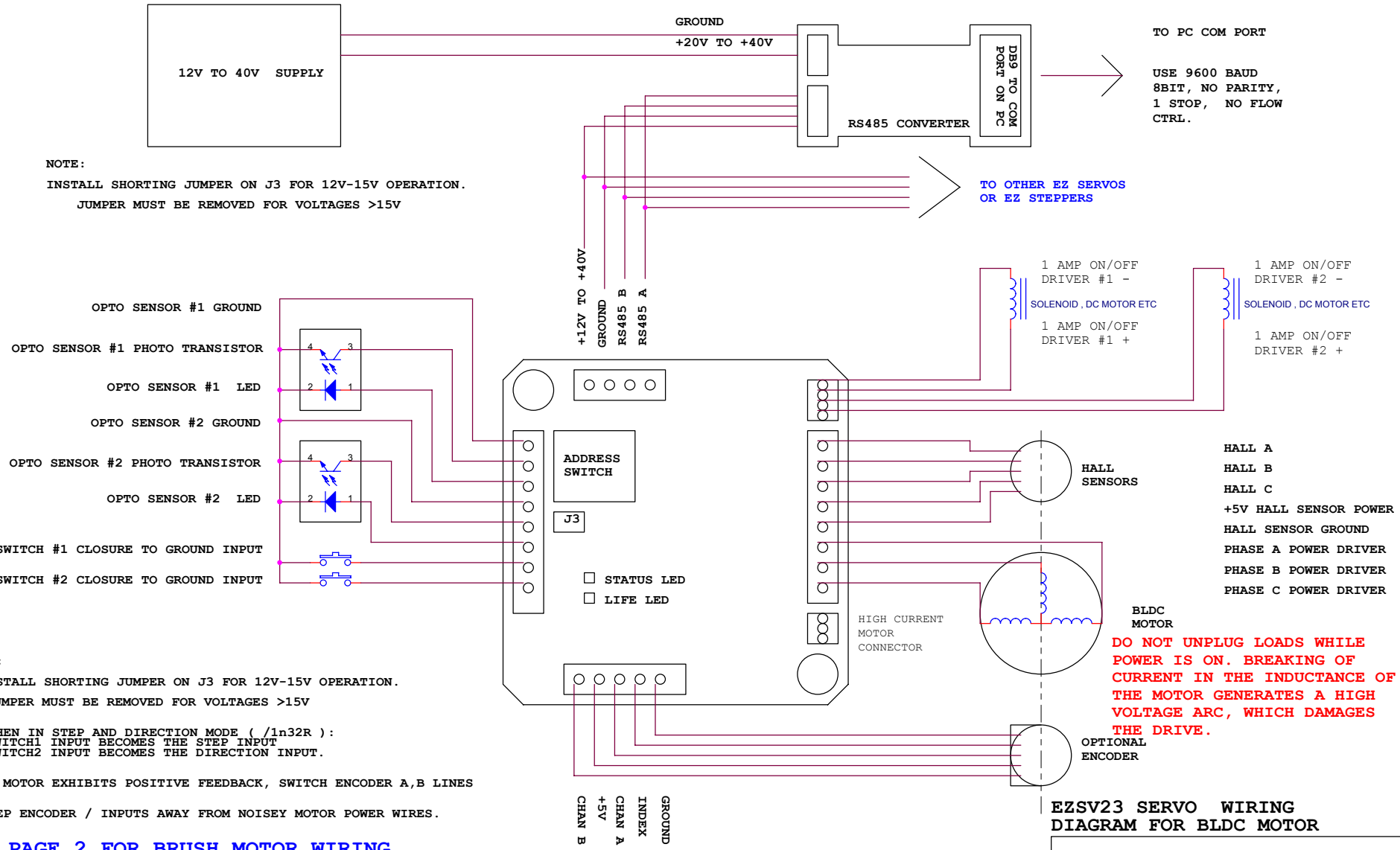

NOTES:

1) INSTALL SHORTING JUMPER ON J3 FOR 12V-15V OPERATION.
   JUMPER MUST BE REMOVED FOR VOLTAGES >15V

2) WHEN IN STEP AND DIRECTION MODE (/1n32R):
   SWITCH1 INPUT BECOMES THE STEP INPUT
   SWITCH2 INPUT BECOMES THE DIRECTION INPUT.

3) IF MOTOR EXHIBITS POSITIVE FEEDBACK, SWITCH ENCODER A,B LINES

4) KEEP ENCODER / INPUTS AWAY FROM NOISEY MOTOR POWER WIRES.

SEE PAGE 2 FOR BRUSH MOTOR WIRING

SEE PAGE 3 FOR MANUFACTURER SPECIFIC BLDC MOTOR WIRING EXAMPLES

EZSV23 SERVO WIRING DIAGRAM FOR BLDC MOTOR

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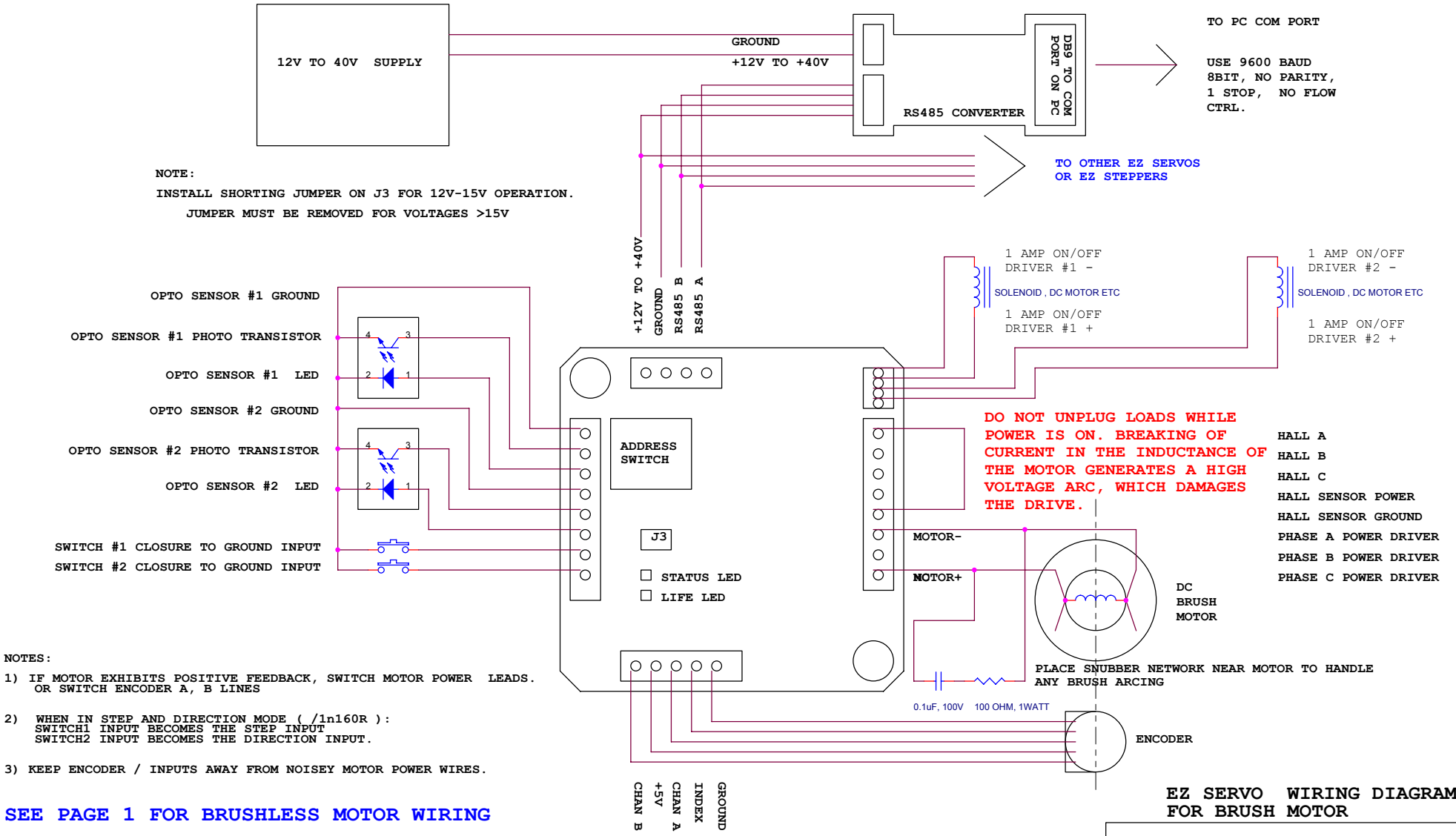

NOTES:

1) IF MOTOR EXHIBITS POSITIVE FEEDBACK, SWITCH MOTOR POWER LEADS. OR SWITCH ENCODER A, B LINES

2) WHEN IN STEP AND DIRECTION MODE (/1n160R):
SWITCH1 INPUT BECOMES THE STEP INPUT
SWITCH2 INPUT BECOMES THE DIRECTION INPUT.

3) KEEP ENCODER / INPUTS AWAY FROM NOISEY MOTOR POWER WIRES.

SEE PAGE 1 FOR BRUSHLESS MOTOR WIRING

SEE PAGE 3 FOR MANUFACTURER SPECIFIC BLDC MOTOR WIRING EXAMPLES

NOTE: ENCODER SIGNALS MUST BE >4.5V HIGH LEVEL. THIS MAY REQUIRE EXTERNAL PULLUPS.

EZ SERVO WIRING DIAGRAM FOR BRUSH MOTOR

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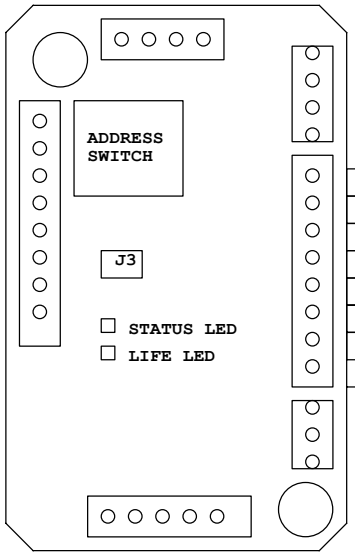
POWER INPUT AND COMMUNICATION

+12V TO +40V POWER SUPPLY
GROUND
RS485 B
RS485 A

On/Off Drivers deliver same voltage as input voltage.

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



ENCODER CONNECTION

NOTE: MOTORS WITHOUT ENCODERS CAN BE RUN IN THE "N0" VELOCITY MODE, OR FOR FINER CONTROL THEY CAN BE RUN IN "N1" MODE WITH TWO OF THE HALL SENSOR LINES WIRED TO THE ENCODER CHANNELS A AND B TO ACT AS A ROUGH POSITION ENCODER. THIS WILL ALLOW FINE ACCELERATION CONTROL, OR ROUGH POSITION CONTROL. THE VELOCITY WILL NEED TO BE SET LOW. TRY /1L1V10000R, ENSURE THAT THE ENCODER IS HOOKED UP TO COUNT UP WHEN THE MOTOR MOVES IN THE POSITIVE DIRECTION.

POPULAR MANUFACTURER WIRE COLORS

	PITTMAN	MAXON	MAXON	EAD OPTICAL HALL	EAD MAGNETIC HALL	FAULHARBER	ANAHEIM AUTOMATION	HARMONIC DRIVES RSF8B	PORTESCAP NUVODISC 32BF	MAXON EC-max
HALL A	WHITE	BLUE	RED/GREY	BROWN	YELLOW	GREEN	WHITE	YELLOW	SENSOR1	GREY
HALL B	GREY	GREY	WHITE/GREY	WHITE	GREEN	BLUE	BLUE	BROWN	SENSOR3	BROWN
HALL C	BLUE	VIOLET	BLACK/GREY	GREEN	GREY	GREY	GREEN	RED	SENSOR2	YELLOW
+5V HALL SENSOR POWER	PURPLE	YELLOW	GREEN	NC	ORANGE	RED	RED	WHITE (PINK)	VDD	GREEN
HALL SENSOR GROUND	BLACK	GREEN	BLUE	NC	BLACK	BLACK	BLACK	BLACK	GROUND	BLUE
PHASE A POWER DRIVER	BROWN	ORANGE	WHITE	BROWN	BROWN	BROWN	BLACK (M)	BLACK (M)	PHASE 3	BLACK
PHASE B POWER DRIVER	RED	RED	BLACK	WHITE	WHITE	ORANGE	YELLOW (M)	RED (M)	PHASE 2	RED
PHASE C POWER DRIVER	ORANGE	BROWN	RED	BLUE	BLUE	YELLOW	RED (M)	WHITE (M)	PHASE 1	WHITE

PHASE A POWER DRIVER HIGH CURRENT SCREW TERMINAL
PHASE B POWER DRIVER HIGH CURRENT SCREW TERMINAL
PHASE C POWER DRIVER HIGH CURRENT SCREW TERMINAL
Use screw terminal if > 3 Amp Current

FROM OPTICAL ENCODER + HALL

GROUND	BLACK
INDEX	ORANGE
CHAN A	YELLOW
+5V	RED
CHAN B	BLUE

DO NOT CONNECT
ORANGE
BLUE
GREEN

NOTE: ENCODER SIGNALS MUST BE >4.5V HIGH LEVEL.
THIS MAY REQUIRE EXTERNAL PULLUPS.

SIZE: 2.25" X 2.25" x 1.00" THICK

PLEASE NOTE: FOR OTHER MOTORS, ALLMOTION WILL BE PLEASED TO WORK OUT THE WIRING FOR NO CHARGE.

EZSV23 SERVO WIRING DIAGRAM

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EZSV23 ACESSORIES AND OTHER ELECTRICAL NOTES

MATING CONNECTORS:

AMP MTA 100 SERIES

4PIN 22 GA DIGIKEY P/N A31108 (INPUT CONNECTOR)

8PIN 22 GA DIGIKEY P/N A31111 (NEMA23 MOTOR)

8PIN 24 GA DIGIKEY P/N A31023 (NEMA17 MOTOR)

8PIN 26 GA DIGIKEY P/N A31030 (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

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 Ic > 1mA @ IF = 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 200 OHM TO 5V IN SERIES ON THE BOARD. THE 200 OHM CAN BE REMOVED IF DESIRED FOR RUNNING SENSORS THAT REQUIRE DIRECT ACESS TO 5V. (OR USE ENCODER 5V POWER) THE COLLECTOR OF THE TRANSISTOR HAS A 10K PULLUP TO 5V. THE TOTAL CURRENT DRAWN FROM THE 5V SUPPLY (INCLUDING OPTOS) MUST BE LESS THAN 200mA.

6) ALL INPUTS ARE 0-3.3V ADC INPUTS, THE ONE/ZERO THRESHOLD IS FACTORY SET TO 1.23V, TO BE TTL COMPATIBLE, AND CAN BE CHANGED BY SOFTWARE COMMAND.

ENCODERLESS OPERATION:

1) THE EZSERVO CAN PERFORM VELOCITY MODE CONTROL OF A MOTOR THAT DOES NOT HAVE AN ENCODER BY USING THE HALL SENSORS AS A GAGE OF SPEED. (N=0 MODE)

2) IT IS POSSIBLE TO USE THE N=1 POSITION CONTROL MODE BY WIRING TWO OF THE HALL SENSOR LINES TO THE ENCODER A AND B INPUTS IN ADDITION. THIS ALLOWS A CRUDE POSITION CONTROL MODE. IN THIS MODE THE VELOCITY CONTROL IS SUPERIOR TO THE N=0 MODE. USE SMALL ACCELEARTIONS AND VELOCITIES IN THIS MODE. Eg TRY /1L1V10000P0R

3) THE RESPONSE CAN ALSO BE "STIFFENED" BY INCREASING THE PID GAIN CONSTANTS eg /1L10w3000y3000V10000P0R

4) IF WIRING HALL SENSORS AS ENCODERS , USE THE ENCODER 5 V TO POWER THE HALL SENSORS.

MOTORS:

1) THE EZ SERVO WILL DRIVE MOST SERVO MOTORS

2) FOR BEST PERFORMANCE SELECT A MOTOR THAT HAS A BACK EMF OF ABOUT 1/2 OF THE SUPPLY VOLTAGE, AT THE MAX SPEED DESIRED TO RUN AT. (Eg USE A 12V MOTOR WITH A 24V SUPPLY).

3) TYPICALLY A MOTOR THAT HAS AN INDUCTANCE OF AROUND 1mH AND A RESISTANCE OF AROUND 1 OHM WORKS WELL. BUT OTHER VALUES ARE ALSO OK. (0.1mH MINIMUM)

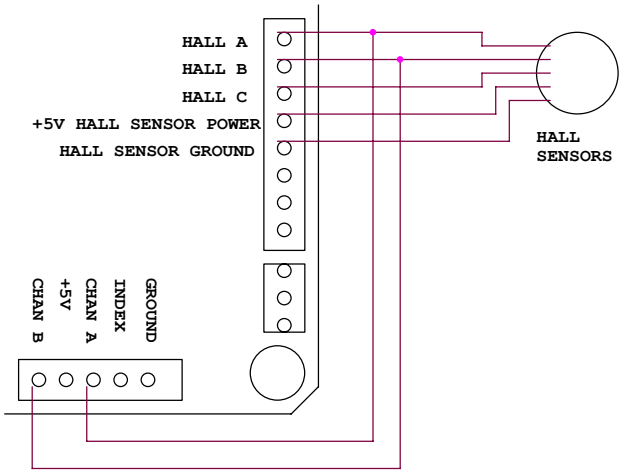
ON/OFF DRIVERS ALTERNATE WIRING DIAGRAM

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

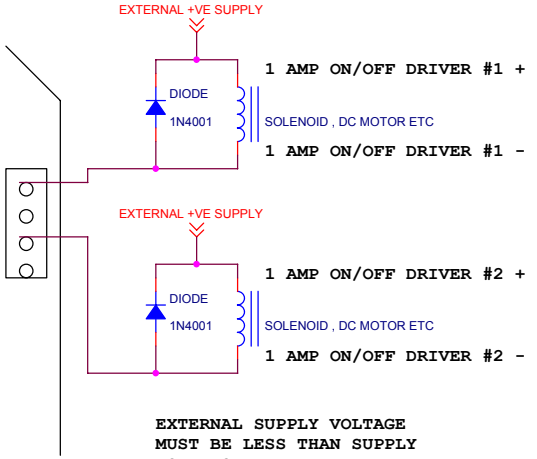
2) THE NEGATIVE PIN OF THESE DRIVERS IS ACTUALLY AN OPEN COLLECTOR TYPE OUTPUT THAT PULLS DOWN TO GROUND. IT IS POSSIBLE TO DRIVE LOADS THAT ARE OF A DIFFERENT VOLTAGE THAN THE SUPPLY VOLTAGE, BY CONNECTING THE POSITIVE SIDE OF THE LOAD TO AN EXTERNAL SUPPLY, AND THE NEGATIVE SIDE TO THE -VE OUTPUT PIN. 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.

USE OF HALL SENSORS AS ENCODERS



ON/OFF DRIVERS ALTERNATE WIRING DIAGRAM



EXTERNAL SUPPLY VOLTAGE MUST BE LESS THAN SUPPLY TO EZ STEPPER

SEE NEXT PAGE FOR DIMENSIONAL INFO

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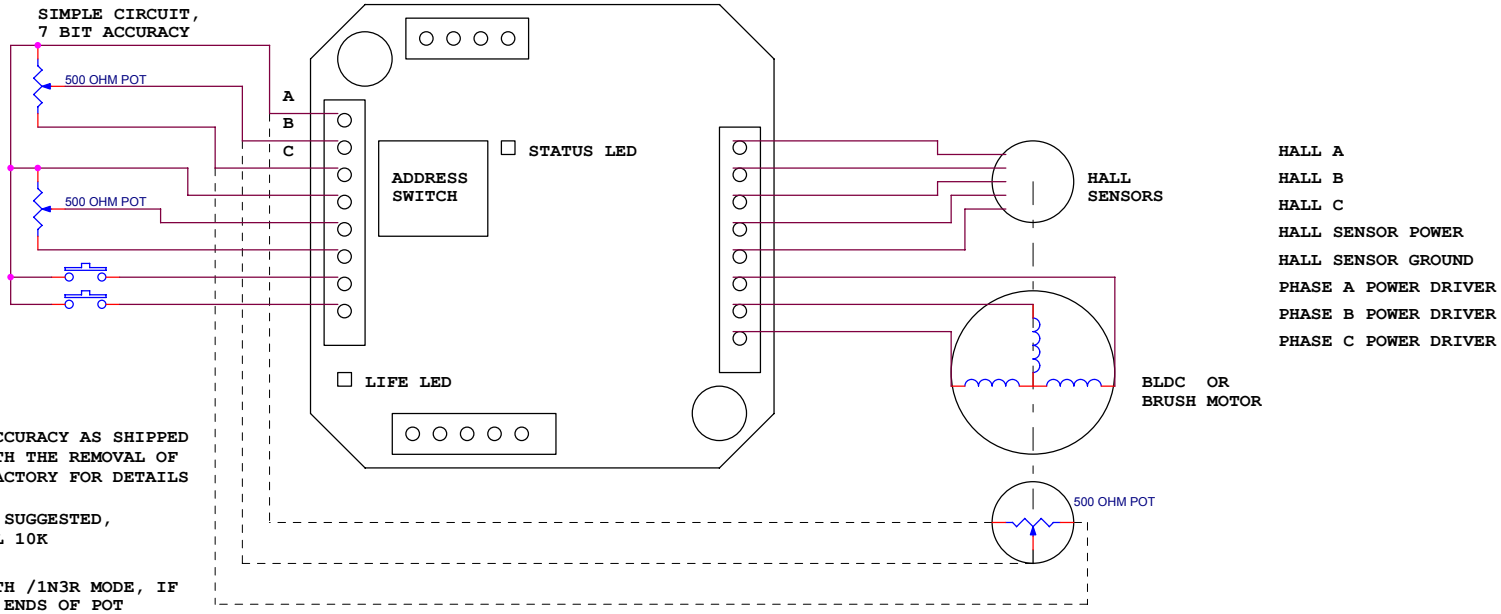


NOTES:

1) ALL 4 INPUTS ARE ANALOG INPUTS

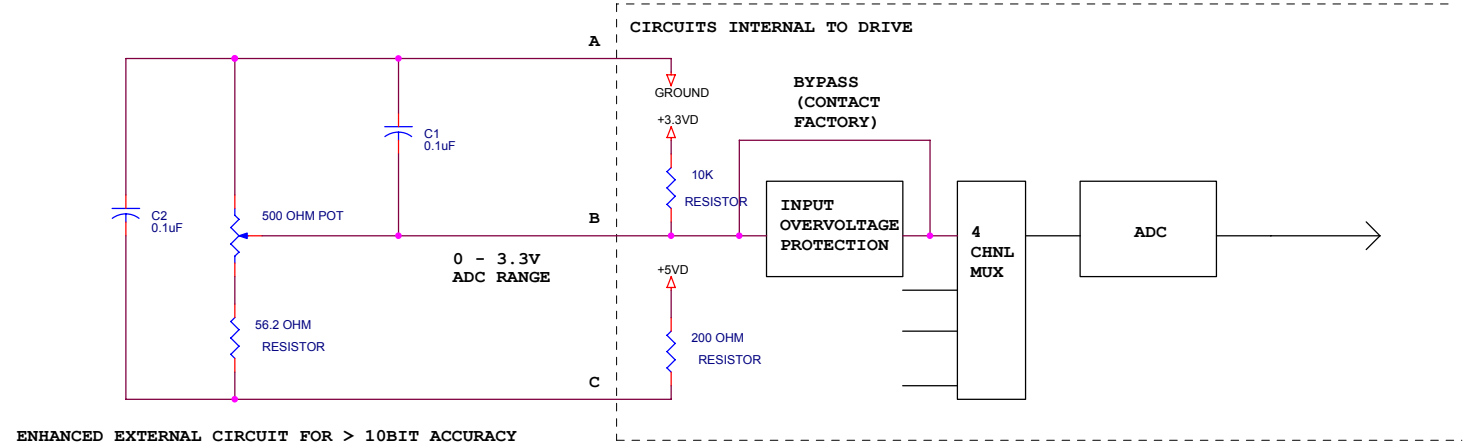
2) ADC's VALUES RANGE FROM 0-16368. THE ACCURACY AS SHIPPED IS 7 BIT BUT CAN BE IMPROVED TO >10BIT WITH THE REMOVAL OF THE INPUT PROTECTION CIRCUITRY, CONTACT FACTORY FOR DETAILS

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.



ENHANCED EXTERNAL CIRCUIT FOR > 10BIT ACCURACY

WIRING DIAGRAM ANALOG INPUT OR POTENTIOMETER FEEDBACK

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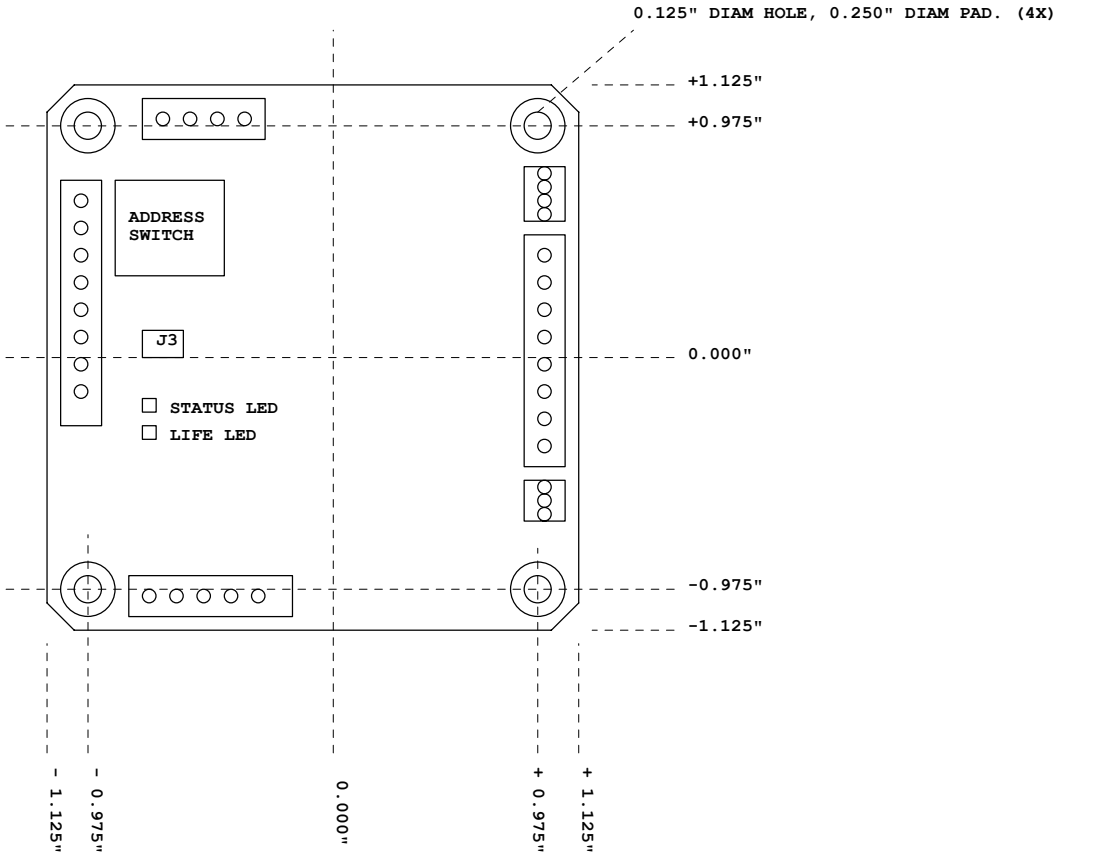

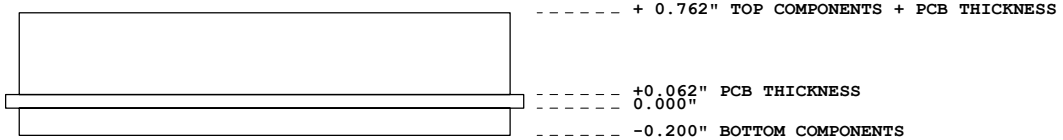

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