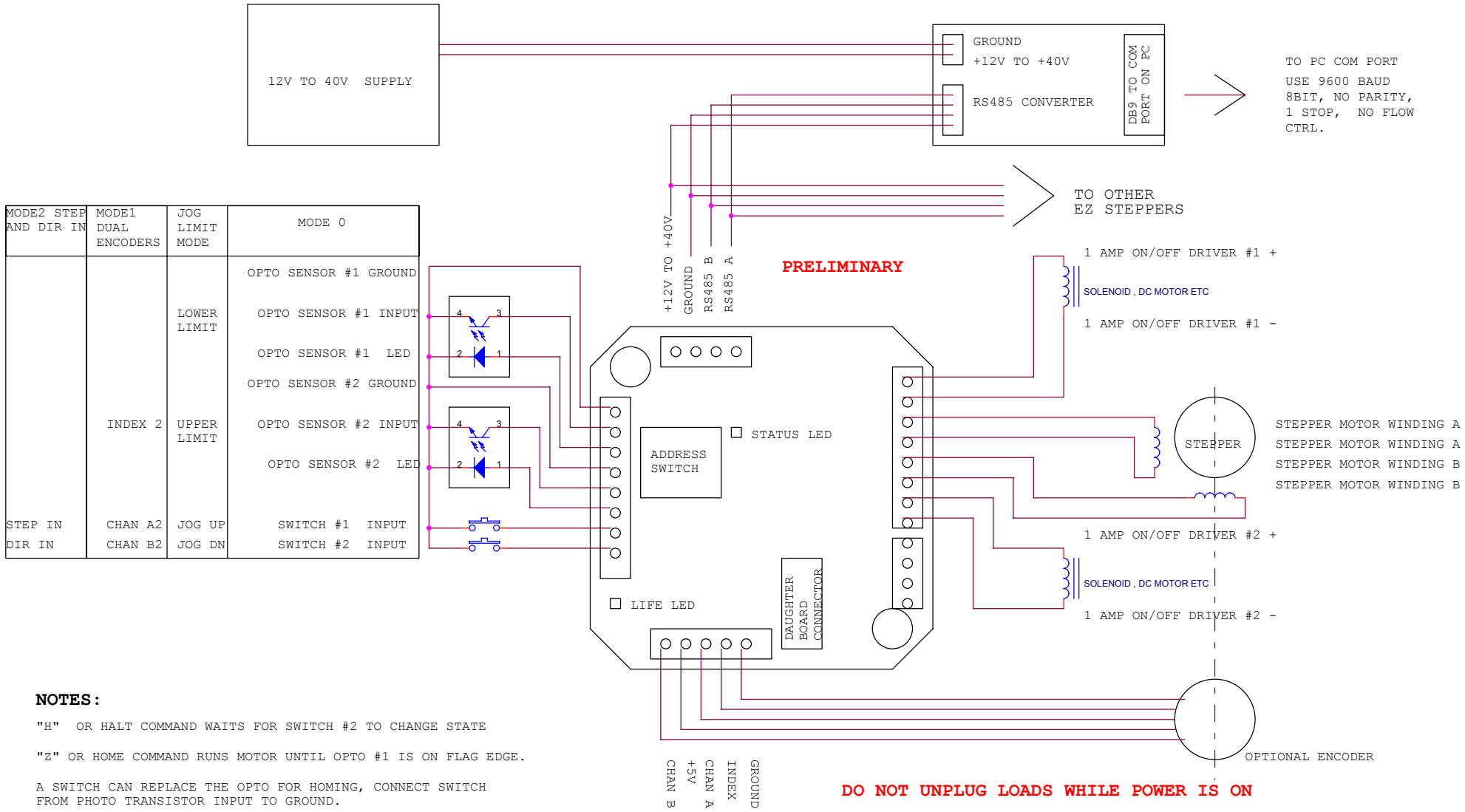

MODE2 STEP AND DIR IN	MODE1 DUAL ENCODERS	JOG LIMIT MODE	MODE 0
			OPTO SENSOR #1 GROUND
		LOWER LIMIT	OPTO SENSOR #1 INPUT
			OPTO SENSOR #1 LED
			OPTO SENSOR #2 GROUND
	INDEX 2	UPPER LIMIT	OPTO SENSOR #2 INPUT
			OPTO SENSOR #2 LED
STEP IN	CHAN A2	JOG UP	SWITCH #1 INPUT
DIR IN	CHAN B2	JOG DN	SWITCH #2 INPUT

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

SEE PAGE 2 FOR WIRING DETAILS
SEE PAGE 3 FOR ACESSORIES
SEE PAGE 4 FOR ADC INTERFACE
SEE PAGE 5 FOR DIMENSIONAL INFO

EZHR23ENHC

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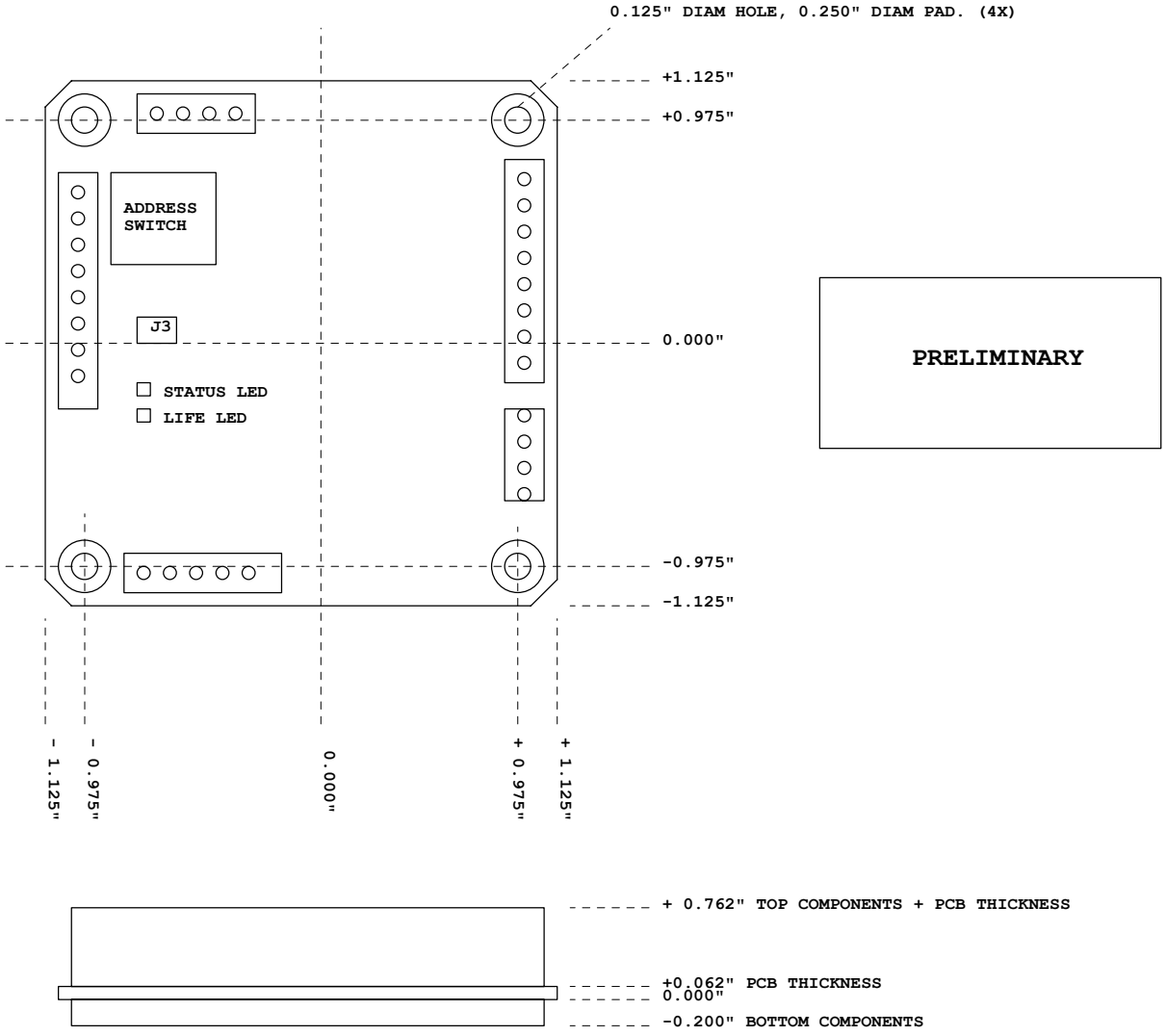

PRELIMINARY

EZHR2323ENHC DRIVE DIMENSIONAL INFORMATION

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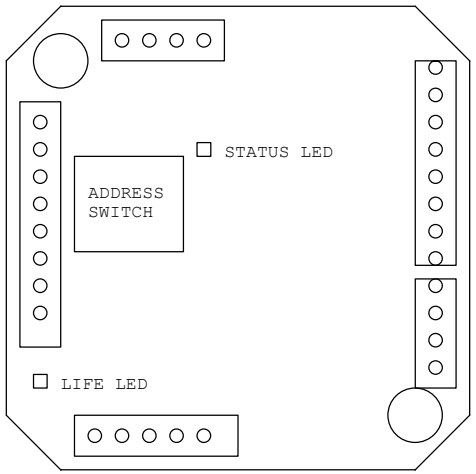
MODE2 STEP AND DIR IN	MODE1 DUAL ENCODERS	JOG LIMIT MODE	MODE 0 STANDARD MODE
			DIGITAL I/O CONNECTOR
		LOWER LIMIT	OPTO SENSOR #1 GROUND / SW CLOSURE GND
			OPTO SENSOR #1 PHOTO TRANSISTOR
			OPTO SENSOR #1 LED
	INDEX 2	UPPER LIMIT	OPTO SENSOR #2 GROUND / SW CLOSURE GND
			OPTO SENSOR #2 PHOTO TRANSISTOR
			OPTO SENSOR #2 LED
STEP IN	CHAN A2	JOG UP	SWITCH CLOSURE TO GROUND INPUT
DIR IN	CHAN B2	JOG DN	SWITCH CLOSURE TO GROUND INPUT

4 SWITCH CLOSURE, OR 2 OPTO AND 2 SWITCH CLOSURE INPUTS



POWER OUTPUT DRIVERS

1 AMP ON/OFF DRIVER #1 +
1 AMP ON/OFF DRIVER #1 -
STEPPER MOTOR WINDING A
STEPPER MOTOR WINDING A
STEPPER MOTOR WINDING B
STEPPER MOTOR WINDING B
1 AMP ON/OFF DRIVER #2 +
1 AMP ON/OFF DRIVER #2 -

2 AMP PEAK BIPOLAR STEPPER DRIVE, AND 2 AMP PEAK ON/OFF DRIVERS FOR RELAYS, DC MOTORS, SOLENOIDS ETC.

HIGH CURRENT SCREW TERMINAL FOR STEPPER WINDING A
HIGH CURRENT SCREW TERMINAL FOR STEPPER WINDING A
HIGH CURRENT SCREW TERMINAL FOR STEPPER WINDING B
HIGH CURRENT SCREW TERMINAL FOR STEPPER WINDING B

USE HIGH CURRENT SCREW TERMINAL ABOVE 4AMPS

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EZHR23ENHC ACESSORIES AND OTHER ELECTRICAL NOTES

MATING CONNECTORS:

AMP MTA 100 SERIES

4PIN 22 GA DIGIKEY P/N A23849 (INPUT CONNECTOR)

8PIN 22 GA DIGIKEY P/N A23841 (NEMA23 MOTOR)

8PIN 24 GA DIGIKEY P/N A23820 (NEMA17 MOTOR)

8PIN 26 GA DIGIKEY P/N A23799 (FOR OPTOS)

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 271-1112

DIGIKEY P/N Z1158 (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 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 150 OHM TO 5V IN SERIES ON THE BOARD. THE 150 OHM CAN BE REMOVED IF DESIRED FOR RUNNING SENSORS THAT REQUIRE DIRECT ACESS TO 5V. THE COLLECTOR OF THE TRANSISTOR HAS A 10K PULLUP TO 5V.

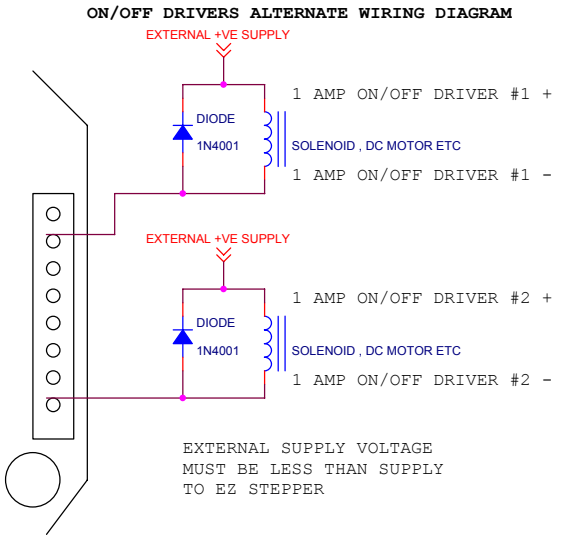
6) ALL INPUTS WORK ON TTL LEVEL SIGNALS

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.



SEE NEXT PAGE FOR DIMENSIONAL INFO

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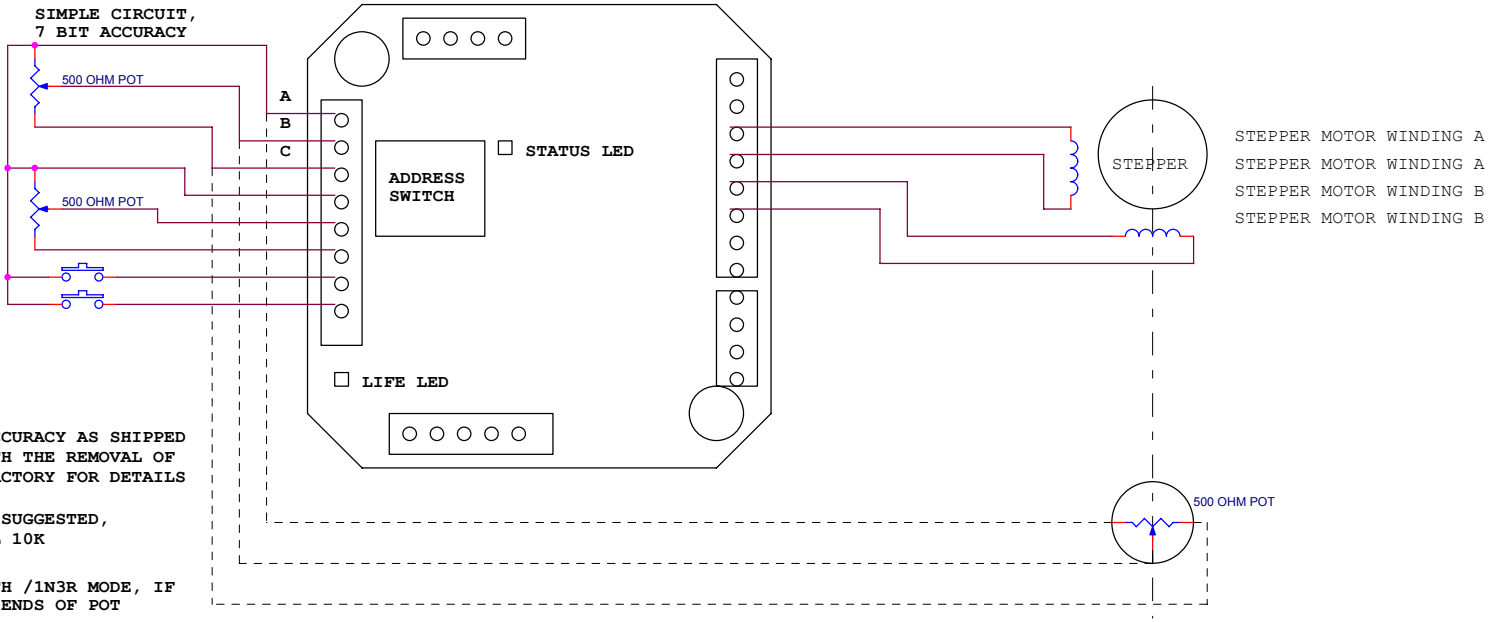


NOTES:

1) ALL 4 INPUTS ARE ANALOG INPUTS

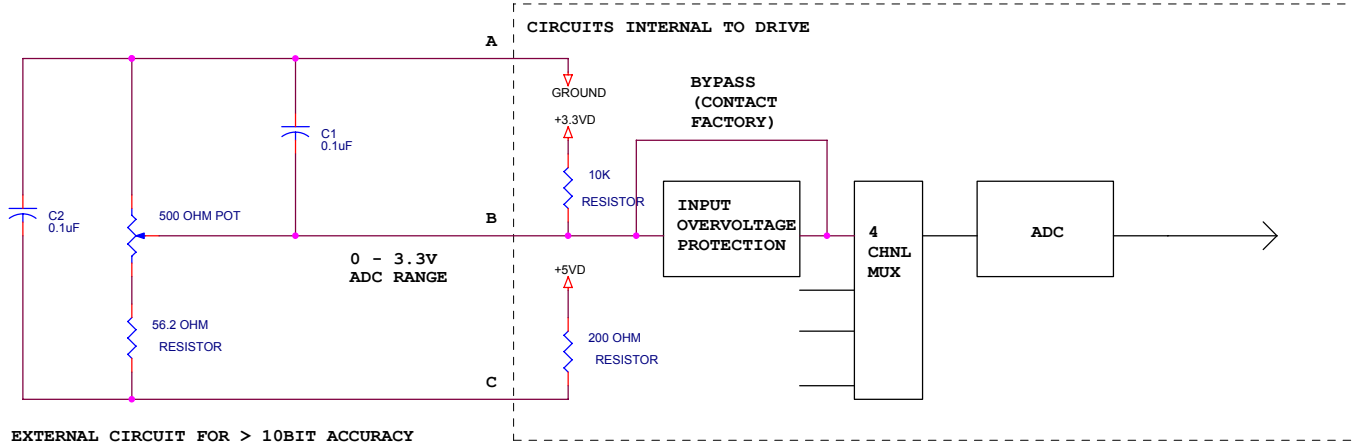
2) ADC's VALUES RANGE FROM 0-16368. THE ACCURACY AS SHIPPED IS 7 BIT BUT CAN BE IMPROVED TO >10BIT WITH THE REMOVAL OF THE INPUT PROTECTION CIRCUITRY, CONTACT FACTORY FOR DETAILS

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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