

## ABSTRACT

Nanosatellite is a small sized satellite with a weight of approximately 1-10 kg. Nanosatellite has a 1U size or 10cm x 10cm x 10cm with a standard reference design nano satellites made by CubeSat. Nanosatellite orbiting on LEO orbit with a height of 600-1000 Km. At the nanosatellites are actuators for moving nanosatellites in LEO orbit. There are two types of actuator, that is active actuator and passive actuator. To support the nanosatellite in this study used active actuator of magnetorquer. Magnetorquer used to determine the position and set the nanosatellite attitude in order to maintain the orientation of the nanosatellite in orbit in case of tumbling in space. In a previous study<sup>[12]</sup>, magnetorquer made of wire windings wrapped around on the side of the nano satellite. The setting position is the reference in namely nanosatellites in the direction of the roll, pitch, and yaw. Magnetorquer be the primary control for nano satellites in utilizing the interaction between the Earth's magnetic field with the magnetic field generated by magnetorquer in nanosatellites, so the nanosatellite more secure and stable orbit.

Magnetorquer in this study is made of the microstrip line who gave to electrified sourced from the H-bridge circuit. The function of the H-bridge circuit is to reverse the direction of positive and negative polarity, so that when the nanosatellites in a state of shaking or tumbling caused by collisions with objects in space, so the nanosatellite orbiting can return orbit. Magnetorquer already electrified by the H-bridge circuit, then the microstrip line generated magnetic field in the area around the microstrip line with the circular spiral shape. The magnetic field generated by a microstrip line can be measured by using a magnetometer. Magnetometer can detect magnetic fields produced by the microstrip line, so that the magnetic field generated from the microstrip line can be measured by magnetometer. The magnetic field measured by the magnetometer output can be analyzed in the form of magnetic field induction.

Magnetorquer designed to have a maximum power consumption of 5 W with a maximum input current is 1 A. Magnetorquer placed on the bottom side of nanosatellites. Nanosatellites are already installed magnetorquer subsequently measured magnetic induction is generated by using a magnetometer sensor and Gaussmeter. With the magnetometer sensor of HMC8331 obtained intensity of the magnetic induction of at least 0.811  $\mu\text{T}$  and 1.596  $\mu\text{T}$  maximum. While using the results obtained Gaussmeter measuring the intensity of the magnetic field induction of at least 10  $\mu\text{T}$  and a maximum of 40  $\mu\text{T}$ .

*.Keywords : Nanosatellite, magnetorquer, H-bridge circuit, magnetic induction*