

ABSTRACT

Quadcopter is a drone that has four propellers mounted on the motors to fly and control quad copter itself. Along with the times, quad copter have utility in a variety of ways, for example quad copter can take a pictures monitoring the area, and many more that done in the air. But controlling the quadcopter requires specific expertise. Stability control hovering quad copter is one of the problems in controlling quad copter. To overcome these problems in this final project designed a system that is able to maintain the stability of the hovering quad copter.

Prototype is designed using PID controller method to facilitate the determination of the motor speed on quad copter. Each motor rotation speed will be compared to the others motor, so there is the same rotation on each motor.

The designed system has gained mathematical modeling in quadcopter using Newton Euler method. The results of the modeling is used to determine the PID parameters by performing simulations using the software MATLAB, Simulink. Based on the simulation results that have been made in controlling the movement of the pitch angle (θ) gain value $K_p = 1.2$, $K_i = 0.9$, and $K_d = 0.7$ and get the value of rise time = 1 second, overshoot = 21.047% and settling time = 8 second . Roll angle (ϕ) gain value $K_p = 1.2$, $K_i = 0.9$, and $K_d = 0.7$ and get the value of rise time = 1 second, overshoot = 21.044% dan settling time = 10 second. Control of yaw angle (ψ), gain value $K_p = 1$, $K_i = 0.01$, and $K_d = 1.8$ and get the value of rise time = 1 second, overshoot = 0.54% dan settling time = 6 second.

Keyword : Quadcopter, PID controller, hover