

ABSTRACT

The development of industrial automation is now becoming more sophisticated in order to replace the work of human hands that have limitations because the process requires speed, high accuracy and precision, and reliability. One of them is by using a robotic arm instead of a human hand in the process of sorting goods.

Sorting classified by color, using a color sensor LDR. LDR has spectral response characteristics which LDR has no sensitivity for each of the wavelengths of light that fell on him (ie color). By using the principle of a voltage divider circuit it will get output that varies according to the LDR resistance changes caused by changes in the intensity of the light received LDR. The output of the circuit color sensor is going through the process of ADC on a microcontroller that can be further processed to detect the color determination. After the output of the sensor is processed microcontroller, the microcontroller will send instructions to the robot arm to execute the items according to their color - respectively.

From the results of the tests performed, the color sensor can detect the specified colors are red, green, and blue with distance sensor with an object that is 4cm. With the provision of data ADC as follows: red color obtained has a data range $35 \leq \text{red} \leq 55$, $100 \leq \text{green} \leq 120$, $110 \leq \text{blue} \leq 130$, the green color has a range of data obtained $115 \leq \text{red} \leq 135$, $90 \leq \text{green} \leq 110$, $135 \leq \text{blue} \leq 155$, and the blue color has a data range $120 \leq \text{red} \leq 140$, $145 \leq \text{green} \leq 165$, $125 \leq \text{blue} \leq 145$. Robot arm can be formed from the movement began to take an object, put the object to return to the starting position. With time average required to take the object to return to the starting position is 13,54 seconds for the red color, 12,64 seconds for the green color, and 13,26 seconds for the blue color.

Keyword : *Color, Color Sensor using LDR, Microcontroller, Robotic Arm, AX-12 Motor, Conveyor.*