

**POWER INPUT
AND RS485
COMMUNICATION**

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

ENCODER1

GROUND
INDEX
CHAN A
+5V
CHAN B

LED POWER **XXX**

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

☐ **LIFE LED**

**MOTOR 3
CONTROL
XXX**

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

**MOTOR 1
DRIVE**

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

**MOTOR 2
CONTROL**

TTL XXX
PWM XXX
DIR
STEP
GROUND
+24V

ENCODER2

CHAN B
+5V
CHAN A
INDEX
GROUND
GROUND
LED POWER
INPUT
GROUND

LED POWER **XXX**

INPUT
GROUND
LED POWER
INPUT
GROUND

PRELIMINARY

**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**

XXX = NOT YET SUPPORTED BY SOFTWARE

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48 VOLT DRIVER CONTROLLER**

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ALLMOTION.COM EZ STEPPER WIRING DIAGRAM		
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TO PC COM PORT
OR USB

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

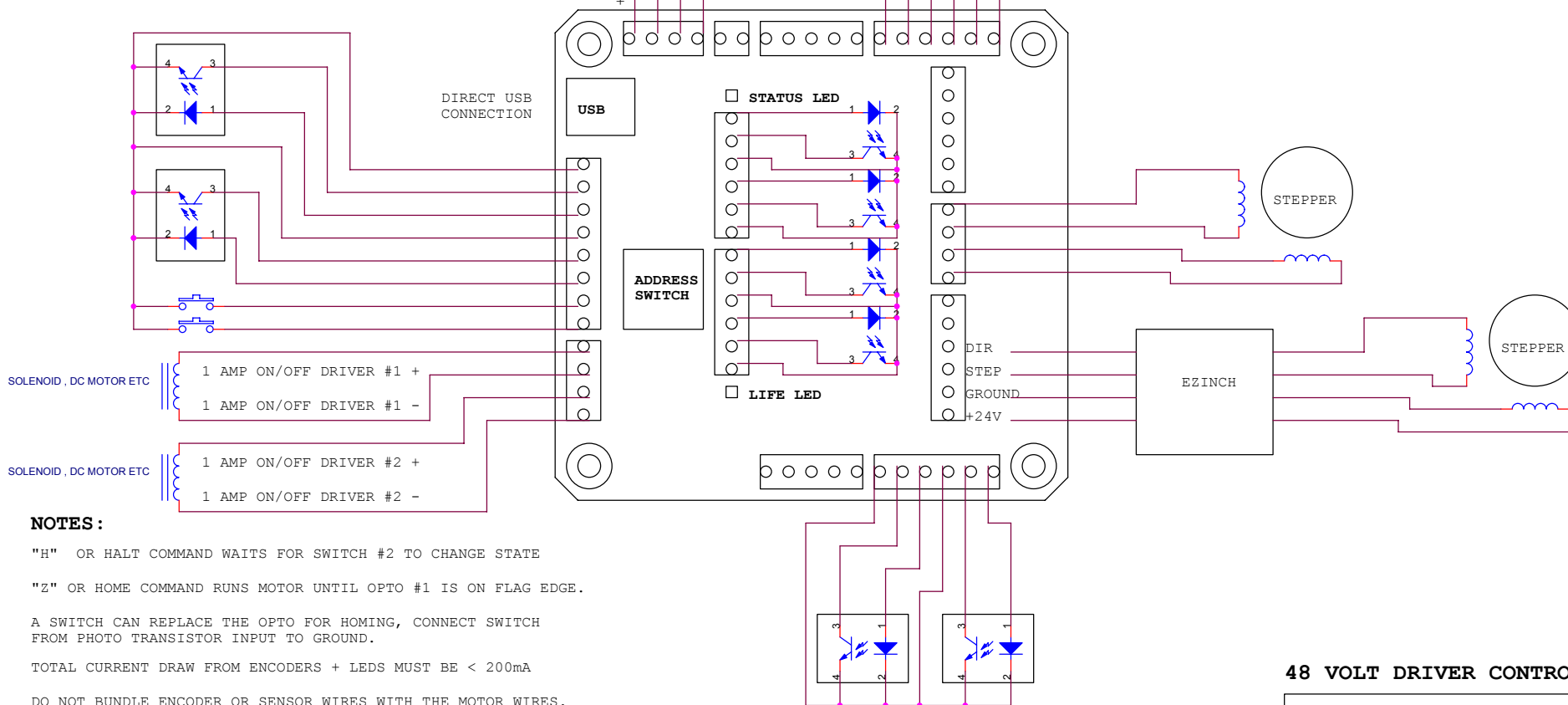
TO DB9 COM
PORT OR USB
ON PC

RS485 CONVERTER

+12V TO +48V
GROUND

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

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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 CALULATED 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 $I_c > 1\text{mA}$ @ $I_F = 20\text{mA}$.
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

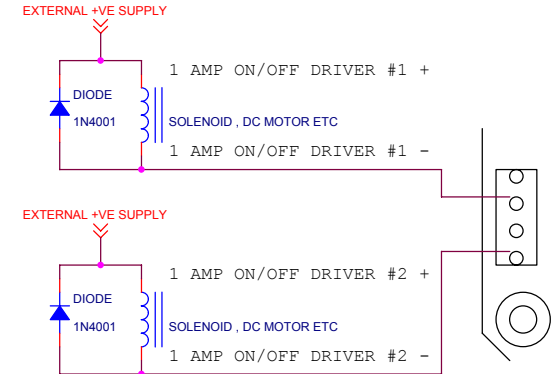
ON/OFF DRIVERS ALTERNATE WIRING DIAGRAM

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

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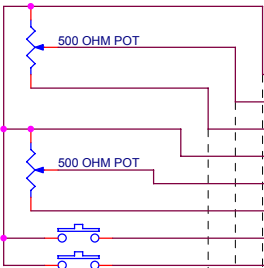
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FEEDBACK POT1 GROUND
FEEDBACK POT1 WIPER
FEEDBACK POT1 POWER

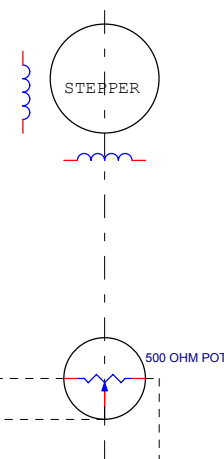
POSITION COMMAND POT2 GROUND
POSITION COMMAND POT2 WIPER
POSITION COMMAND POT2 POWER

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

SIMPLE CIRCUIT,
7 BIT ACCURACY



ADDRESS
SWITCH



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

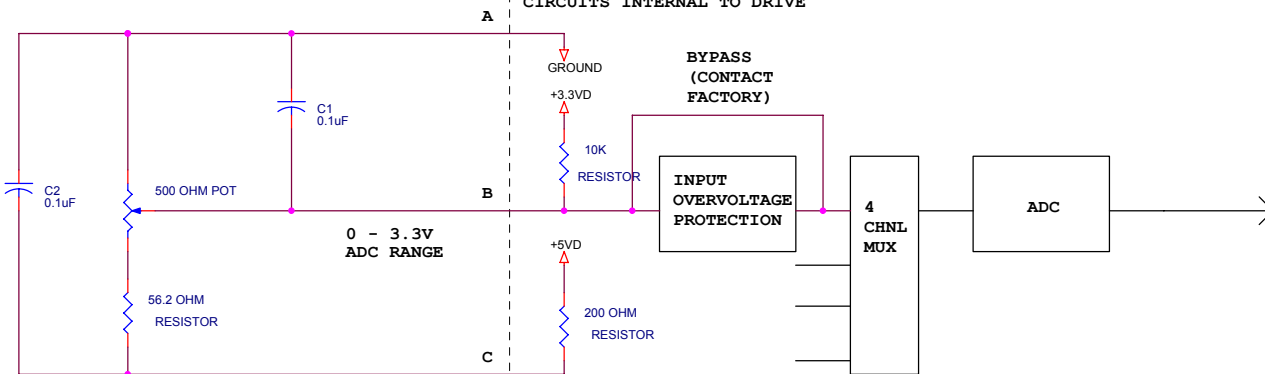
3) POTS IN THE RANGE OF 500 OHM - 10K ARE SUGGESTED, LOWER VALUES ARE LESS AFFECTED BY INTERNAL 10K PULLUP. 500 OHM RECOMMENDED.

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

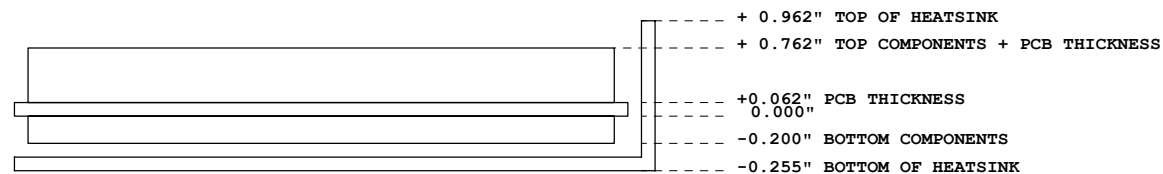
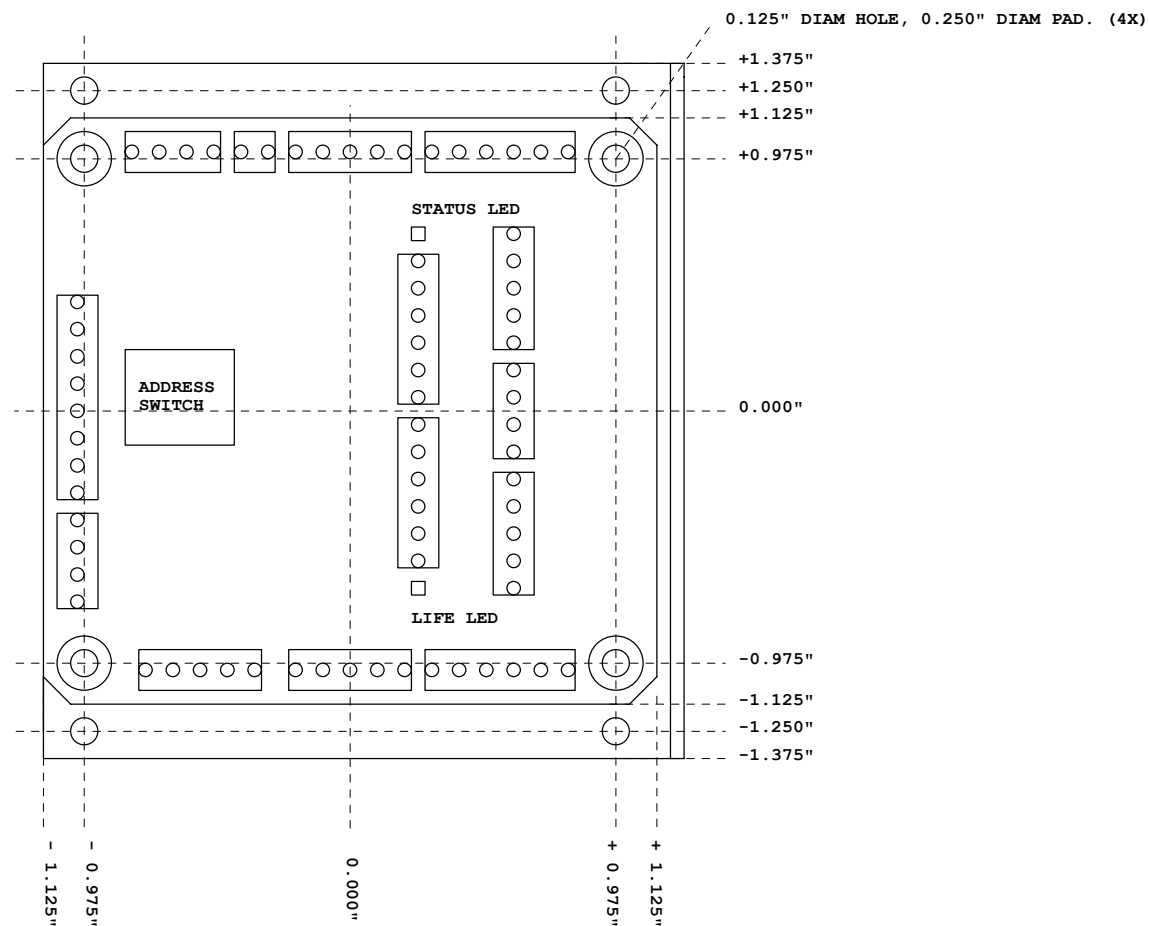


ENHANCED EXTERNAL CIRCUIT FOR > 10BIT ACCURACY

WIRING DIAGRAM ANALOG INPUT OR POTENTIOMETER FEEDBACK

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48V CONTROLLER DRIVER DIMENSIONAL INFORMATION

48 VOLT DRIVER CONTROLLER

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