ABSTRACT

Weight monitoring systems using Load Cell sensors have been widely applied in laboratory research, especially for the classification of test animals such as mice. This study aims to evaluate the performance of local weight readings using an ESP8266 microcontroller integrated with an HX711 module and a Load Cell sensor. Unlike IoT systems that focus on transmitting data over long distances, this system focuses on analyzing performance locally, including three main parameters: reading delay, accuracy against reference values, and data stability under fixed and dynamic load conditions. Tests were conducted for 1 minute for each of the 10 mice with a data transmission interval of every 10 seconds, resulting in six data transmissions per mice. The test results show that the system is able to display real-time weight data with an average delay of 44.7 ms and the deviation of readings from the reference is within ±0.3 grams. The level of conformity between the reading data and the data sent reached 91.7%, indicating that the system has good accuracy and stability. This research proves that ESP8266 is a reliable tool for analyzing the performance of local weight monitoring systems and serves as a basis for the development of IoT-based animal classification systems.

Keywords: Load Cell, HX711, ESP8266, Delay, Accuracy, Local Monitoring, Mouse, Data Transmission.