ABSTRACT

Since the Indonesian Computer University (UNIKOM) was established in 2000, the calculation of the acceleration of gravity at the Physics Laboratory using a manual method or not computerized. These claims UNIKOM campus today as the computer has the intention and desire to computerize all the equipment in the Physics Laboratory. One simple harmonic motion, the acceleration of gravity made gauges with automatic pendulum method is more efficient without using a stopwatch as in the lab so far.

The method used is the pendulum method is a method to calculate the acceleration of gravity using a pendulum like a solid ball of iron that is connected with a rope tied around the pole statip. The pendulum is swinging with a certain angle θ so as occurred Simple Harmonic Motion. The length is measured from the tip statip rope to pendulum center of mass is in the middle of the diameter of the pendulum. Substitute devices manually is to use a stopwatch timer basic stamp microcontroller, then the input data (length of rope and a lot of swing) through the keypad and the movement up and down the length of the string pendulum carried by a stepper motor and the acceleration of gravity calculation results shown in the Liquid Crystal Display (LCD). Mechanical way is compared with manual calculations by the method of least squares (LS), which is a method for finding the equation of a straight line so that the experimental data obtained in the form of gravitational acceleration gradient value.

From the results of research and analysis carried out then the gravity values obtained by experiment manually, 9.619 m/s2, compared with a value of 9.8 m/s2 gravity determination has an error 1846% and the value of gravity (g) with experiments using mechanical equipment that is 9.619 m / s2 when compared with the provisions of gravity 9.8 m/s2 have 1846% error. For the measurement of the length of rope, time and number of swings have been automatically setup on the microcontroller.

Keywords: pendulum method, Stepper Motor, Acceleration of Gravity, Least Square Method, Basic Stamp microcontrollers, Simple Harmonic Motion