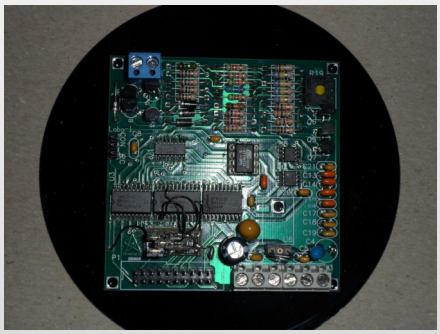
BROWNS BRAIN

THERE'S NOTHING SMARTER THAN A BRAIN!

DC MOTOR \ ENCODER CONTROLLER

B B 0 0 8



This new product from Browns Brain is an inexpensive DC motor control board. It has both, the common parallel control/data interface as well as an I2C serial interface. It can control small DC motors up to 500 mA. (Higher values on special order.) It is easily interfaced to any micro-controller of any size.

What makes this motor controller different is that it is intended to be used with a resistive encoder. Any variable resistor can be used as an inexpensive encoder. Simply have a potentiometer turn with the shaft of a motor and you now have the ability to read back the position of the motor shaft, in up to 12 bits of resolution.

The unit comes configured for 8 bits and is intended to be used with a maximum resistance of 500 K ohm but smaller values may be used. It is designed to give binary data of :

0000 ***0000 0001*** for every ***1.961 K ohm*** of encoder resistance. This is equivalent to a resolution of ***1.06 degrees / bit***, across a span of 270 degrees. Or 1.41 deg. per bit across 360 degrees. The encoder does not lose it's value with the loss of power - if power is lost, once reapplied, the board will report the same encoder data as before power was lost, unless the encoder was moved. Also, readings are linear unless a non linear variable resistance is used.

This board can be used for other applications since it will read any resistor based sensor and has a plus-minus analog output.

- ** 1.961K ohm per bit*
- ** 1.06 deg./bit*
- ** Absolute encoder*
- ** Resistive Encoder*
- ** 8 bit or 12 bit versions*
- *Linear or non linear*
- ** I2C interface*
- *Up to 8 boards on the same I2C bus*
- ** Parallel interface*
- ** 600mW drive for any DC motor*
- ** Forward & Reverse*
- ** Stop & Go*
- *Over Current Protection*
- *Can be used with the Raspberry Pi*

www.brownsbrain.com
Email:sales@brownsbrain.com

BROWNS BRAIN

THERE'S NOTHING SMARTER THAN A BRAIN!

Specifications	Minimum	Maximum
V_{Logic}	7 V	15 V
V_{Motor} (P_{max} = 600 mW)	1.5 V	28 V
$R_{Encoder}$	1900 ohm	500 000 ohm

NOTE: Grounds are common.

Encoder Maximum Resistance (KΩ)	Range of Encoder Travel = 270 degrees			
	Resolution		Conversion Time (mS)	
	8 bit (Ω/bit) (1.059'/bit)	12 bit (Ω/bit) (0.066'/bit)	8 bit	12 bit
2	7.8	0.5	0.12	1.74
3	11.7	0.7	0.17	2.74
5	19.5	1.2	0.29	4.57
10	39.1	2.4	0.58	9.13
20	78.1	4.9	1.17	18.26
50	195.3	12.2	2.92	45.65
100	390.6	24.4	5.83	91.3
200	781.3	48.8	11.66	182.6
500	1.961 K	122.1	29.15	456.5

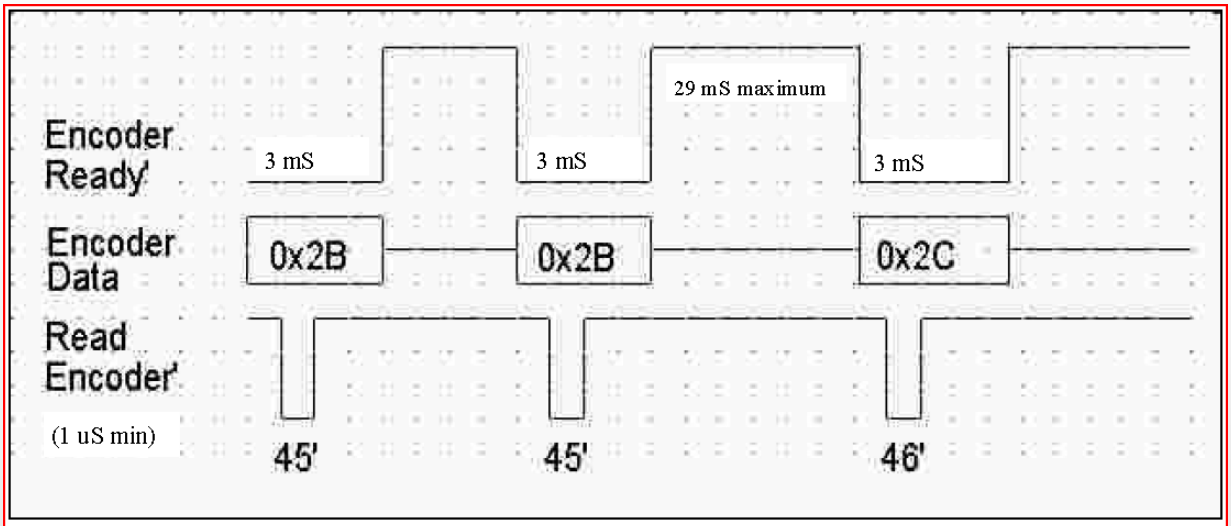
* If the encoder potentiometer covers 270 degrees, then for 8 bit readings there will be 1.06 degrees per bit.

Encoder Maximum Resistance (KΩ)	Range of Encoder Travel = 360 degrees			
	Resolution		Conversion Time (mS)	
	8 bit (Ω/bit) (1.41'/bit)	12 bit (Ω/bit) (0.088'/bit)	8 bit	12 bit
2	7.8	0.5	0.12	1.74
3	11.7	0.7	0.17	2.74
5	19.5	1.2	0.29	4.57
10	39.1	2.4	0.58	9.13
20	78.1	4.9	1.17	18.26
50	195.3	12.2	2.92	45.65
100	390.6	24.4	5.83	91.3
200	781.3	48.8	11.66	182.6
500	1.961 K	122.1	29.15	456.5

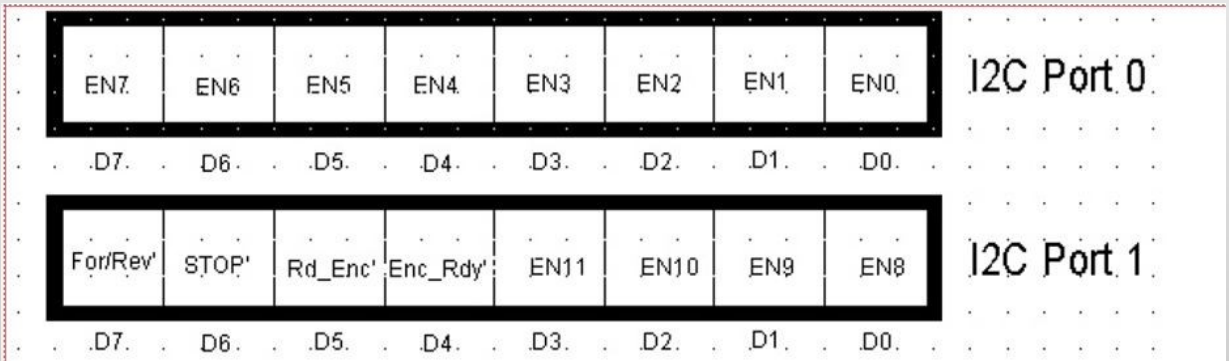
* If the encoder potentiometer covers 360 degrees, then for 8 bit readings there will be 1.41 degrees per bit.

BROWNS BRAIN

THERE'S NOTHING SMARTER THAN A BRAIN!



Timing diagram for parallel data interface.



I2C Interface Registers

EN0—EN11	- encoder data
Enc_Rdy'	- encoder ready signal, active low; set Rd_Enc' line low while reading encoder data bits (3 mS active)
Rd_Enc'	- active low, set low while reading encoder data bits (1 uS min)
STOP'	- active low, low level stops motor, high level starts motor
For/Rev'	- high level sets forward direction, low level sets reverse direction

Steps to read encoder:

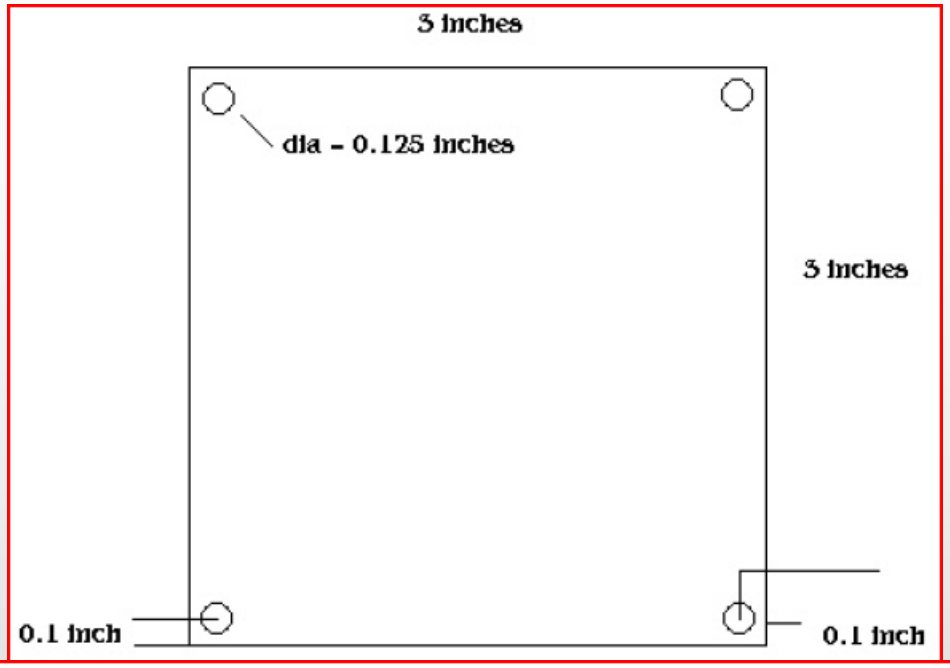
1. Set Rd_Enc' low
2. Do a 16 bit read. If Enc_Rdy' bit is low then encoder value is valid, otherwise do another read.

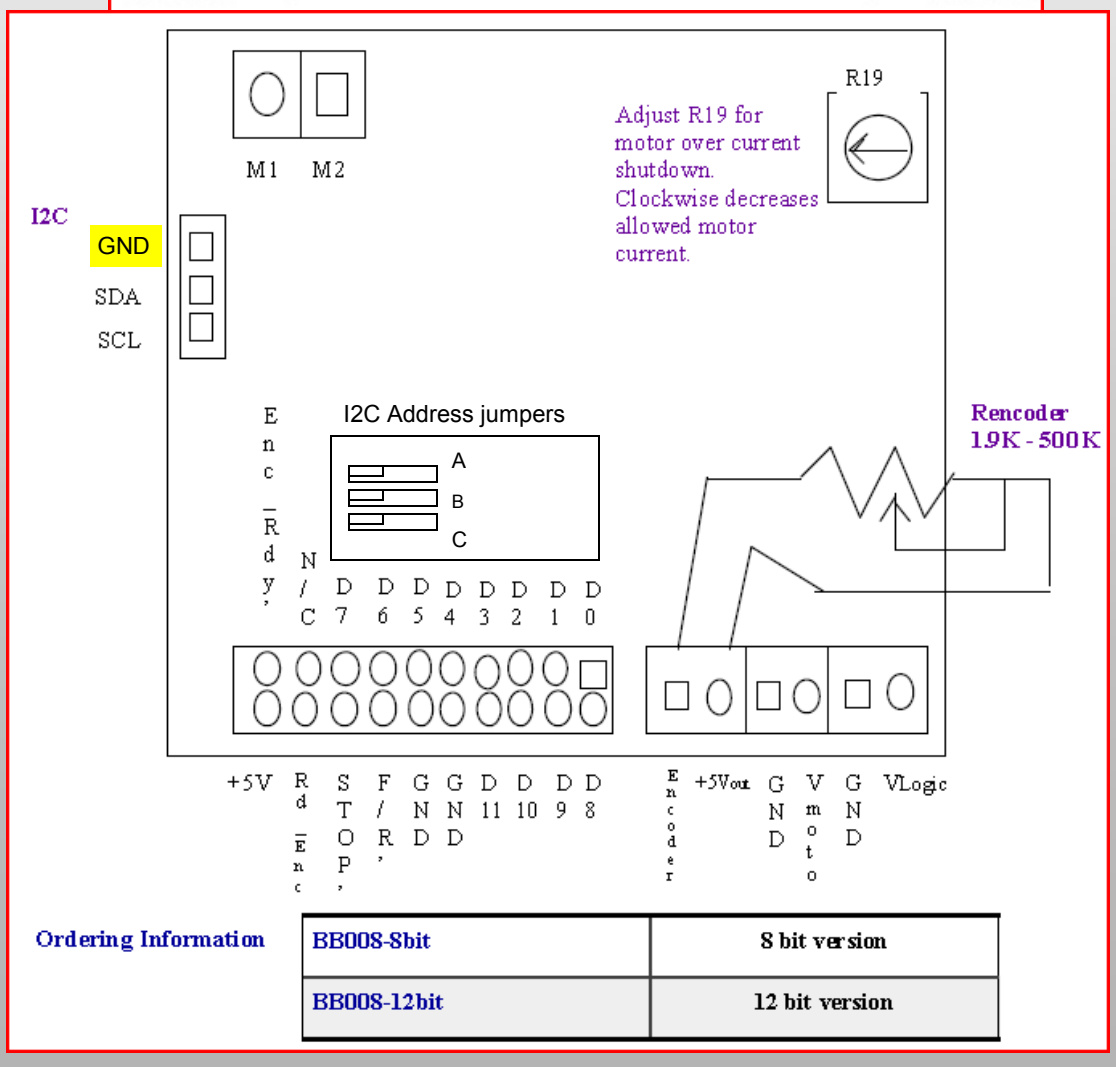
Setting I2C Address Jumpers:

Address	Jumper (1=on,0=OFF)
0x20	A=0; B=0; C=0
0x21	A=1; B=0; C=0
0x22	A=0; B=1; C=0
0x23	A=1; B=1; C=0
0x24	A=0; B=0; C=1
0x25	A=1; B=0; C=1
0x26	A=0; B=1; C=1
0x27	A=1; B=1; C=1

BROWNS BRAIN

THERE'S NOTHING SMARTER THAN A BRAIN!





Ordering Information

BB008-8bit	8 bit version
BB008-12bit	12 bit version