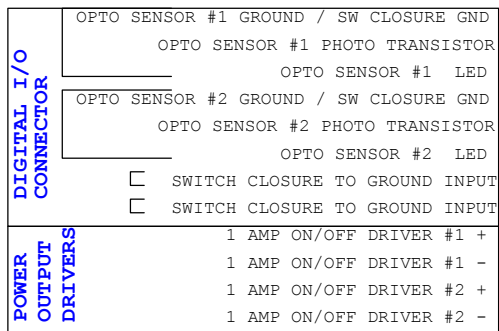




**DO NOT
UNPLUG LOADS
WHILE POWER
IS ON**

**USB
CONNECTION**

**POWER INPUT
AND RS485
COMMUNICATION**

+9V TO +30V
GROUND
RS485 B
RS485 A

USB

**ADDRESS
SWITCH**

ENCODER1

GROUND
INDEX
CHAN A
+5V
CHAN B

**MOTOR1
LIMITS**

MOTOR1 UPPER LIMIT POWER
MOTOR1 UPPER LIMIT IN
GROUND
MOTOR1 LOWER LIMIT POWER
MOTOR1 LOWER LIMIT IN
GROUND

☐ **STATUS LED**

MOTOR2 UPR LIM PWR
MOTOR2 UPPER LIM IN
GROUND
MOTOR2 LWR LIM PWR
MOTOR2 LOWER LIM IN
GROUND

☐ **LIFE LED**

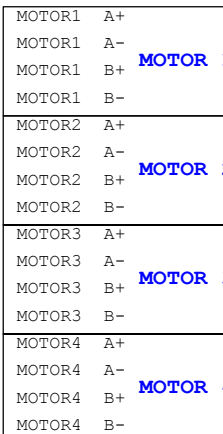
MOTOR3 UPR LIM PWR
MOTOR3 UPPER LIM IN
GROUND
MOTOR3 LWR LIM PWR
MOTOR3 LOWER LIM IN
GROUND

ENCODER2

CHAN B
+5V
CHAN A
INDEX
GROUND

MOTOR4 LOWER LIMIT IN
MOTOR4 LOWER LIMIT POWER
GROUND
MOTOR4 UPPER LIMIT IN
MOTOR4 UPPER LIMIT POWER

**MOTOR4
LIMITS**



**DO NOT
UNPLUG LOADS
WHILE POWER
IS ON**

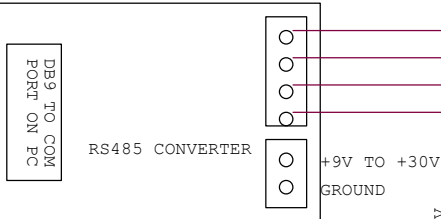
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EZ 4AXIS DRIVER CONTROLLER

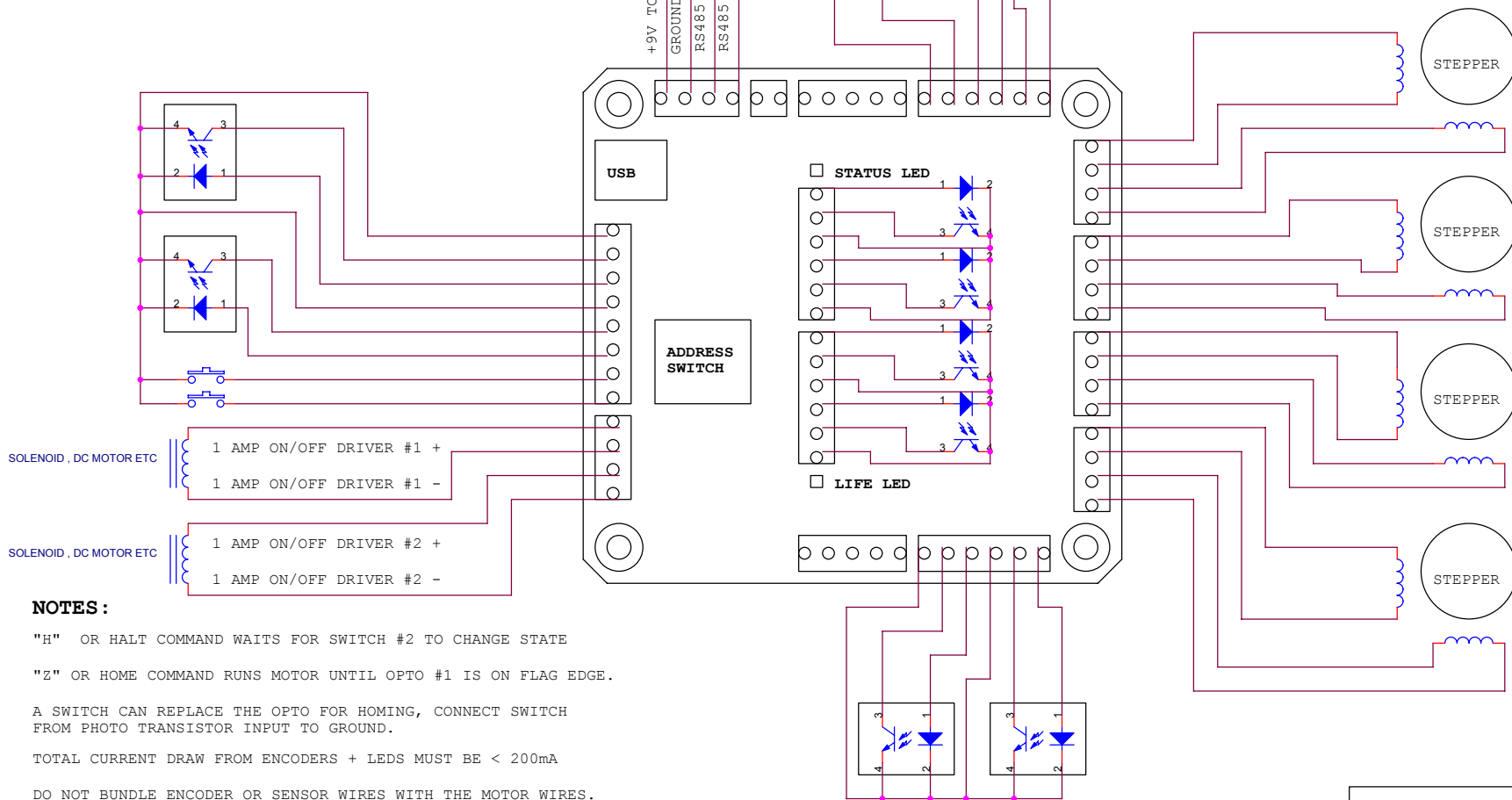
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TO PC COM PORT
USE 9600 BAUD
8BIT, NO PARITY,
1 STOP, NO FLOW
CTRL.



TO OTHER
EZ STEPPERS



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

4 AXIS STEPPER DRIVER CONTROLLER WITH DUAL ENCODERS

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EZ 4 AXIS DRIVER CONTROLLER ACESSORIES 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

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

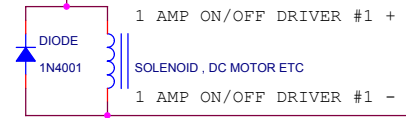
1) ON/OFF DRIVERS RATED AT 2 AMPS PEAK, 1 AMP CONTINUOUS.

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

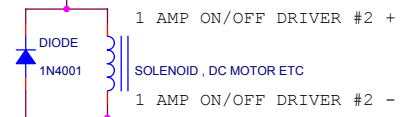
3) EXTERNAL DIODE IS NOT NECESSARY IF BOTH SIDES OF LOAD ARE WIRED BACK TO THE EZ STEPPER.

ON/OFF DRIVERS ALTERNATE WIRING DIAGRAM

EXTERNAL +VE SUPPLY



EXTERNAL +VE SUPPLY



EXTERNAL SUPPLY VOLTAGE
MUST BE LESS THAN SUPPLY
TO EZ STEPPER

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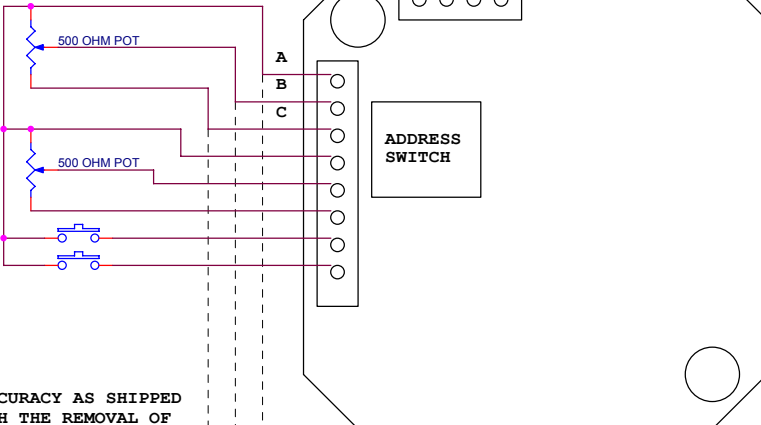
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FEEDBACK POT1 GROUND
FEEDBACK POT1 WIPER
FEEDBACK POT1 POWER

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

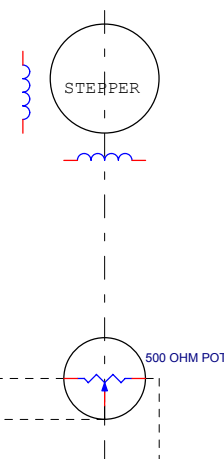
SWITCH #1 CLOSURE TO GROUND INPUT
SWITCH #2 CLOSURE TO GROUND INPUT

SIMPLE CIRCUIT,
7 BIT ACCURACY

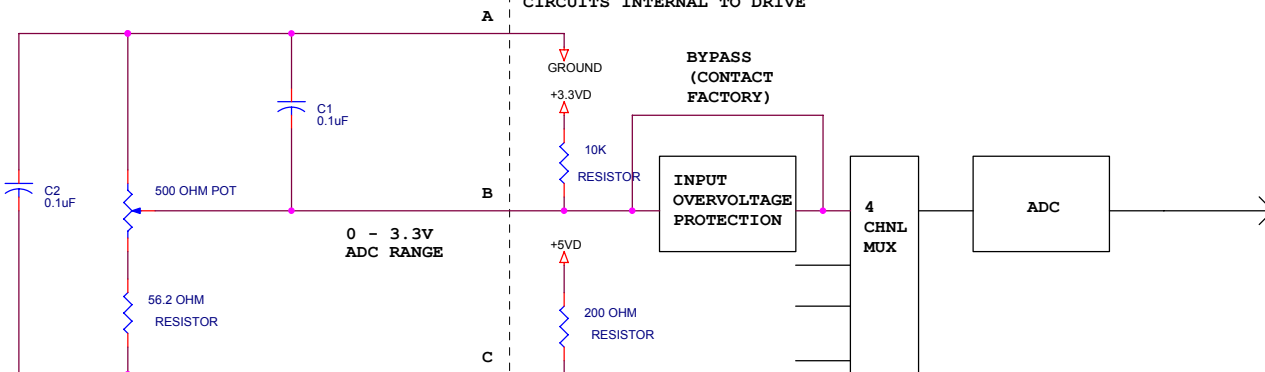


NOTES:

- 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

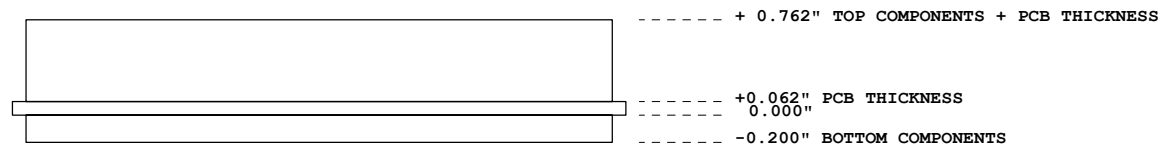
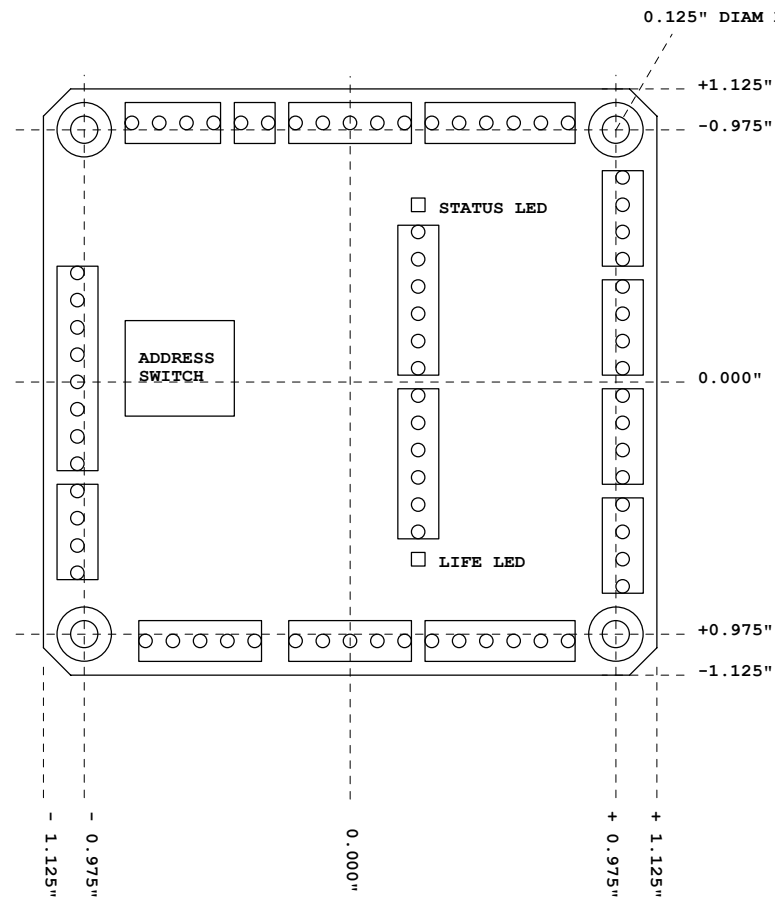


ENHANCED EXTERNAL CIRCUIT FOR > 10BIT ACCURACY

WIRING DIAGRAM ANALOG INPUT OR POTENTIOMETER FEEDBACK

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