

Under Speed Warning Alarm for Magnetic Pickup sensor - Frequency Controlled Switch

This is an under-speed sensor module that provides an audible warning and signals output when the speed of a machine is below the set point. The module can be used in applications such as Engines, Machines, Sports machines, Fitness Equipment, Speed of the machine or engine can be detected using a magnetic pickup sensor. The project can be used in many applications where an under-speed monitor is important. The project is based on the LM2907 chip which works as a frequency to voltage converter, interfacing of 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 ~ 16.6 Hz. If 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 simple relationship:

$$\text{The buzzer is activated when Frequency} \geq (1/(2XR4C5))$$

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

Magnetic Pickup

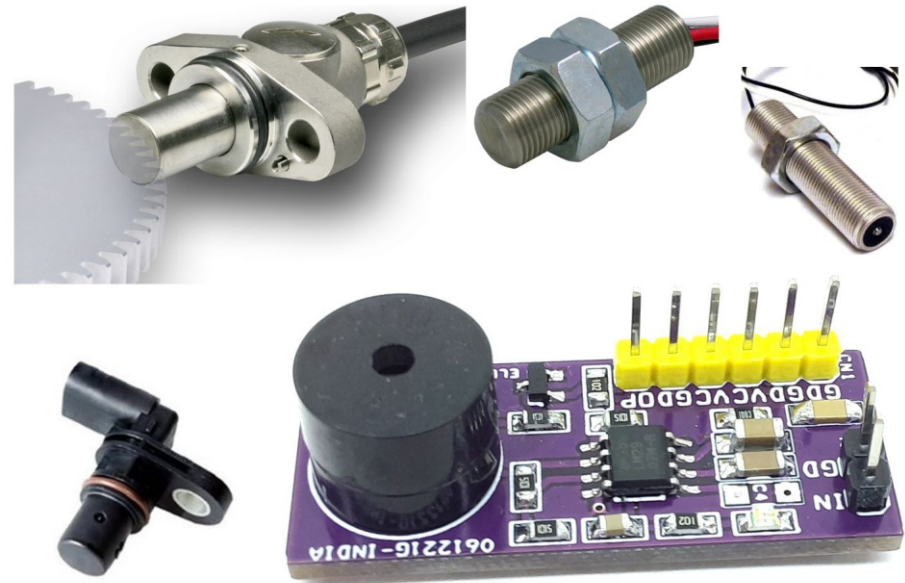
A magnetic pickup consists of a permanent magnet, a pole-piece, and a sensing coil all encapsulated in a cylindrical case. A magnetic pickup is most frequently used to sense passing teeth on a gear, sprocket, or timing belt wheel, to bolt-heads, key-ways, or other moving machine-mounted targets.

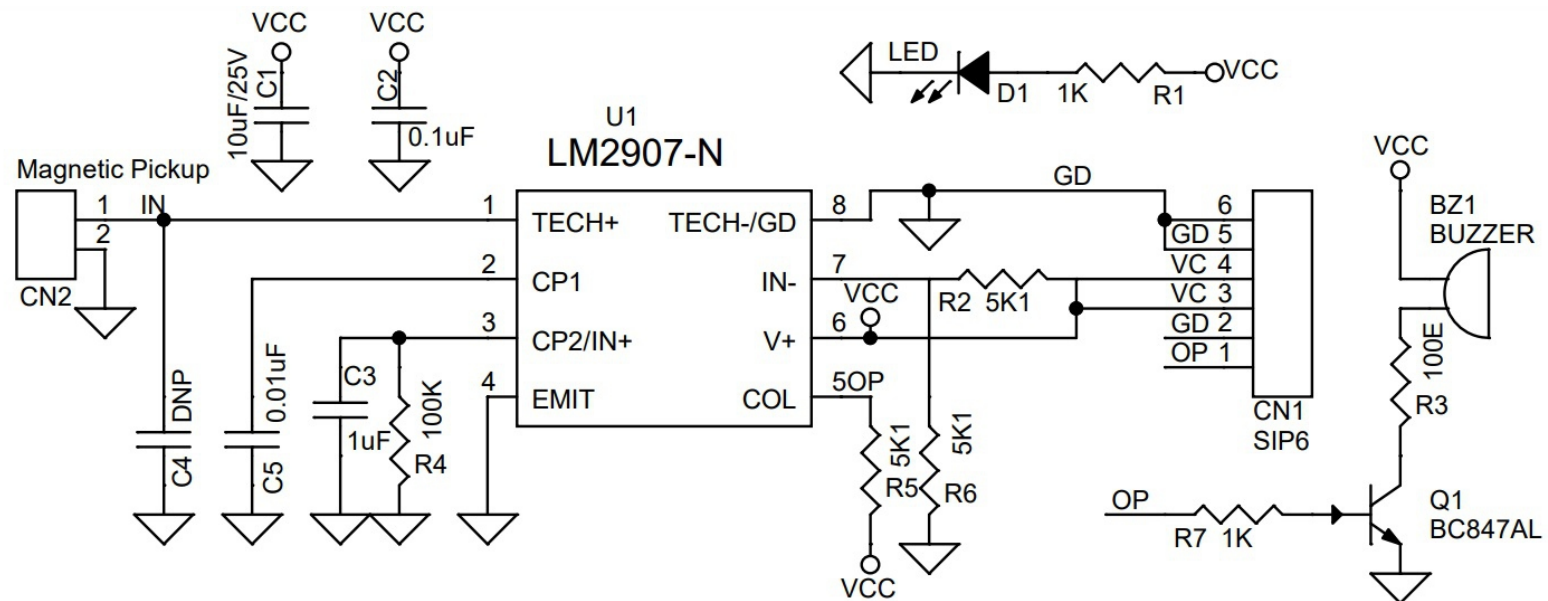
Features

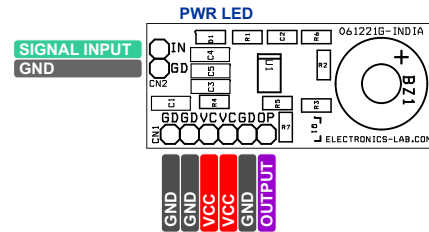
- Supply 12 to 15V DC @ 20mA
- Optimized for Magnetic Pickup Sensor
- Other Optical Sensor, Mechanical Sensor, Tachometer sensor can be used
- Inputs Voltage Level 20mV to 28V
- Buzzer Operates when Input frequency is below 500Hz
- Provide Low Output When Speed is below Set Point
- Header Connector for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

Applications

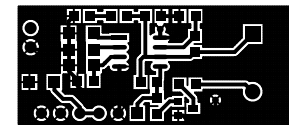
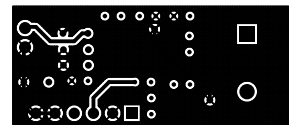
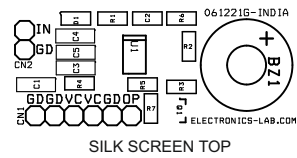
- Engines
- Tachometer Under/Over Speed
- Fitness Equipment
- Sports Machines
- Machine Automation
- AC/DC Motor Speed Monitor







BOM						
NO	QNTY	REF.	DESC	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	1	BZ1	BUZZER 5V SMD SIZE 12MM	CUI DEVICES	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	C3	1uF/25V SMD SIZE 1206	MURATA/YAGEO	DIGIKEY	
5	1	C2	0.1uF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
6	1	C4	DNP			
7	1	C5	0.01uF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
8	1	D1	LED SMD SIZE 0805	LITE ON INC	DIGIKEY	160-1427-1-ND
9	1	Q1	BC847AL	MICRO COMMERCIAL	DIGIKEY	BC847B-TPCT-ND
10	2	R1,R7	1K 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
11	3	R2,R5,R6	5K1 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
12	1	R3	100E 5% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
13	1	R4	100K 1% SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
14	1	U1	LM2907-N	TI	DIGIKEY	LM2907M-8/NOPB-ND
15	1	C1	10uF/25V SMD SIZE 1206	MURATA/YAGEO	DIGIKEY	



PCB DIMENSIONS 38.42MM X 16.19MM