Over Speed Sensor - Over Speed Alarm using Magnetic Pickup Sensor

This is an over-speed sensor module, that provides an audible warning and signals output when the speed of a machine is above a set point. The module can be used in applications such as Engines, Machines, Sports machines, and Fitness Equipment. The speed of the machine or engine can be detected using magnetic pickup sensors. The project can be used in many applications where an over-speed monitor is important. The board is based on the LM2907 chip that works as a frequency to voltage converter, interfacing a magnetic pickup as shown in the figure below. A typical magnetic pickup for automotive applications will provide a thousand pulses per mile so that at 60 mph the incoming frequency will be 16.6Hz. When the reference level on the comparator is set by two equal resistors R2 and R6 then the desired value of C5 and R4 can be determined from the following simple relationship:

Buzzer is Energized when Frequency ≥ (1/(2XR4C5))

From the RC selection chart, we can choose suitable values for R5 and C5. With the current circuit, the frequency is set to 500Hz approx. The frequency trigger point can be changed as per user requirement using above equation. The module supports any sensor voltage level from 20mV to 28V.

Magnetic Pickup
A Magnetic Pickup Sensor consists of a permanent magnet, a pole-piece, and a sensing coil all encapsulated in a cylindrical case. Magnetic Pickup is most frequently used to sense passing teeth on a gear, sprocket, or timing belt wheel, to bolt-heads, key-ways, or other moving machine-mounted targets.
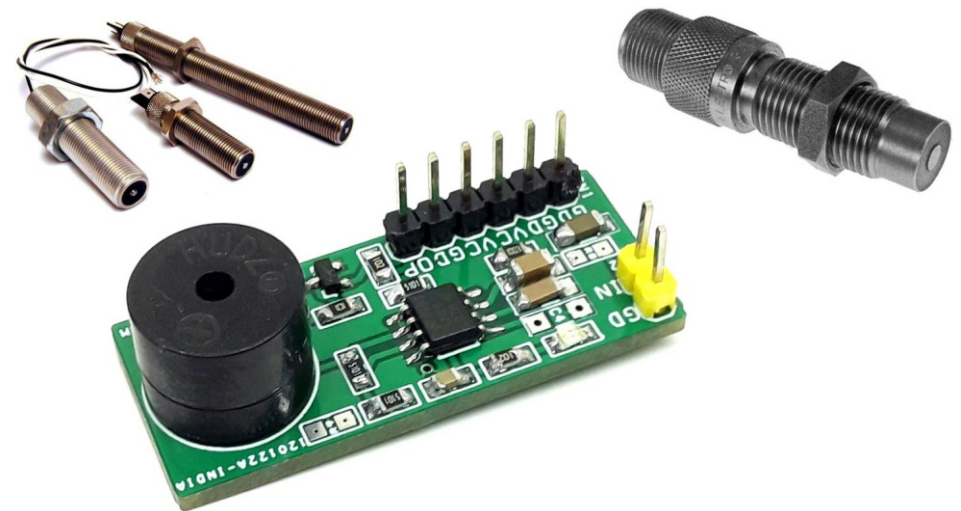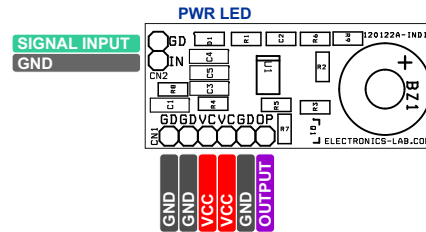
Connections: Cn1
- Pin 1 Output Normally Low, Goes High When Over Speed Sense,
- Pin 2, Pin5, Pin6 = GND
- Pin 3 and Pin 4 = VCC Supply Input

Connections CN2 : Magnetic Pick Up Sensor

Features
- Supply 12 to 15V DC @ 20mA
- Optimized for Magnetic Pickup Sensor
- Other Optical Sensor, Mechanical Sensor, Tachometer sensor can be used
- Inputs Voltage Level 20mV to 28V
- Buzzer Operates when Input frequency is above 500Hz
- Provide High Output When Speed is bellow Set Point
- Header Connector for Supply Input and Output
- 2 Pin Header for Sensor
- D1 Power LED
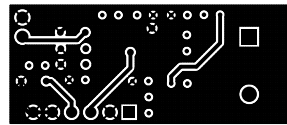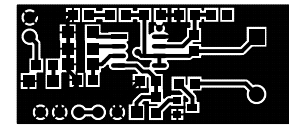- PCB Dimensions 38.42 x 16.19mm

07005

Applications

- Engines
- Tachometer Under/Over Speed
- Fitness Equipment
- Sports Machines
- Machine Automation
- AC/DC Motor Speed Monitor

PWR LED

SIGNAL INPUT
GND

GND GND VCC VCC GND OUTPUT

				BOM			
NO	**QNTY.**	**REF.**	**DESC.**	**MANUFACTURER**	**SUPPLIER**	**SUPPLIER PART NO**
1	1	BZ1	BUZZER	CUI DEVICE	DIGIKEY	102-CMI-1295-1285T-ND
2	1	CN1	6 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5319-ND
3	1	CN2	2 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5315-ND
4	1	C1	10uF/25V SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
5	1	C2	0.1uF/50V SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	1	C3	1uF/25V SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
7	3	C4,R8,R9	DNP			
8	1	C5	0.01uF/50V SMD SIZE 1206	YAGEO/MURATA	DIGIKEY	
9	1	D1	LED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
10	1	Q1	BC847AL	MICRO COMMERCIAL	DIGIKEY	BC847B-TPCT-ND
11	2	R1,R7	1K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	3	R2,R5,R6	5K1 1% SMD SIZE 0895	YAGEO/MURATA	DIGIKEY	
13	1	R3	100E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	1	R4	100K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
15	1	U1	LM2907-N	TI	DIGIKEY	LM2907M-8/NOPB-ND
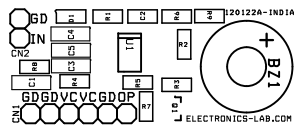
SILK SCREEN TOP

BOTTOM LAYER

TOP LAYER

PCB DIMENSIONS 38.42MM X 16.19MM