

Automatic BIKE TURNING INDICATOR

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The automatic bike turning signal system based on a microcontroller (MCU) available in the market is expensive and difficult to program. Here is a simple and inexpensive circuit that you can build yourself. The circuit is used to indicate left or right turns for a bike or two-wheeler. Two identical circuits are needed, one for left and one for right. The author's prototype is shown in Fig. 1, and the accelerometer sensor used in the project in Fig. 2.

Circuit and working

Circuit diagram of the bike turning indicator is shown in Fig. 3. The

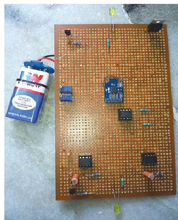


Fig. 1: Author's prototype

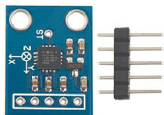


Fig. 2: ADXL335 accelerometer sensor

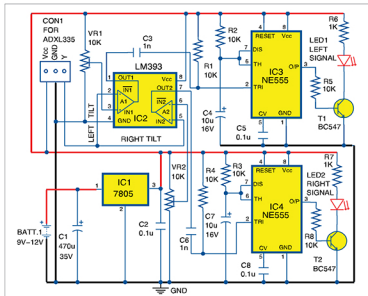


Fig. 3: Circuit diagram of bike turning signal system

circuit consists of ADXL335 accelerometer sensor, voltage regulator 7805 (IC1), LM393 comparator IC (IC2), two NE555 timer ICs (IC3 and IC4) and a few other components.

ADXL335 is a small, thin, low-power, complete 3-axis (X, Y and Z directions) accelerometer with signal-conditioned voltage outputs. Only Y direction of ADXL335 is used in this project. The device measures acceleration with a minimum full-scale range of ± 3 volts. It can measure static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration resulting from motion, shock or vibration.

Dual comparator LM393 is an 8-pin IC with pins 1, 2 and 3 forming one comparator and pins 5, 6 and 7, another comparator. The two comparators are used to monitor left and

right indicator signals. Two NE555 timer ICs (IC3 and IC4) configured in a monostable multivibrator are used; one for left signal and the other for right signal. Here, 9V-12V battery is converted to +5V DC using voltage regulator IC (IC1).

Left signal. When the bike handle is turned to the left, it gives a tilt angle output in the form of 1.2V to 2.6V voltage. Inverting terminal (pin 2) of IC2 is connected to ADXL335 sensor's Y signal, and non-inverting terminal (pin 3) is connected to preset (VR1). Pin 1 of IC2 outputs the left tilt angle signal.

Set reference voltage 2.2V at pin 3 using preset (VR1). Initially, when the bike handle turns 90 degrees towards right, comparator voltage levels at pin 3 will be 2.2V, and at pin 2 will be around 2V. Hence, comparator output