ABSTRACT

The development of technology in the field of electronics has a significant impact in improving security, one of which is through the use of metal detectors. This research aims to analyze the applicability and accuracy of the Antares-based metal detector system in detecting metal at various distances and examining the resulting amplitude signal. The method used is black box testing, which focuses on testing the functionality of hardware and software without regard to the internal implementation of the software, as well as verifying the conformity of each tested tool with predefined specifications. This research shows that the Antares-based metal detector system has high accuracy. Without an object, the peak voltage measured was 3.44 volts and the minimum voltage was -0.32 volts. At a distance of 5 cm, the maximum voltage was 2.68 volts and the minimum was 0.24 volts, while at a distance of 1 cm, the maximum voltage was 1.12 volts and the minimum was -0.08 volts. The ADC values also varied: without object 1024 bits, at a distance of 5 cm 847 bits, and at a distance of 1 cm 76 bits. The signal amplitude showed 2.86 volts without the object, 1.75 volts at a distance of 5 cm, and 0.664 volts at a distance of 1 cm. This study confirms the importance of thorough testing for system performance validation, ensuring metal detection is performed with high accuracy according to specifications. In conclusion, the amplitude signal is high without an object, and decreases as the object gets closer to the sensor.

Keywords : Metal Detector, Sensor Kit DIY Metal Detector, Amplitudo Signal