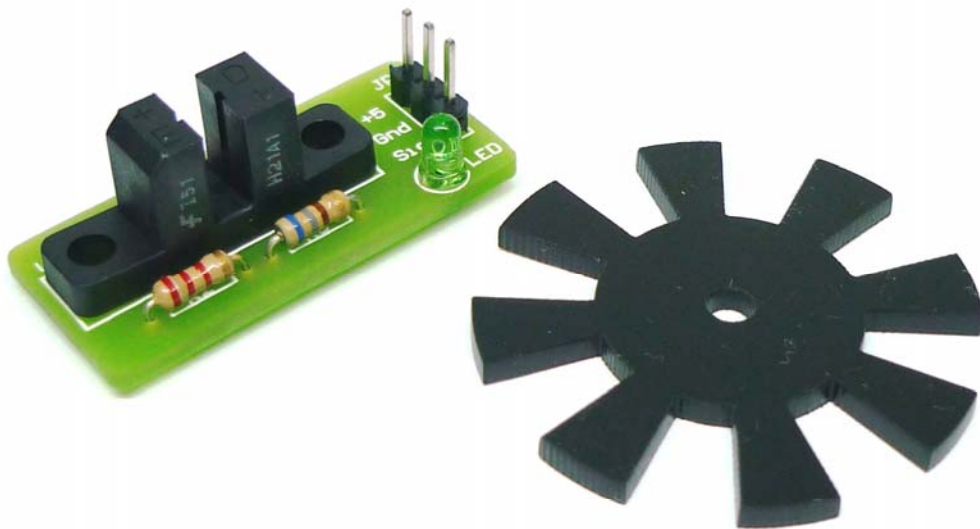




RE08A

Rotary Encoder Kit



User's Manual

V1.3

January 2010

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1. INTRODUCTION AND OVERVIEW

RE08A is a rotary encoder kit which comes with a slotted disc (8 slots) and a simple interface sensor board. No further soldering is required. Rotary encoder is a sensor or transducer used to convert the data of rotary motion into a series of electrical pulses which is readable by controller. The slotted disc has a 35mm outside diameter with 8 slots that provides 16 transitions. The optical sensor is used to sense the 16 transitions of the slotted disc. With these transitions, controller is able to recognize the rotary angle of the disc. With this concept, a rotary encoder can be employed in a DC motor shaft for the controller to 'know' its current position.

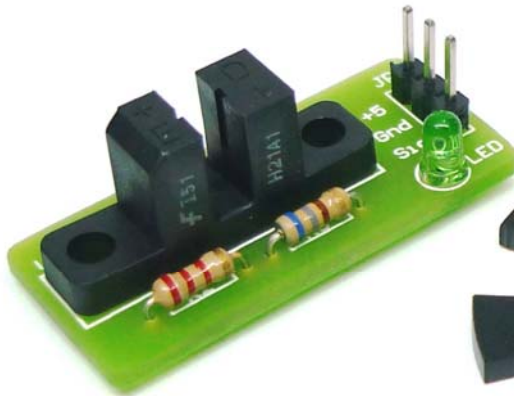
This rotary encoder kit has been design with the features of:

- Industrial grade PCB with high reliability yet professional outlook.
- Every component is soldered properly and every kit is tested before being shipped to customer.
- Simple **3 pin interface** (+5, Gnd and Sig).
- Included On board green LED as indicator.
- **Direct connection to microcontroller** (internal pull-up to 5V).
- Up to **1 KHz** (1000 pulse/sec).
- Disc size: 35mm (outer diameter) x 3mm(inner diameter)
- Sensor board size: 12mm (height) x 35mm (length) x 15mm (width)

This document explains the method to use RE08A.

2. PACKING LIST

Please check the parts and components according to the packing list. If there are any parts missing, please contact us at sales@cytron.com.my immediately.



Sensor board



8 slots disc

1. 1 x RE08A sensor board
2. 1 x 8 slots disc

3. PRODUCT SPECIFICATION

Electrical Characteristics

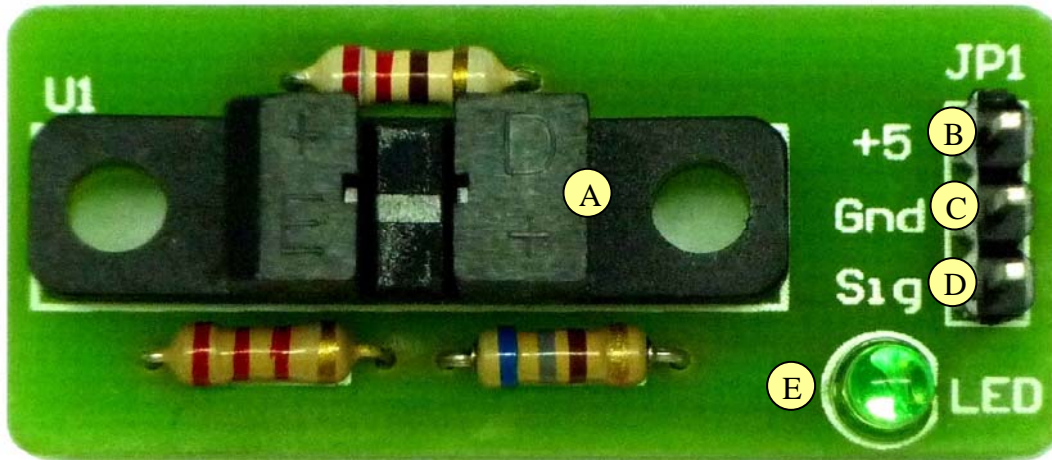
Symbol	Parameter	Min	Typ	Max	Unit
+5	Sensor board supply voltage	4.5	5	5.5	V
Gnd	System Ground	-		-	V
Sig	Signal output	0		5.3	V
V _{low}	Voltage during low stage (+5 = 5V)	0	0.8	1.0	V
V _{high}	Voltage during high stage (+5 = 5V)	4.5	4.7	4.9	V
f	Output frequency	0		1	KHz
I _{on}	Current at low state	25	30	40	mA
I _{off}	Current at high state	5	10	20	uA
T _{OPR}	Operating Temperature	0	25	75	°C

Truth Table in Normal Operating Condition (+5 = 5V)

Optical sensor	Signal	LED status	Comment
Unblocked	0V	ON	Low state at “Sig” output pin
Blocked	5V	OFF	High state at “Sig” output pin

* Blocked = The center space blocked by the slotted disc.

4. PRODUCT LAYOUT



Label	Function	Label	Function
A	Optical Sensor	D	Signal output/pulse output
B	+5 input supply	E	Indicator LED
C	Ground/Negative of supply		

Optical sensor at “A” will detect the missing slot of disc when the disc rotate, further generate pulses at signal pin.

Header pin at “B” is input supply. User should connect 5V (+) to this pin.

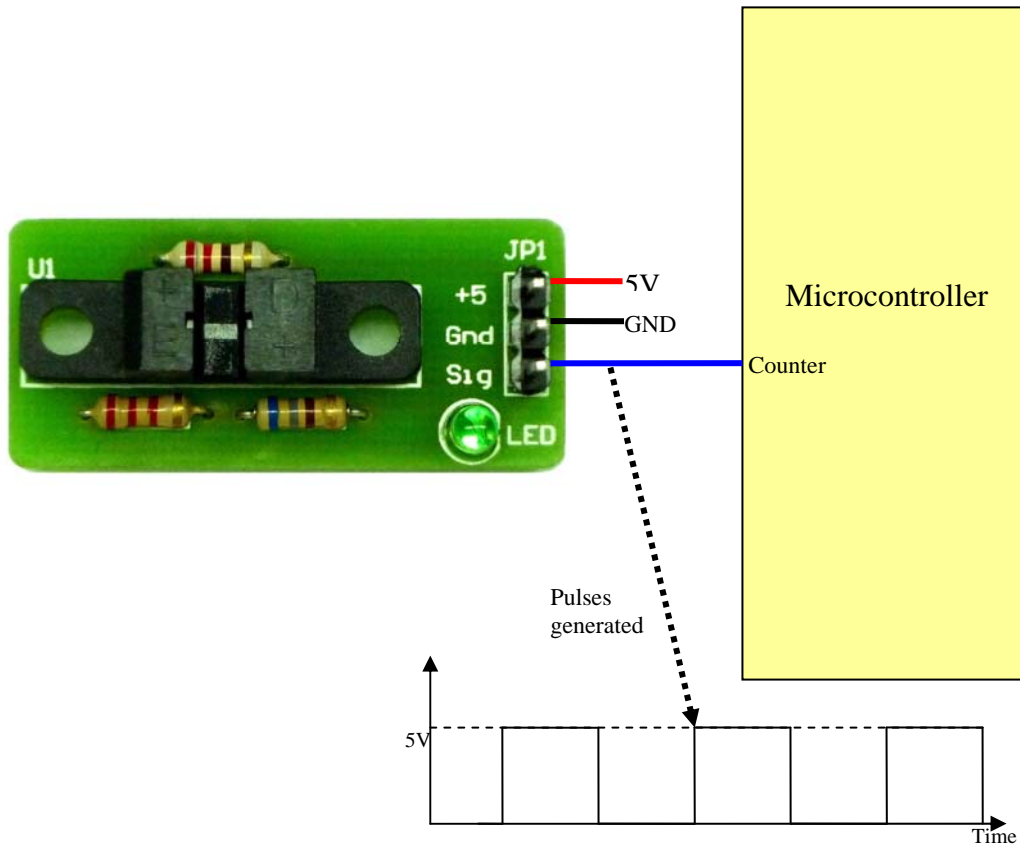
Header pin at “C” is ground of 5V supply, or in other words, the negative terminal of supply.

Header pin at “D” is signal output of sensor board. This pin is internally pull-up to 5V, thus no extra component is needed for this sensor to be connected to controller.

LED at “E” is an indicator. This LED will light ON if the disc does not block the optical sensor.

5. INSTALLATION (HARDWARE)

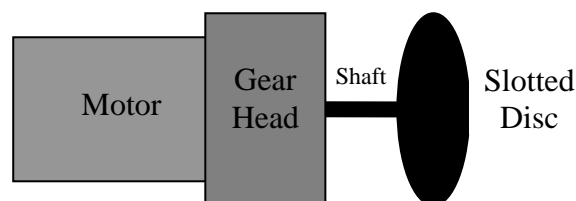
The hardware installation is divided into two parts. The first part is sensor board. Following figure shows example of wiring from sensor board to a microcontroller.



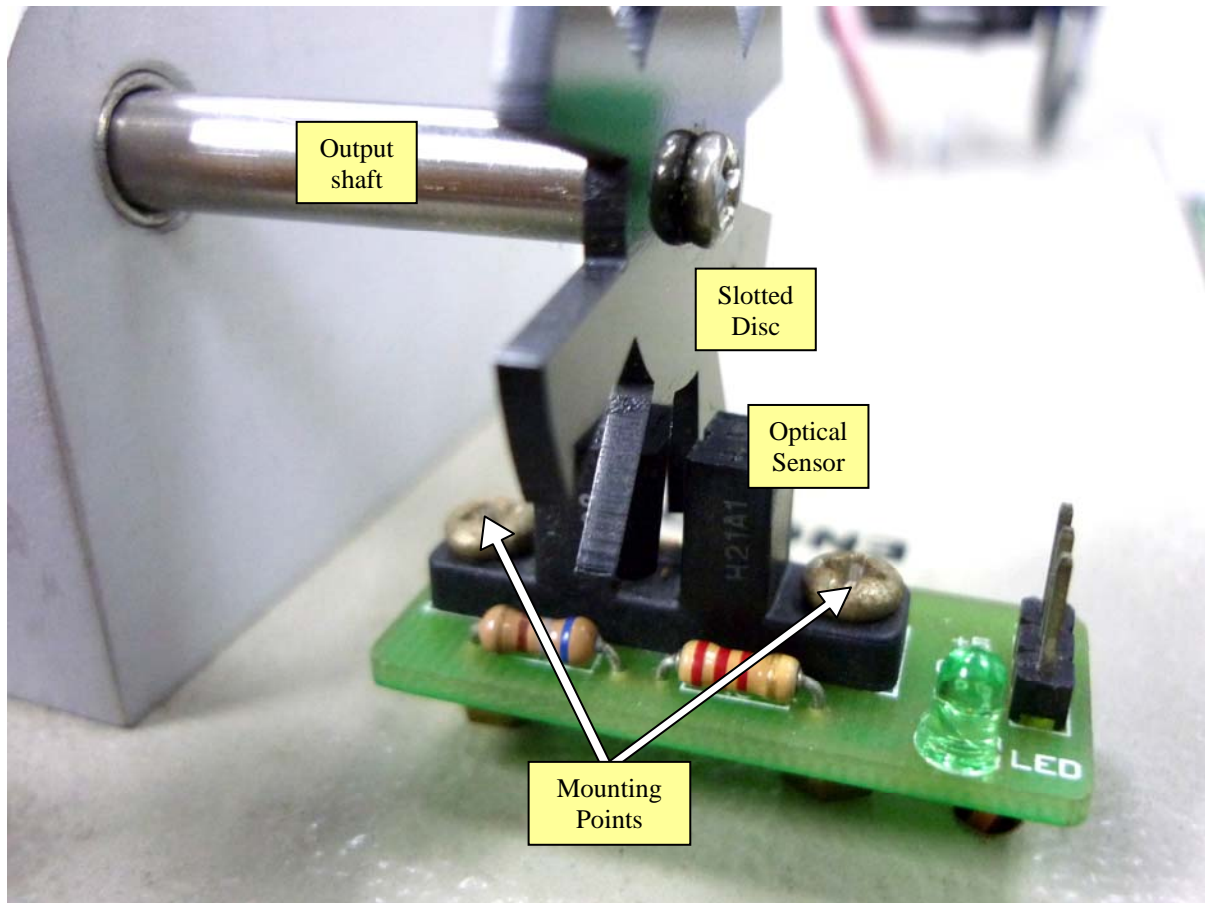
Simply connect the “+5” and “Gnd” to 5V supply, further connect the “Sig” pin to microcontroller input pin. Normally, the “Sig” will be connected to Counter/Clock/Encoder input for automatic counting purpose.

Note: Please DO NOT connect wrong polarity input to sensor board. This will ruin the sensor.

Second portion of hardware installation is the slotted disc. This disc should be mounted to motor shaft or gear output as shown in following figure.



To get the rotation output from rotating shaft, the slotted disc must be placed within the space between optical sensor as shown in the following picture.



Note: Please DO NOT break the slot of slotted disc during installation.

6. GETTING STARTED

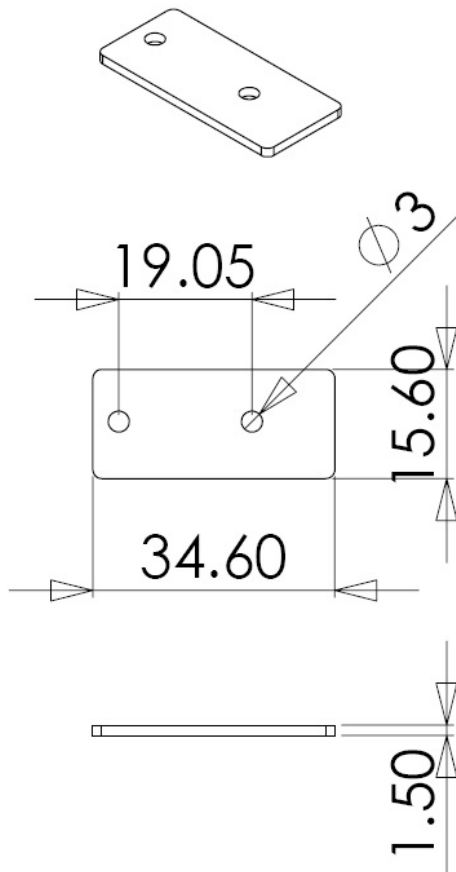
After installation, the rotary encoder is ready to count the rotation of output shaft. This information can further be calculation to obtain speed of output shaft or the velocity of motor.

This kit is very simple and compact. User can connect it to any microcontroller using the 3-pin header. The onboard infrared beam detects missing slots in a slotted encoder disk, and generates a pulse train. The generated pulses are a 0 to 5V output. It provide a +5V output when the optical beam is blocked, and a 0V output when the beam is unblocked. The microcontroller can simply read the 0-5-0V pulse train to determine the distance of robot if the shaft is mounted to wheel and the wheel diameter is known, of course it can further be used for velocity.

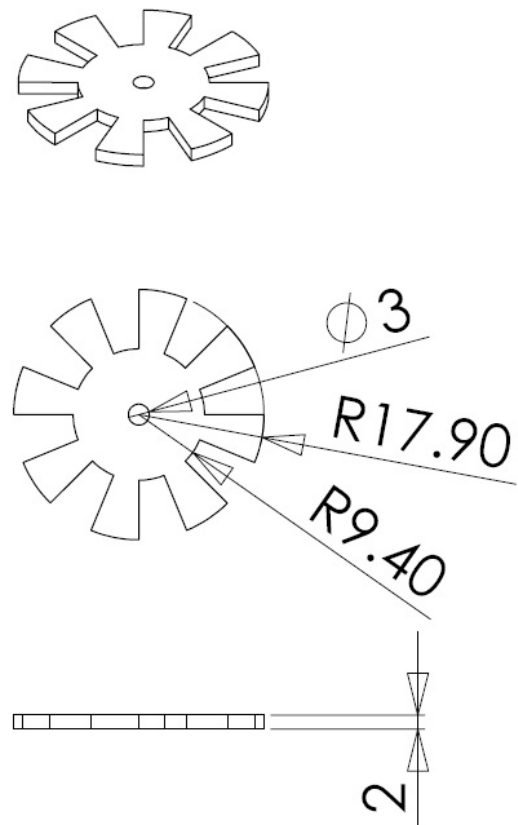
Simply follow the installation guide and configure microcontroller to count the pulses generated when the shaft rotates. Software configuration is not covered in this document as there are too many type of microcontroller and each of them have different configuration. Please refer to related data sheet of each microcontroller for the configuration details.

7. DRAWING AND DIMENSIONS

Bare PCB Board



Slotted Disc



8. WARRANTY

- Product warranty is valid for 6 months.
- Warranty only applies to manufacturing defect.
- Damage caused by mis-use is not covered under warranty.
- Warranty does not cover freight cost for both ways.

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