

ABSTRACT

In this final project, a self-balancing trolley will be designed that is able to level the trolley table position when passing through the incline, downhill and tiled roads. The system made is also equipped with power monitoring which aims to make it easier for users to see battery capacity. Using the IMU angle sensor which has an average error value of 0.1071 and the ACS712 current sensor which has an average accuracy rate of 98% in its readings. Using a parvalux 12V motor as an actuator and a 12V 9Ah dry battery as a battery.

Trolley testing is done by pushing the trolley through an uphill, downhill road at an angle of 10°, 20°, 30° by carrying the load on the trolley table weighing 1-6 kg. The trolley was also tested on a paved road carrying a load of 2 kg. The goal is to see if the trolley table can return to a flat state. Also conducted a discharge test and battery charging to see the decrease and increase in the SOC value. The result of this final project is that the trolley table is able to return to a flat state when passing uphill, downhill and tiled roads carrying loads. The fastest response was recorded with a time of 2.12 seconds with a 10° angle carrying a 1kg load over the incline. For power monitoring, it has succeeded in displaying the reduced and increased SOC value on the LCD when the trolley is used and the charging process.

Keywords : IMU, ACS712, *Self-balancing*, SOC.