Abstract
In the development of road and bridge infrastructure, especially roads that connect isolated areas or difficult access to the center of the economy so that the distribution of agricultural products can be easily distributed without having to be very expensive, population and economic growth will increase rapidly along with the increase in facilities and road infrastructure. Huang Hilbert Transform-based Damage Detection or better known as HHT can be applied to bridge health predictions where HHT itself has a prediction algorithm that uses time-frequency energy or what is known as lambda waves so that the algorithm can be used to determine the bridge frequency. To facilitate the operation of the HHT algorithm, support is also needed in the form of sensor nodes that function as data collection such as the SunSPOT sensor. The test results from this study can be concluded that the results of the SunSpot Solarium have very good performance for capturing data on the accelerometer sensor system and sink node, The resulting data are 512 accelerometer data samples and 512 seconds of sampling time. Obtaining the average frequency value of each HHT and FFT in each experiment, then for the best model of normal structured bridge conditions, the best model is obtained with the HHT frequency value 17.38 Hz and the FFT frequency value
15.93 Hz, while for the best model of The condition of the damaged structured bridge is obtained with the best model with the HHT frequency value of 16.38 Hz and the FFT frequency value of 15.60 Hz. While the results of the average frequency value for each experiment on a normal structured bridge condition for HHT is 16.7480 Hz and for the average time of each sensor is 0.8675 m / s and for a damaged structured bridge is 15.9179 Hz and for the time of each 0.825 m / s average. The time generated from HHT is the time of each sensor where the frequency appears at what time, it can be seen that the bridge with the lower the stiffness, the greater the resulting frequency.

Keywords: HHT, IMF, FFT, Damage Detection, SunSpot