

# **A FULLY AUTOMATED EXPERIMENT TO MEASURE KINETIC ENERGY AND POTENTIAL ENERGY OF A FALLING MASS**

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## **ABSTRACT**

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As its name implies, a fully automated experiment to measure kinetic energy and potential energy of a falling mass- This is a fully automatic experiment to compare kinetic energy and potential energy. In the experiment a ball bearing is used as the falling mass. The mass of the ball bearing and length of the string used to hold the ball bearing is fixed. The height of the ball bearing is varied with the help of motor, as the height increase distance travelled by ball bearing increase, as an effect velocity also increases. When the program is run the height of the ball bearing is measured by Ultrasonic sensor, then the lower electromagnet is de-magnetized and the ball bearing detached from electromagnet and allowed to swing. When it reaches the center point the ball bearing touches a switch and the upper electromagnet is de-magnetized. The string holding the ball bearing is detached from the point where it was attached. The ball bearing is allowed to fall down, the distance traveled by the ball bearing is measured using an Ultrasonic sensor and the time taken by the ball bearing to reach that point is noted. All the data is collected by the computer using Visual Basic programming language thereby kinetic energy and potential energy is calculated and compared.

This project is divided into hardware design and software development. Hardware design consists of the construction and implementation of circuits for Two Ultrasonic Range Meter, The main frame, two electromagnets and motor. The software design includes the Visual Basic program for user interface and control ports, the microcontroller program for interface between the Ultrasonic range meter and computer.