ABSTRACT

Cubesat 1U is a satellite with a size of 100 mm × 100 mm × 100 mm and has a mass of 1.33 Kg which orbits in low Earth Orbit orbit. Have 4 subsystems, namely the electric power system (EPS), on board data handling (OBDH), attitude determination control system (ADCS), and radio frequency (RF). This final project combines two subsystems, EPS and OBDH, called power control and data handling (PCDH). PCDH developed by the National Aeronautics and Aviation Institute and the Berlin Institute University was chosen as the main reference because it supports functions that can be implemented at 1U cubesat.

The design done in this final project is designing software consisting of scroll GUI, serial port connection, and PCB layer power control unit. The implementation is done by printing the PCB layer power control unit which is integrated with the DUE Core R3 microcontroller. Power control on this PCDH is to change the output voltage to 3.3V, 5V, and 12V with switches and fuses. Data handling is carried out by communication between the charge and reaction wheel speed.

The result of PCDH design and implementation of PCDH are can control the speed of reaction wheels and has an output voltage of 3.3V, 5V, and 12V. Switch testing is done by monitoring the response of pin I/O on the oscilloscope. Test by entering the data string in the GUI which is translated by PCDH into an integer and then into a pulse width modulation signal (PWM) and a 12 bit digital analog converter that can adjust the speed and change the direction of the reaction wheels. To control the speed is done through pulse width modulation with a duty cycle range of 0-8% with a standstill at a duty cycle of 4%..

Keywords: Cubesat 1U, Handling of Power Control Data, Electric Power Systems, Handling Data On Board