



www.alltraxinc.com

Operators Manual SR



Alltrax Inc

1111 Cheney Creek Road, Grants Pass, OR 97527 Ph: 541-476-3565 Fax: 541-476-3566
Web Site: <http://www.alltraxinc.com>

Twitter: @AlltraxInc

©ALLTRAX INC 2016 - All Rights Reserved

TABLE OF CONTENTS

SR LAYOUT	6
SR SPECIFICATIONS	7
INSTALLATION	8
DRAWINGS	
E-Z-GO PRE-1994	15
E-Z-GO TXT 94-PRESENT	16
CLUB CAR DS 95-PRESENT	17
YAMAHA G8, G9, G14 AND G16	18
GENERIC, PERM MAGNET MOTOR	19
GENERIC, PERM MAGNET MOTOR W/ REV	20
CONTROLLER DIMENSIONS	21
FAN COVER	22
BLINK CODES	24
WARRANTY STATEMENT	27

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 and watches.
- 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 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.

Note:

It is the installer's responsibility to ensure the correct equipment (ie. wire, motor, solenoid, fuse etc) is installed in the car.

**READ AND SAVE THESE
INSTRUCTIONS**

USABILITY STATEMENT

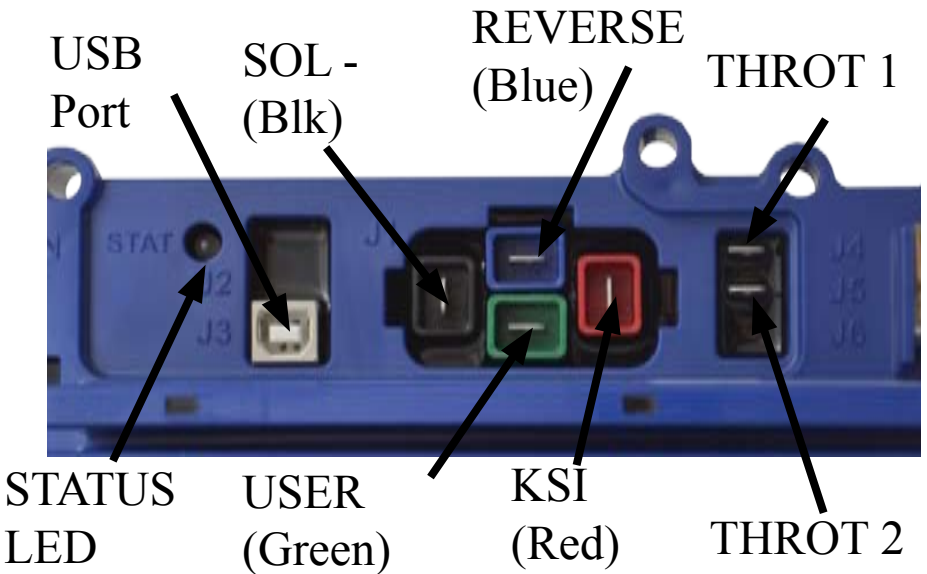
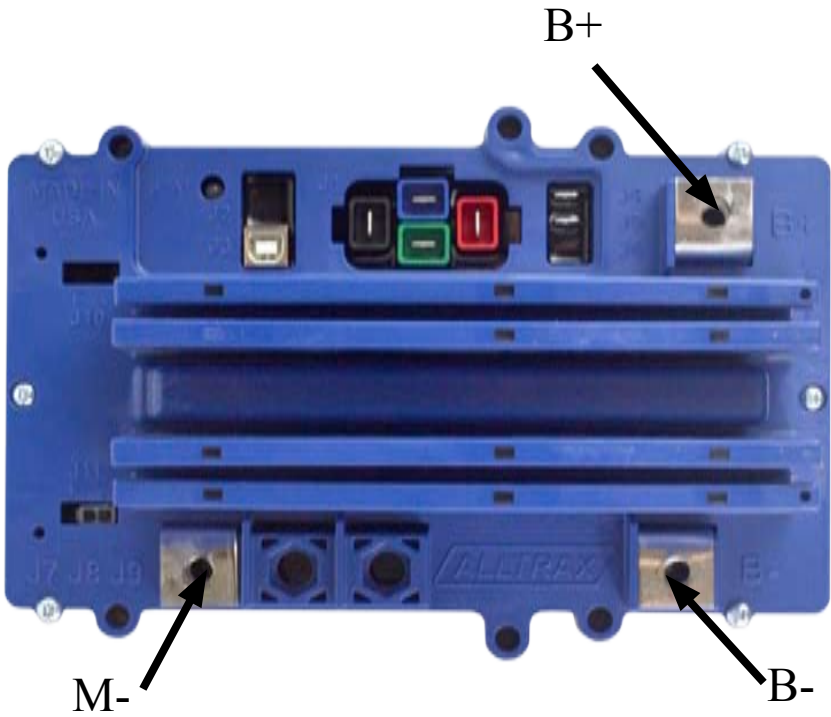


Alltrax Inc's lines of Series and Shunt Motor Controllers are intended for use with motors only. Any application or usage that does not meet these criteria WILL NOT be covered by warranty. Also, any requests for design assistance or technical support outside the scope of the product intended use may 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.

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.

SR LAYOUT



SR SPECIFICATIONS



Model	Peak (Amps)	2 Min (Amps)	5 Min (Amps)	Continuous (Amps)
SR48300	300/350 ¹	300 (1.5min)	230	210
SR48400	400/460 ¹	400	320	300
SR48500	500/575 ¹	500	420	380
SR48600	600/690 ¹	600	500	450
SR72300	300/350 ¹	300	250	220
SR72400	400/460 ¹	400 (1.5min)	300	270
SR72500	500/575 ¹	500	420	380

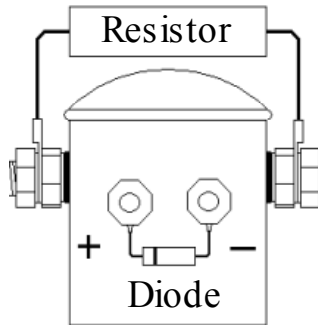
Note¹: The larger number represents the value when the “Peak Amp Mode” is enabled in the Alltrax Toolkit program.

All ratings are at 25°C with nominal rated voltages at 50% PWM. Actual currents are ±5% listed rating

Type:	Series Motor Controller
Operating Frequency:	18kHz
Controller Voltage, KSI & Reverse:	SR48XXX 12-48V nom, 62V max SR72XXX 12-72V nom, 90V max
Controller Operating Temp:	-20°C to 75°C, shutdown @ 85°C
Environmental Operating Temp:	-20°C to 50°C
Standby Current (Power up):	<1W nom, <8W Fan on
Stand By Power :	<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, Taylor Dunn 6v-10.5v, USB Throttle, Yamaha 0-1k, Absoute Mode
Terminal Torque:	Torque to 60-80 in.lb (5-7 ft/lb, 6.77-9.4Nm)

INSTALLATION

Resistor & 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

The resistor typically seen across the contactors big terminals pre-charges the filter capacitors in the controller. This minimizes arcing across the contactor terminals when closing.

Battery Voltage	Resistor
12-36V	220-250 Ohm 10W
48V	470 Ohm 10W
72V	1000 Ohm 10W



F/R Switch

The forward/reverse switch is an often overlooked part of the upgrade process. In a series motor, all of the motor current will pass through the F/R switch. An undersized F/R Switch is as bad as an undersized solenoid or small wire gauge.

For higher amperage controllers (>600A), it is suggested that a change-over contactor set up be used. These are large enough to handle the higher currents without over heating the contacts and they provide the user the ability to change direction by flipping a switch.

Controller Amperage	F/R Size
400A or less	Stock/HD
450A to 650A	Heavy Duty/Change-Over Contactor
650A or more	Change-Over Contactor



Change-over contactors are multiple contactors bound together that allow the user to change the polarity of the voltage going to the motor thus reversing direction. It works exactly the same as the manual F/R switch, except that it uses coil drive contactors. See the installation drawings for how to wire a change-over contactor.

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.

UNACCEPTABLE



Stock 70 AMP

Used with older ClubCars vehicles

DO NOT Use with Alltrax Controller

STANDARD DUTY

Flat lands with moderate speed and torque performance expectations.



Stock 100 AMP

Use with 300A controllers.

HEAVY DUTY

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



Performance 200 AMP
(600amp Inrush) Use with 300
and 400 AMP Controllers



Heavy Duty 200 AMP
(800A surge) Use with 300 to
500 AMP Controllers



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

EXTREME DUTY



Extreme Duty 600A+ AMP
(1000A + surge) Use with 600
AMP or bigger Controllers.

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 B+, B- or in-between 2 batteries is an acceptable location. The fuse must be rated for pack voltage and fault current.



Controller Amperage	Fuse Rating
400A or less	250A
450A to 650A	400A
650A or more	600A

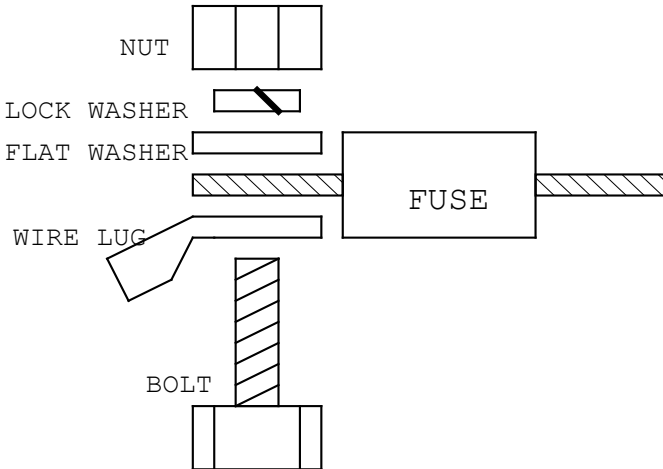


Diagram: Fuse terminal hardware

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
300A	OEM -6 AWG	4 AWG
400A	4 AWG	4 AWG
500A	2 AWG	1/0 AWG
600A	1/0 AWG	2/0 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

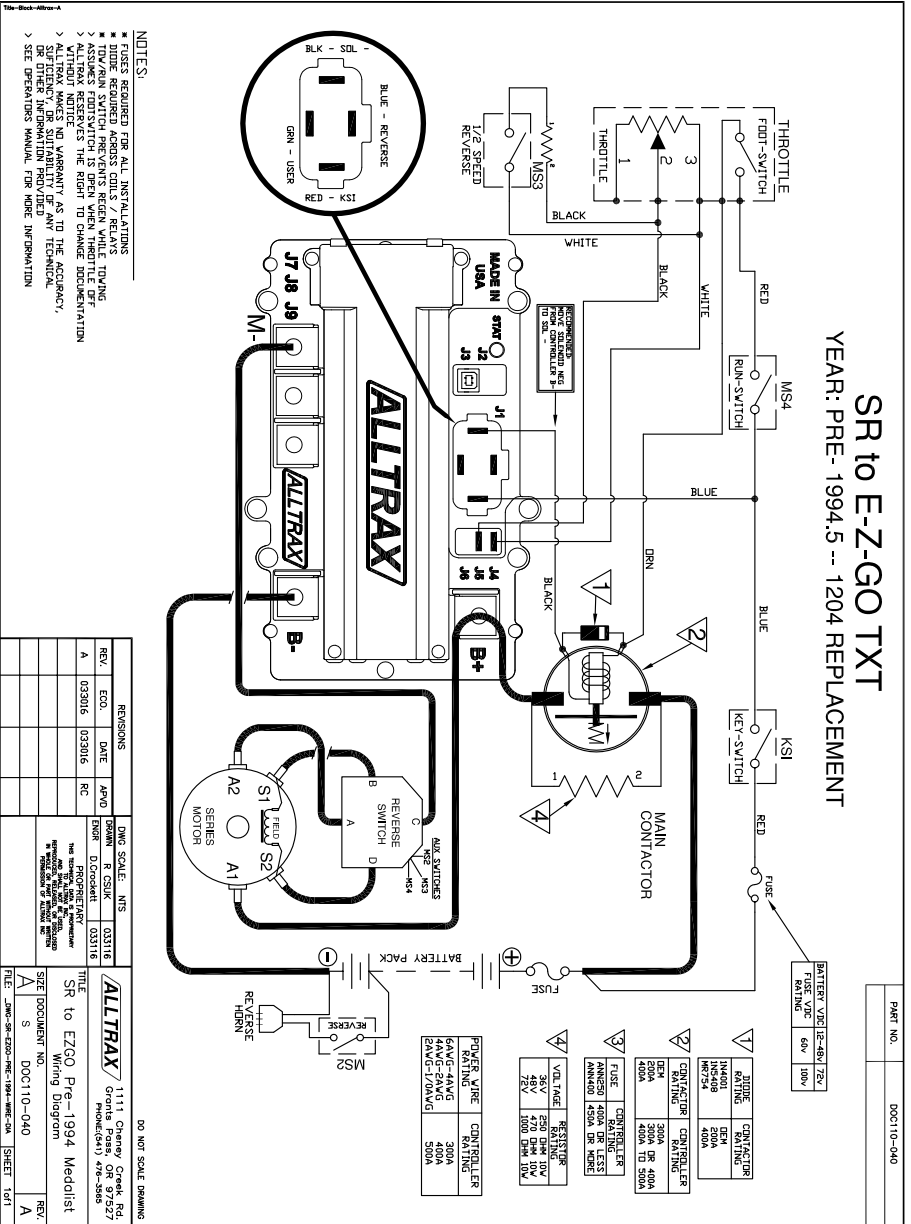
Signal wires should be keep as short as practical. Care should be taken to protect the wires sharp edges and rubbing. Consider the use of split loom or braided wire sheathing. Fasten bundles securely to framework. Do not route the signal wires together in the same bundle with power wires.

INSTALLATION DRAWINGS

See our Website more drawings:
Full Sized & Updated
800A and HD Models

PRE-1994 EZGO

SR to E-Z-GO TXT YEAR: PRE-1994.5 -- 1204 REPLACEMENT



PART NO. DOC110-040

NOTES:

- 1. FUSES REQUIRED FOR ALL INSTALLATIONS.
- 2. THROTTLE SWITCH PREVENTS REVERSE WHILE TOWING.
- 3. TOW/RUN SWITCH PREVENTS REVERSE WHILE TOWING.
- 4. ASSUMES FOOT SWITCH IS OPEN WHEN THROTTLE OFF.
- 5. WITHOUT NOTICE THE RIGHT TO CHANGE SPECIFICATIONS.
- 6. WITHOUT NOTICE.
- 7. ALLTRAX MAKES NO WARRANTY / AS TO THE ACCURACY, COMPLETENESS, OR SUITABILITY OF THIS INFORMATION OR OTHER INFORMATION PROVIDED.
- 8. SEE OPERATOR'S MANUAL FOR MORE INFORMATION.

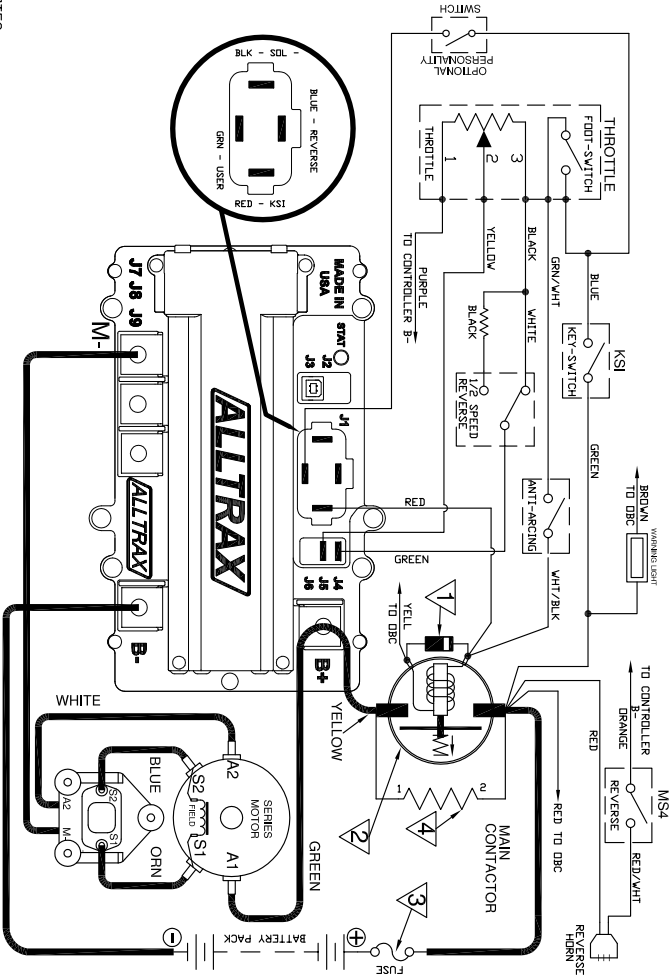
REVISONS		DWG SCALE	INS
REV.	ECO.	DATE	BY
A	033016	033016	RC

ALLTRAX 1111 Cheney Creek Rd. Omaha, Nebraska 68131 (402) 426-4444	
TITLE	SR to EZGO Pre-1994 Meddolist
Wiring Diagram	
SIZE	DOC110-040
REV.	A
SHEET	1 of 1

1994 AND NEWER CLUB CAR

SR to CLUB CAR DS YEAR: 1995 TO PRESENT

PART NO. DOC110-037



1	WIRE	36V	RESISTOR	CONVERTER
2	WIRE	48V	250 OHM 10W	GEN
3	WIRE	48V	470 OHM 10W	GEN
4	WIRE	48V	100 OHM 10W	GEN
5	WIRE	48V	100 OHM 10W	GEN

1	FUSE	400A	CONVERTER
2	FUSE	400A	GEN
3	FUSE	400A	GEN
4	FUSE	400A	GEN
5	FUSE	400A	GEN

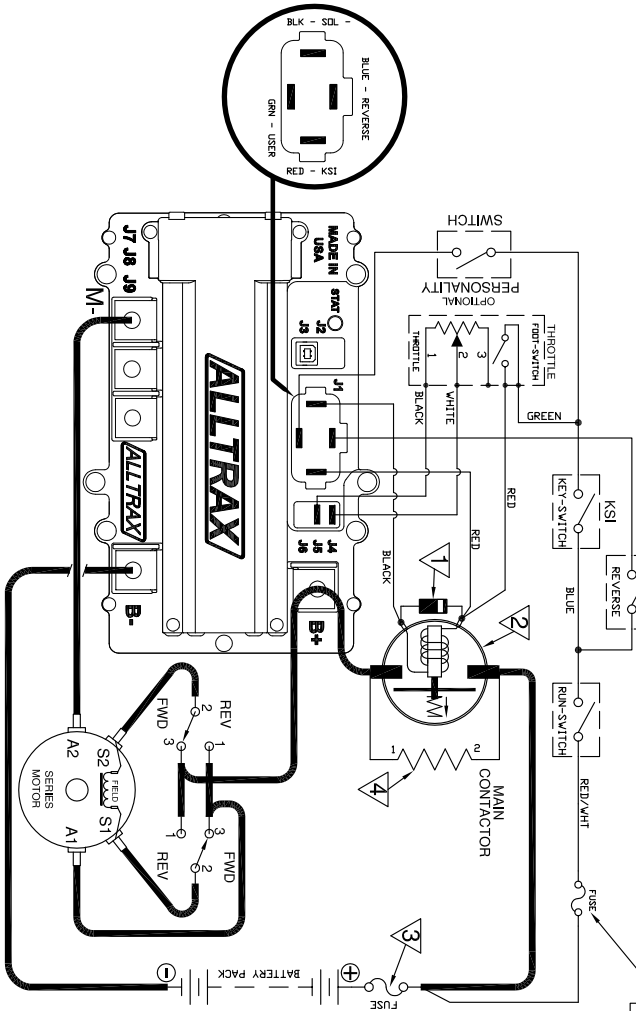
1	WIRE	36V	RESISTOR	CONVERTER
2	WIRE	48V	250 OHM 10W	GEN
3	WIRE	48V	470 OHM 10W	GEN
4	WIRE	48V	100 OHM 10W	GEN
5	WIRE	48V	100 OHM 10W	GEN

- NOTES:
- ▶ FUSES REQUIRED FOR ALL INSTALLATIONS
 - ▶ ALL WIRING MUST BE DONE IN ACCORDANCE WITH THE 1995 NATIONAL ELECTRICAL CODE
 - ▶ THROTTLE SWITCH IS OPEN WHEN THROTTLE IS OPEN
 - ▶ ASSUMES THROTTLE SWITCH IS OPEN WHEN THROTTLE IS OPEN
 - ▶ WITHOUT NOTICE THE RIGHT TO CHANGE DESIGNATION
 - ▶ ALLTRAX MAKES NO WARRANTY AS TO THE ACCURACY, COMPLETENESS, OR TIMELINESS OF THIS INFORMATION
 - ▶ SEE OPERATOR'S MANUAL FOR MORE INFORMATION

REV. ECU. DATE APD/		REVISIONS	
A	033016	033016	RC
DRAWN R. CSJK		DWG SCALE: NTS	
CHECKED D. O'CONNOR		DATE 03/11/18	
DESIGNED BY J. H. HARRIS		DATE 03/11/18	
ALLTRAX INC. 1111 Cherry Creek Rd. Omaha, NE 68134 TEL: 402-491-1111 FAX: 402-491-1112 WWW.ALLTRAXINC.COM © 2018 ALLTRAX INC. ALL RIGHTS RESERVED.			
TITLE		SR to Club Car DS	
Wiring Diagram		SIZE DOCUMENT NO.	
DOC110-037		REV. A	
FILE: JMC-36-CLUB-CAR-55-WIR-COM		SHEET 1 of 1	

GENERIC, SERIES WITH REVERSE

SR - GENERIC WIRING WITH REVERSE



BATTERY VOLTAGE	12-48V 72V
MAXIMUM CURRENT	60A 100A

1	WIRE GAUGE	CONDUCTOR
1	14-16	200A
2	18-20	300A
3	22-24	400A
4	28-30	500A

2	CONDUCTOR	200A
3	CONDUCTOR	300A
4	CONDUCTOR	400A
5	CONDUCTOR	500A

3	FUSE	CONDUCTOR
3	14-16	200A
4	18-20	300A
5	22-24	400A
6	28-30	500A

4	VOLTAGE	BATTERY
4	48V	470 DM 10V
5	72V	1000 DM 10V

POWER WIRE	CONDUCTOR
44VDC-48VDC	300A
44VDC-24VDC	400A
60VDC-170VDC	500A

NOTES:

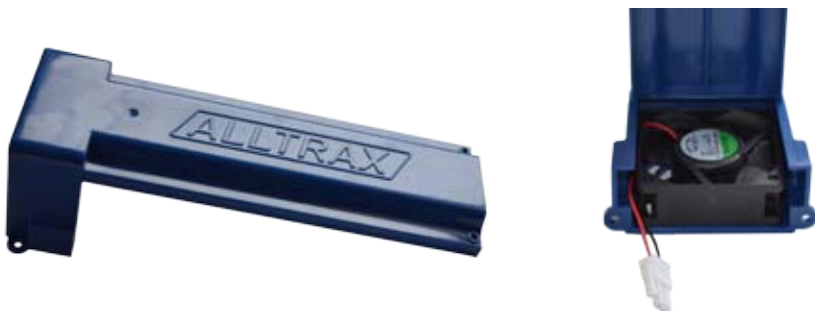
- > FUSES REQUIRED FOR ALL INSTALLATIONS
- > FUSES MUST BE INSTALLED IN SERIES
- > THROTTLE SWITCH PREVENTS REVERSE WHILE THROTTLE UP
- > ASSUMES FOOT SWITCH IS OPEN WHEN THROTTLE UP WITHOUT NOTICE
- > WITHOUT NOTICE
- > ALLTRAX MAKES NO WARRANTY AS TO THE ACCURACY, COMPLETENESS, OR FITNESS FOR ANY PARTICULAR OR OTHER INFORMATION PROVIDED
- > SEE OPERATOR'S MANUAL FOR MORE INFORMATION

REVISIONS		DWG SCALE	INS
REV.	ECO.	DATE	BY/CD
A	023016	023016	RC

ALLTRAX 1111 Chevy Creek Rd., Omaha, NE 68131	
TEL: 402-491-5200 FAX: 402-491-5205	
SR to Generic Series Reverse Wiring Diagram	
SIZE	DOCUMENT NO.
A	S DDC110-039
REV.	SHEET 1 of 1

FAN COVER (OPTIONAL)

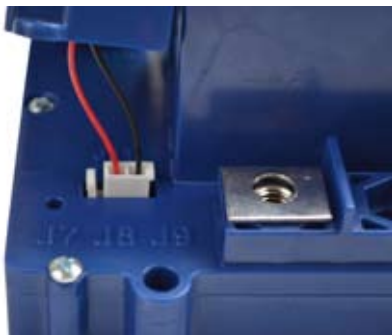
The XCT family of controllers also includes an optional Fan Cover. This cover comes standard on the 500A & 600A controllers.



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 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

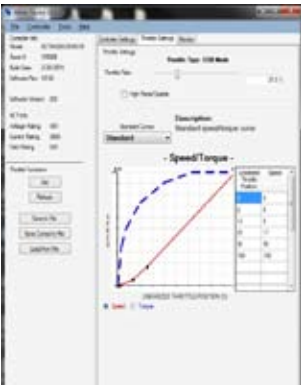


Controller Info Tab



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

Throttle Screen



Monitor Screen



BLINK CODES

The throttle code blinks on controller power up and alarm codes blink when the alarm happens. All alarms are self clearing so when the alarm event is over, the controller resumes normal operation, except for the Short Circuit alarm that needs a power off cycle to clear the alarm.

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	=	0-1k Yamaha throttle
6 Green LED Flash	=	6 to 10.5 Taylor Dunn throttle
7 Green LED Flash	=	Club Car 5k-0 3 wire throttle
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:

SR error codes are different than the AXE/DCX alarm codes in that they will flash Green and Red, instead of just Red.

1 Green and 1 Red LED Flash	=	Short Circuit
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	=	M- Over temperature
1 Green and 5 Red LED Flash	=	Bus Bar Over temperature
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.

Alltrax assumes no liability for applications assistance or customer product design. Customers shall be responsible for evaluating the appropriateness of the use of any Alltrax product in any application. Customers shall provide adequate design and operating safeguards that are in compliance with standard practices of other similar applications or any standards of any governing agency.

THIS IS ALLTRAX INC.'S, SOLE WARRANTY.

NO REPRESENTATIVE EMPLOYEE, DISTRIBUTOR OR DEALER OF ALLTRAX HAS THE AUTHORITY TO MAKE OR IMPLY ANY WARRANTY, REPRESENTATION, PROMISE OR AGREEMENT, WHICH IN ANY WAY VARIES THE TERMS OF THIS LIMITED WARRANTY.

ALLTRAX PRODUCTS SOLD TO CUSTOMER ARE INTENDED TO BE USED ONLY IN THE APPLICATION SPECIFIED BY THE CUSTOMER TO ALLTRAX. ANY OTHER USE RENDERS THE LIMITED WARRANTY EXPRESSED HEREIN AND ALL IMPLIED WARRANTIES NULL AND VOID AND SAME ARE HEREBY EXCLUDED.

DISCLAIMER OF IMPLIED WARRANTIES

ALLTRAX, INC., SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY, OR FOR INCIDENTAL, CONTINGENT, OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OR MISUSE OF OUR PRODUCTS.

EXCEPT SPECIFICALLY PROVIDED HEREIN, THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HOWEVER, SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE PRECEDING EXCLUSION MAY NOT APPLY TO YOU.

