ABSTRACT

The use of humans in testing combat vehicles is considered less accurate, as human testers vary in their emotions and physical abilities. To achieve a more accurate testing of combat vehicle suitability, a smart mannequin is developed for this purpose, aiming to avoid permanent fatal injuries to human testers. The research on smart mannequins focuses on integrating a heart module and sensor data transmission. The use of LoRa Aurora microcontroller and KY-037 sound sensor enables monitoring of heart conditions and wireless data transmission through LoRa communication. The methodology involved literature review on smart mannequin technology, design and development of the heart module and KY-037 sound sensor, prototyping, and implementing the LoRa Aurora microcontroller to test the range of data communication capabilities of the sensor within the smart mannequin. The prototype is tested on 4 extreme tracks at the PT. Pindad road testing field to assess the sound levels using the KY-037 sound sensor. The results indicate that data transmission reliability using LoRa is effective and can work within a range of up to 800 meters inside the ANOA 6x6 vehicle. The KY-037 sound sensor is also proven effective, even in high sound interference conditions, with a maximum decibel reading of 141 dB during a 2-second test on parallel beam tracks. The successful testing of the smart mannequin's heart module prototype is expected to contribute to the development of more accurate and efficient technology for testing combat vehicles.

Keywords: Lora Aurora, KY-037, Smart Mannequin, Wireless, Sensors