on mounting plate facing you with the 4x NUTS against the carts mounting plate.
4. Install and tighten the supplied flat head screws into the locations identified in Step 2. DO NOT OVERTIGHTEN.
5. Mount the controller to the plate with the 4 mounting bolts (1/4-20 x 1.5" Socket Cap) with small diameter flat washers. (Fig 2) The washers MUST be installed on the bolts to protect the plastic controllers mount lugs. DO NOT OVERTIGHTEN.



(Fig 1) Nyloc nut locations from Step 1



(Fig 2) Controller Mounting shown with bolts and washers

FN - PROGRAMMING BOX

(OPTIONAL- XCT ONLY)

Customizable Knobs --

Use Alltrax Toolkit 3.0 or higher to set the ranges of each of the knobs and create personality profiles.

Adjust the drive performance how you want it while driving. Each knob can be adjusted to give you the lower and upper limits you want in the Toolkit software.

Use the free Alltrax Toolkit program to set the min/max values for your Speed/Acceleration/Regen sliders as well as the User Profiles.

Its quick and easy to set the range of the performance for your driving style.



FN2

Speed - Controls Speed, Acceleration or Both

Regen - Adjusts the cart Regen Braking Power



FN-KS

Mode - Switch between 1 of 3 customizable User Profiles.

Regen Knob adjusts the cart Regen Braking Power

FN - PROGRAMMING BOX

(OPTIONAL - XCT ONLY)

Installation:

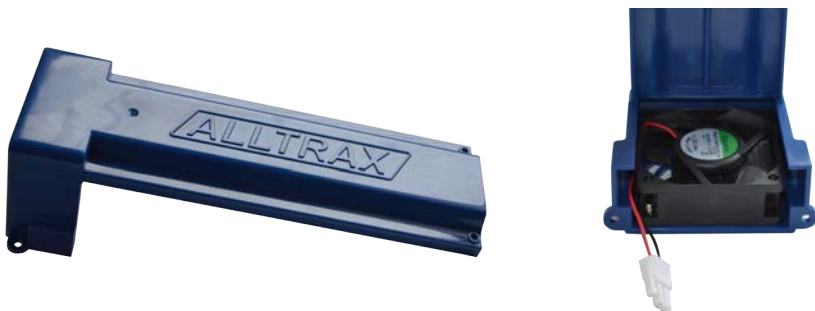
Easy to install, just plug the FN box into the connector on the controller, start the Toolkit program, select the FN box you have and set your preferences.



Visit our Youtube channel for instructional videos
<http://www.youtube.com/alltraxinc>

FAN COVER (OPTIONAL)

The XCT family of controllers also includes an optional Fan Cover. This cover comes standard on the 500A controllers.

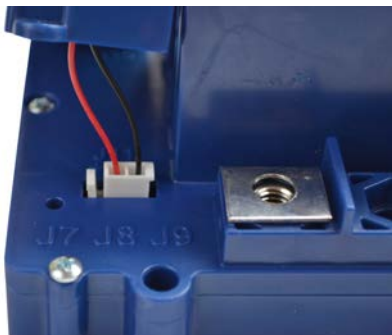


Installation:

1) Plug Fan Cover into controller fan port. (See picture)

2) Fasten cover down with the four (4) supplied screws.

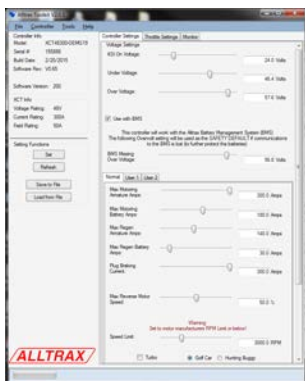
Note: Make sure wires are not tucked out of the way and are not being pinched by the cover.



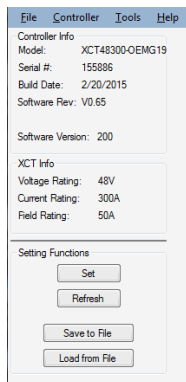
PROGRAMMING THE CONTROLLER

Controllers ordered for stock configurations are pre-programmed from Alltrax and it is not necessary to re-program unless the customer has specific needs. If the controller does need to be programmed it can be done via a USB A to B cable and the Alltrax Toolkit program. Visit our website for more information on programming the controller including the Alltrax Toolkit Manual (DOC113-002) and instructional videos.

Settings Screen



Controller Info Tab



The cable to use is the USB-A to B. This is the most common USB printer style cable available.

Throttle Screen



Monitor Screen



BLINK CODES

On power up, the controller will blink out a throttle code and then a Status or Error Code (see below)

Throttle codes:

1 Green LED Flash	=	0-5k throttle
2 Green LED Flash	=	5K-0 throttle
3 Green LED Flash	=	0-5V throttle
4 Green LED Flash	=	EZGO ITS throttle
5 Green LED Flash	=	Club Car, G19, G22
6 Green LED Flash	=	6 to 10.5 Taylor Dunn throttle
7 Green LED Flash	=	Reserved
8 Green LED Flash	=	Reserved
9 Green LED Flash	=	Pump
10 Green LED Flash	=	USB Throttle
11 Green LED Flash	=	Absolute Throttle

Normal Display Status:

Solid Green Light	=	Controller Ready to Run
Solid Red Light	=	Controller in programming mode
Solid Yellow Light	=	Throttle is wide open and the controller is <u>NOT</u> in Current Limit
Blinking Yellow Light	=	Throttle is wide open, but the controller is in Current Limit

Error Codes:

XCT/NCT Alarm Codes flash a number of times green then red. All alarms are self clearing and will repeat until the error condition has been corrected.

1 Green and 1 Red LED Flash	=	Short Circuit/Output Fault
1 Green and 2 Red LED Flash	=	Battery Under Voltage
1 Green and 3 Red LED Flash	=	Battery Over Voltage
1 Green and 4 Red LED Flash	=	Over temperature
1 Green and 5 Red LED Flash	=	Motor Field Failure
1 Green and 6 Red LED Flash	=	Pre-charge Failure

2 Green and 1 Red LED Flash	=	Under Temp
2 Green and 2 Red LED Flash	=	Not Used
2 Green and 3 Red LED Flash	=	High Throttle Over range
2 Green and 4 Red LED Flash	=	High Throttle Under range
2 Green and 5 Red LED Flash	=	Low Throttle Over range
2 Green and 6 Red LED Flash	=	Low Throttle Under range

3 Green and 1 Red LED Flash	=	Uncalibrated throttle
3 Green and 2 Red LED Flash	=	Bad Variable Set Loaded

Error Code Definitions:

- **Short Circuit/Output Fault:**
Controller detected a short circuit or other fault on the output circuit. Check wiring.
- **Battery Under Voltage:**
B+ Voltage lower than Low Voltage Battery Setting. Check pack voltage or program settings.
- **Battery Over Voltage:**
B+ Voltage Higher than Over Voltage Battery Setting. Check pack voltage or program settings
- **Over temperature:**
Busbar temperature exceeds 85°C. Let controller cool and/or add fan.
- **Motor Field Failure:**
Controller detected a short in the field circuit. Check motor resistance and or replace field wires.
- **Pre-charge Failure:**
B+ voltage and KSI voltage differ by more than 5v. Stuck solenoid.
- **Under Temp:**
Busbar Temperature reads less than -20°C
- **High Throttle Over range & High Throttle Under range:**
High Side of throttle signal is outside of acceptable window for that throttle type. Check and/or replace throttle. Change throttle type to correct throttle installed on car.
- **Low Throttle Over range & Low Throttle Under range:**
Low Side of throttle signal is outside of acceptable window for that throttle type. Check and/or replace throttle. Change throttle type to correct throttle installed on car.
- **Uncalibrated throttle:**
Throttle boundaries not found. In Toolkit program, select another throttle then re-select correct throttle type.
- **Bad Variable Set Loaded:**
Alltrax loaded variable data is missing or corrupted. Contact Alltrax.

WARRANTY STATEMENT

Alltrax, Inc., (hereafter Alltrax) warrants that the product purchased is free from defects in materials or 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, improper installation, submersion, alterations or use contrary to any instructions provided by Alltrax in verbal or written form.

In the event you should need warranty repair, contact Alltrax at (541) 476-3565 to receive warranty service authorization instructions for returning the defective product to Alltrax for evaluation. Products or parts shipped by customer to Alltrax must be sent postage paid and packaged appropriately for safe shipment. Alltrax is not responsible for customer products received without warranty service authorization and may be rejected.

Alltrax reserves the right to repair or replace merchandise at its option at no cost to the customer, except for shipping costs of sending the defect item to Alltrax. Replacement shall mean furnishing the customer with a new equivalent product to the defective item. Alltrax also reserves the right to make changes to any of its products or specifications without notice.

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