

ABSTRACT

Automation of transportation can be a solution to a public transport bus, from social phenomenon that bus management suspects incorrect counting from operation of the bus. There's a Suspicion toward payment income form that is not in accordance with the number of passengers of the bus service. From this case, bus management and users of bus transportation services need an automation system to check the correct number of passengers in real time.

The system of automation that can be the solutions to these problems is Occupant Detection System (ODS) based on capacitive sensing method which functions to detect humans sitting in a bus seat. Occupant Detection System (ODS) can be designed using a capacitive sensing method by measuring the change in the value of the dielectric between the electrode plate placed on the bus seat. Changes in the value will be compared from the dielectric or permittivity of the insulating material (ϵ_r) to the load that fills the bus seat to ensure the presence or absence of passengers.

The test results show that the test variables are types of goods, types of fabric/ materials used by humans (passengers) and passenger mass compared to empirical measurements and sensor output data. The value limit of the ODS touch read sensor that is read on serial monitors for human detection has a threshold value of 40. The human dielectric constant theoretically has a value of ± 74.1 so that for the passenger mass test variable it does not have a sufficiently far range of values. The value of high ODS accuracy is $> 95\%$ with a small error percentage $< 5\%$. Sensor ODSs can be an alternative solution to be able to detect the presence or absence of passengers on the bus seat. This system can guarantee the accuracy of information and the accuracy of data provision for bus management so that it can minimize bus operational fraud and can increase automation in the field of public transportation.

Keywords: *Occupant Detection System (ODS), Capacitive Sensing Method, Dielectric Constant*