

PRELIMINARY

POWER INPUT AND RS485 COMMUNICATION

+12V TO +48V
 GROUND
 RS485 B
 RS485 A

ENCODER1

GROUND
 INDEX
 CHAN A
 +5V
 CHAN B

XXX

LED POWER
 INPUT
 GROUND
 LED POWER
 INPUT
 GROUND

USB CONNECTION

USB

DIGITAL I/O CONNECTOR

OPTO SENSOR #1 GROUND / SW CLOSURE GND
 OPTO SENSOR #1 PHOTO TRANSISTOR
 OPTO SENSOR #1 LED
 OPTO SENSOR #2 GROUND / SW CLOSURE GND
 OPTO SENSOR #2 PHOTO TRANSISTOR
 OPTO SENSOR #2 LED
 SWITCH CLOSURE TO GROUND INPUT
 SWITCH CLOSURE TO GROUND INPUT

POWER OUTPUT DRIVERS

1 AMP ON/OFF DRIVER #1 +
 1 AMP ON/OFF DRIVER #1 -
 1 AMP ON/OFF DRIVER #2 +
 1 AMP ON/OFF DRIVER #2 -

ADDRESS SWITCH

STATUS LED

LED POWER
 INPUT
 GROUND **XXX**
 LED POWER
 INPUT
 GROUND
 LED POWER
 INPUT
 GROUND **XXX**
 LED POWER
 INPUT
 GROUND

LIFE LED

TTL XXX
 PWM XXX
 DIR XXX
 STEP XXX
 GROUND
 +24V

MOTOR 3 CONTROL XXX

MOTOR1 A+
 MOTOR1 A-
 MOTOR1 B+
 MOTOR1 B-

MOTOR 1 DRIVE

TTL XXX
 PWM XXX
 DIR
 STEP
 GROUND
 +24V

MOTOR 2 CONTROL

DO NOT UNPLUG LOADS WHILE POWER IS ON. THE INDUCTANCE OF THE MOTOR WILL GENERATE A HIGH VOLTAGE WHICH WILL DAMAGE THE DRIVER CHIP

MOTOR 2 CONTROL OUTPUTS COMPATIBLE WITH EZINCH DRIVER, AT LESS THAN 30V

DO NOT UNPLUG LOADS WHILE POWER IS ON

ENCODER2

CHAN B
 +5V
 CHAN A
 INDEX
 GROUND
 GROUND

LED POWER
 INPUT
 GROUND
 LED POWER
 INPUT
 GROUND **XXX**

COPYRIGHT ALLMOTION.COM
48 VOLT DRIVER CONTROLLER

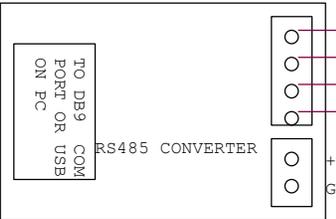
Title		
ALLMOTION.COM	EZ STEPPER WIRING DIAGRAM	
Size B	Document Number	Rev A3
Date:	Thursday, August 29, 2013	Sheet 1 of 5

XXX = NOT YET SUPPORTED BY SOFTWARE

↓ PAGE DOWN ↓

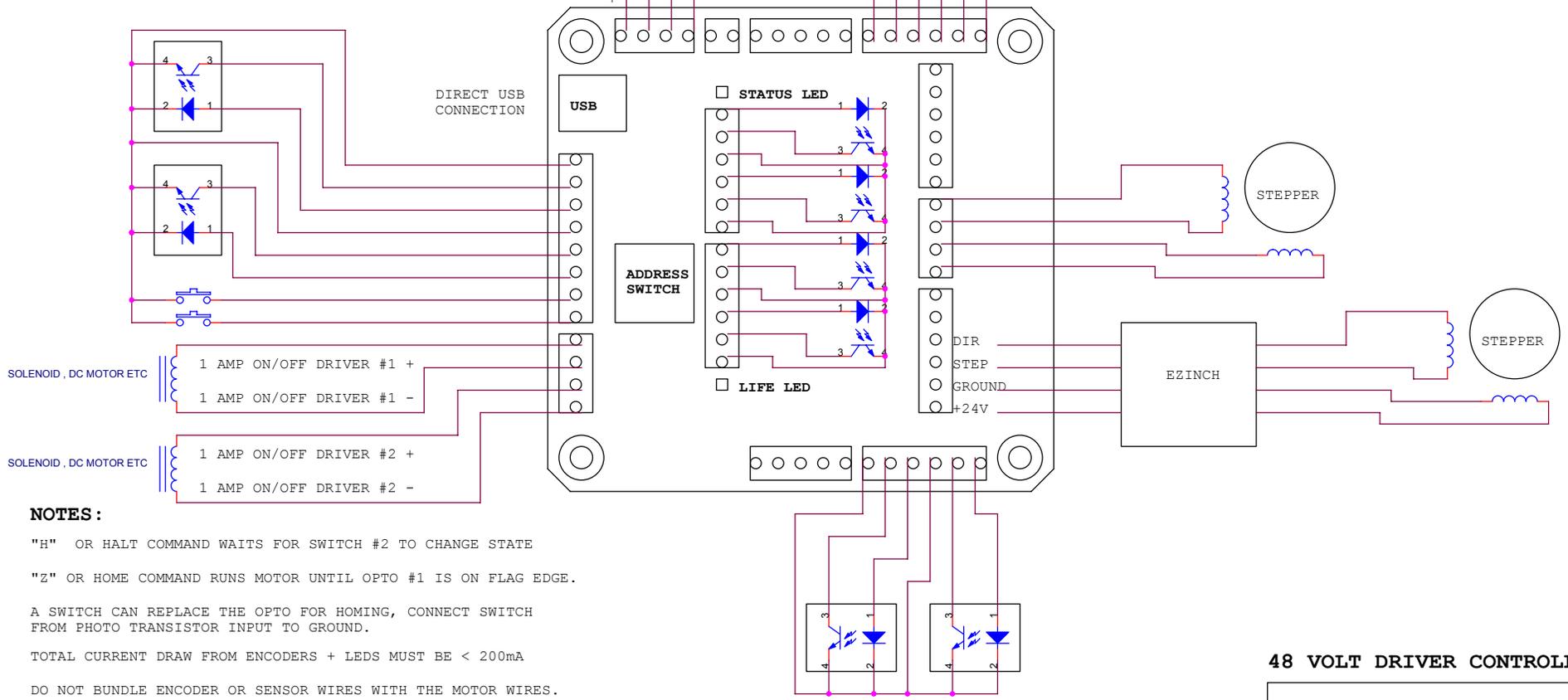
TO PC COM PORT
OR USB

USE 9600 BAUD
8BIT, NO PARITY,
1 STOP, NO FLOW
CTRL.



TO OTHER
EZ STEPPERS

PRELIMINARY



- NOTES :**
- "H" OR HALT COMMAND WAITS FOR SWITCH #2 TO CHANGE STATE
 - "Z" OR HOME COMMAND RUNS MOTOR UNTIL OPTO #1 IS ON FLAG EDGE.
 - A SWITCH CAN REPLACE THE OPTO FOR HOMING, CONNECT SWITCH FROM PHOTO TRANSISTOR INPUT TO GROUND.
 - TOTAL CURRENT DRAW FROM ENCODERS + LEDS MUST BE < 200mA
 - DO NOT BUNDLE ENCODER OR SENSOR WIRES WITH THE MOTOR WIRES.
 - SHIELD MOTOR WIRES WITH A GROUNDED BRAID TO REDUCE EMI

48 VOLT DRIVER CONTROLLER

Title		ALLMOTION.COM	EZ STEPPER WIRING DIAGRAM
Size	Document Number		Rev
B			A3
Date:	Thursday, August 29, 2013	Sheet	2 of 5

48V DRIVER CONTROLLER ACCESSORIES AND OTHER ELECTRICAL NOTES

MATING CONNECTORS:

AMP MTA 100 SERIES
 4PIN 22 GA DIGIKEY P/N A31108 (INPUT / MOTOR / OUTPUT CONNECTOR)
 8PIN 26 GA DIGIKEY P/N A31030 (FOR OPTOS)
 6PIN 26 GA DIGIKEY P/N A31028 (FOR OPTOS)
 5PIN 26 GA DIGIKEY P/N A31027 (FOR ENCODER)
 T HANDLE CRIMP TOOL DIGIKEY P/N A9982
 PISTOL GRIP TOOL DIGIKEY P/N A1998 + A2031

FOR CRIMP STYLE CONNECTORS SEARCH "CST CRIMP" ON DIGIKEY.COM

MOTORS:

- 1) THE EZ STEPPER WILL DRIVE MOST STEPPER MOTORS
- 2) FOR BEST PERFORMANCE SELECT A MOTOR THAT IS RATED AT ABOUT 1/4 OF THE SUPPLY VOLTAGE. (Eg USE A 6V MOTOR WITH A 24V SUPPLY).
- 3) FOR (UNIPOLAR) STEPPER MOTORS WITH CENTER TAPPED WINDINGS , TYPICALLY LEAVE THE CENTER TAP UNCONNECTED, OR WIRE PER MANUFACTURERS RECOMMENDATIONS.

SUITABLE POWER SUPPLIES:

- 1) FOR FIRST TIME USERS, TO GUARD AGAINST A POSSIBLE MISWIRE, A CURRENT LIMITED LAB SUPPLY SET TO 12V AND 0.5A IS RECOMMENDED.
- 2) A SUPPLY OF 24V AND 2A CAPABILITY IS GOOD FOR MOST PURPOSES. POSSIBLE CHOICES ARE:
 DIGIKEY P/N 237-1296-ND
 DIGIKEY P/N 237-1395-ND (ENCLOSED)
- 3) INPUT CURRENT IS MUCH LESS THAN MOTOR CURRENT DUE TO THE SWITCHING (PWM). IT CAN BE CALCULATED BY CONSIDERING CONSERVATION OF POWER. HOWEVER IT IS IMPORTANT TO MAKE SURE THAT THE SUPPLY WILL NOT FOLD BACK AS IT IS COMING UP SINCE THE EZ STEPPER WILL DRAW MORE CURRENT AT LOWER VOLTAGES.

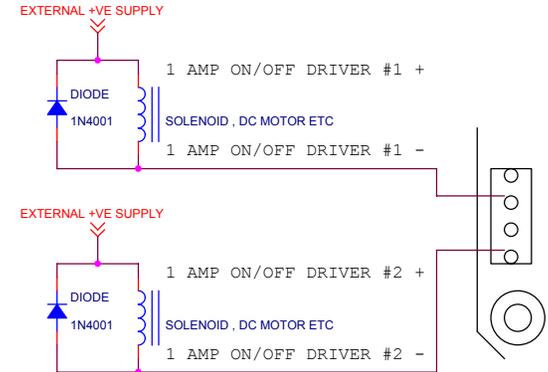
OPTO HOME SWITCH:

- 1) "Z" OR HOME COMMAND RUNS MOTOR UNTIL OPTO #1 IS ON FLAG EDGE.
- 2) AN OPTO SWITCH PROVIDED WITH EACH STARTER KIT
- 3) USE TRANSISTOR OPTO THAT HAS $I_c > 1mA$ @ $I_F = 20mA$.
- 4) EXAMPLES OF ACCEPTABLE OPTOS ARE:
 DIGIKEY P/N QVA11134
 DIGIKEY P/N H21A1
 HONEYWELL HOA1887-012 (IS PREWIRED)
 HONEYWELL HOA1870-33 (IS PREWIRED)
 OPTEK OPB830W11 (IS PREWIRED)
- 5) THE OPTO COUPLER LED PIN HAS 150 OHM TO 5V IN SERIES ON THE BOARD. THE 150 OHM CAN BE REMOVED IF DESIRED FOR RUNNING SENSORS THAT REQUIRE DIRECT ACCESS TO 5V. THE COLLECTOR OF THE TRANSISTOR HAS A 10K PULLUP TO 5V.
- 6) ALL INPUTS WORK ON TTL LEVEL SIGNALS

ON/OFF DRIVERS ALTERNATE WIRING DIAGRAM

- 1) ON/OFF DRIVERS RATED AT 2 AMPS PEAK, 1 AMP CONTINUOUS.
- 2) THE NEGATIVE PIN OF THESE DRIVERS IS ACTUALLY AN OPEN COLLECTOR TYPE OUTPUT THAT PULLS DOWN TO GROUND. IT IS POSSIBLE TO DRIVE LOADS THAT ARE OF A DIFFERENT VOLTAGE THAN THE SUPPLY VOLTAGE, BY CONNECTING THE POSITIVE SIDE OF THE LOAD TO AN EXTERNAL SUPPLY, AND THE NEGATIVE SIDE TO THE -VE OUTPUT PIN. HOWEVER, IN CASE THIS IS DONE IT IS NECESSARY TO PLACE AN EXTERNAL "FREE WHEELING" DIODE ACROSS ANY INDUCTIVE LOADS. EXTERNAL SUPPLY VOLTAGE MUST BE LESS THAN SUPPLY VOLTAGE TO EZ STEPPER
- 3) EXTERNAL DIODE IS NOT NECESSARY IF BOTH SIDES OF LOAD ARE WIRED BACK TO THE EZ STEPPER.

ON/OFF DRIVERS ALTERNATE WIRING DIAGRAM



EXTERNAL SUPPLY VOLTAGE MUST BE LESS THAN SUPPLY TO EZ STEPPER

PAGE DOWN FOR MORE INFO

COPYRIGHT ALLMOTION.COM

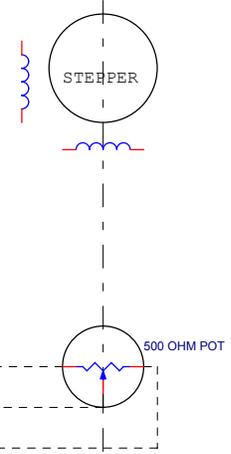
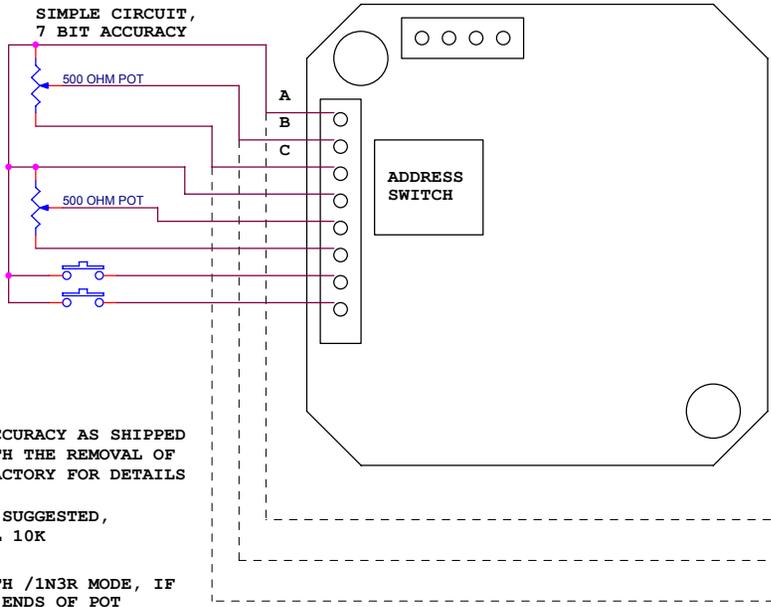
48 VOLT DRIVER CONTROLLER

Title ALLMOTION.COM EZ STEPPER WIRING DIAGRAM		
Size B	Document Number	Rev A3
Date: Thursday, August 29, 2013 Sheet 3 of 5		

FEEDBACK POT1 GROUND
 FEEDBACK POT1 WIPER
 FEEDBACK POT1 POWER

POSITION COMMAND POT2 GROUND
 POSITION COMMAND POT2 WIPER
 POSITION COMMAND POT2 POWER

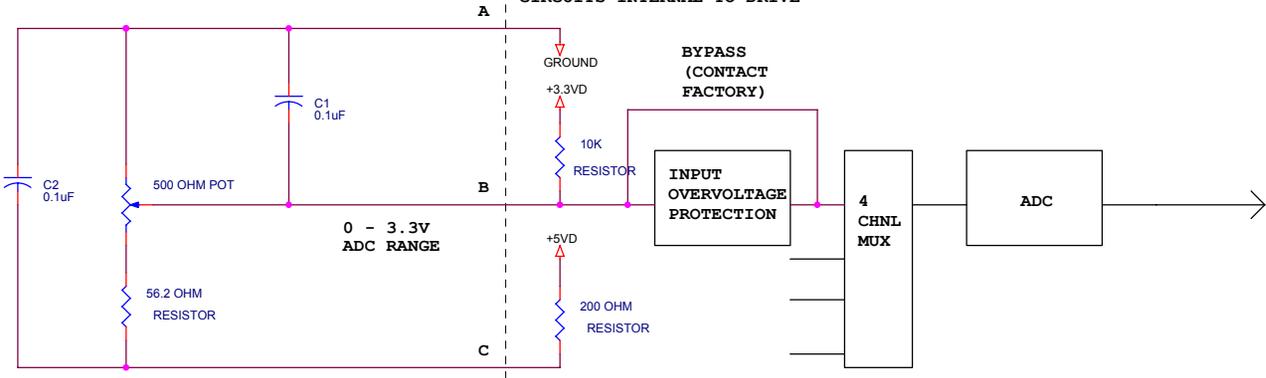
SWITCH #1 CLOSURE TO GROUND INPUT
 SWITCH #2 CLOSURE TO GROUND INPUT



NOTES:

- 1) ALL 4 INPUTS ARE ANALOG INPUTS
- 2) ADC's VALUES RANGE FROM 0-16368. THE ACCURACY AS SHIPPED IS 7 BIT BUT CAN BE IMPROVED TO >10BIT WITH THE REMOVAL OF THE INPUT PROTECTION CIRCUITRY, CONTACT FACTORY FOR DETAILS
- 3) POTS IN THE RANGE OF 500 OHM - 10K ARE SUGGESTED, LOWER VALUES ARE LESS AFFECTED BY INTERNAL 10K PULLUP. 500 OHM RECOMMENDED.
- 4) IF USING POT FOR POSITION FEED BACK WITH /1N3R MODE, IF MOTOR EXHIBITS POSITIVE FEEDBACK, SWITCH ENDS OF POT
- 5) 10K INTERNAL PULLUP WILL INTERFERE WITH LINEARITY OF POT VOLTAGE, AND MAY NEED TO BE REMOVED - CONTACT FACTORY.
- 6) INPUT OVERVOLTAGE PROTECTION CIRCUITRY MAY NEED TO BE REMOVED FOR >7BIT ACCURACY - CONTACT FACTORY.

CIRCUITS INTERNAL TO DRIVE

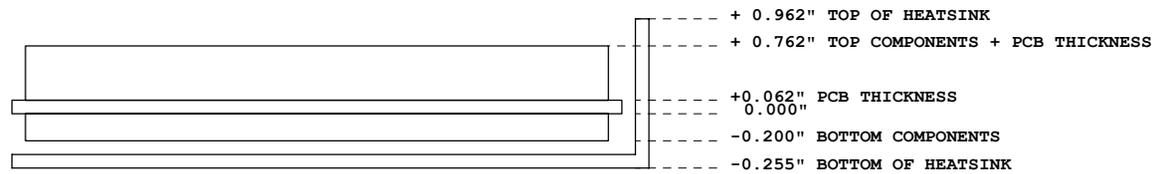
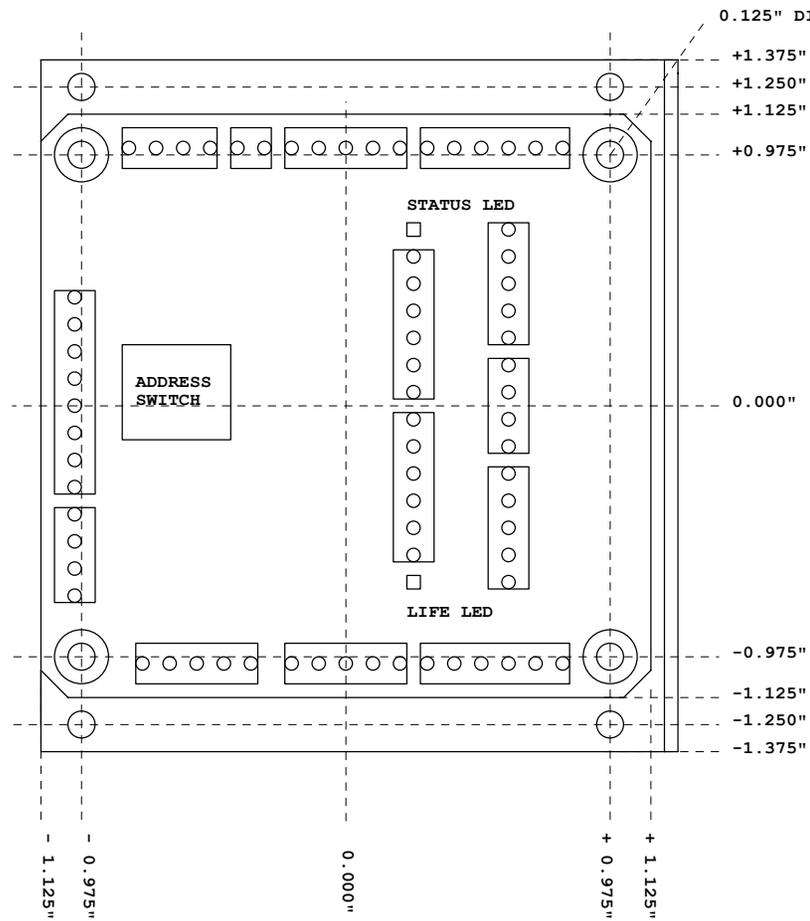


ENHANCED EXTERNAL CIRCUIT FOR > 10BIT ACCURACY

WIRING DIAGRAM ANALOG INPUT OR POTENTIOMETER FEEDBACK

Title		ALLMOTION.COM EZ STEPPER WIRING DIAGRAM	
Size	Document Number	Rev	
B		A3	
Date:	Thursday, August 29, 2013	Sheet	4 of 5

COPYRIGHT ALLMOTION.COM



48V CONTROLLER DRIVER DIMENSIONAL INFORMATION

48 VOLT DRIVER CONTROLLER
COPYRIGHT ALLMOTION.COM

Title		ALLMOTION.COM DIMENSIONAL INFO	
Size	Document Number	Rev	
B		A3	
Date:	Thursday, August 29, 2013	Sheet	5 of 5