ABSTRAK

Sistem peringatan kemiringan menara dan *overload* jembatan gantung berbasis sensor kemiringan dan sensor massa telah dibuat. Sistem peringatan memanfaatkan sensor *Load Cell* sebagai alat pengukur massa di atas jembatan gantung dan sensor kemiringan MPU6050 sebagai alat pengukur kemiringan menara jembatan gantung. Mikrokontrol arduino digunakan sebagai pusat kendali sistem elektronika, sekaligus sebagai pengatur fungsi logika peringatan untuk mengaktifkan *LED, buzzer* dan *LCD*. Hasil penelitian sistem diperoleh ADC dari sensor kemiringan MPU6050 dan tegangan keluaran dari sensor *Load Cell* guna mengetahui fungsi kalibrasi sensor. Hasil uji karakteristik statik sensor kemiringan dan sensor massa memiliki rata-rata nilai akurasi sebesar 96,39% dan 99,55%, presisi sebesar 96,33% dan 99,55%, error sebesar 3,61%dan 0,45% serta waktu respon sebesar 1 detik dan 2 detik.

Kata Kunci: kemiringan menara, jembatan gantung, *overload*, sensor MPU6050, sensor *Load Cell*.

ABSTRACK

This research is entitled "Tower Tilt Warning System and Overloaded Suspesnsion Bridge Based on Slope Measurement and Mass Sensors". A warning system based on tower tilt and an overloaded suspension bridge rested on mass and slope measurement were invented. This early warning system uses load cell sensor as a mass measuring device over the suspension bridge. The use of MPU6050 slope sensors were also applied as tilt measuring device of the suspension bridge towers. On the other hand, audrino microcontroller was utilized as both, an electronic system control center as well as a logic controller warning to activate LED and buzzer. The LCD then worked as the display to monitor the situation, whether it is safe or dangerous. According to the system observed, there were multiple results obtained, such as the ADC came from MPU6050 tilt sensors. The output voltage from the load cell sensor was meant to figure out how the sensor calibrations function. The testing result on the static characteristic of the tilt and mass sensors have the average accuracy of 96.39% and 99.55%. Meanwhile, the precision rate of tilt and mass sensors is 96.33% and 99.55%. Contrary, the error percentage of those sensors shows 3.61% and 0.45%. The response time of the two sensors above is demonstrated at one seconds and two second.

Keywords: *Slope of towers, suspension bridge, overload, MPU6050 sensors, load cell sensor.*