

RANCANG BANGUN ALAT PENGATUR SUHU PADA LEMARI PENDINGIN

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ABSTRAK

Lemari pendingin mempunyai fungsi yang sangat penting dalam kehidupan saat ini. Pendingin berfungsi untuk menghambat laju respirasi pada bahan pangan seperti daging buah dan sayuran dapat bertahan dalam waktu yang relatif lama. Suhu yang terlalu tinggi atau terlalu rendah akan berpengaruh tidak baik pada beberapa bahan pangan. mesin pendingin penyimpanan bahan pangan ini menggunakan 4 kabin terpisah dengan suhu yang berbeda sesuai dengan kebutuhan suhu yang diinginkan, sistem ini kontroler PID di implementasikan ke sensor suhu DS18B20 untuk menstabilkan suhu dengan *setpoint* yang berbeda, nilai sensor DS18B20 diproses PID untuk mengatur relay dan solenoid dengan nilai $K_p=1$, $K_i=0.01$, $K_d=0.05$. Kamera sebagai pendeteksi warna sebelum masuk kabin sesuai kebutuhan suhu setiap bahan pangan. Pengujian *image processing* dari 20 data menghasilkan 15% error dan tingkat keberhasilan pembacaan warna 85%. Dari nilai PID yang dihasilkan sensor DS18B20 di semua kabin didapatkan selisih rata-rata 0,185 dari perhitungan dan *serial monitor* arduino.

Kata Kunci : lemari pendingin, DS18B20, PID.

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ABSTRACT

Refrigerators have a very important function in life today. Cooling serves to inhibit the rate of respiration in foodstuffs such as fruit and vegetable meat can last for a relatively long time. Temperatures that are too high or too low will have an adverse effect on some foods. This food storage refrigeration machine uses 4 separate cabins with different temperatures according to the desired temperature requirements, this system PID controller is implemented to DS18B20 temperature sensor to stabilize the temperature with a different setpoint, DS18B20 sensor value is processed by PID to regulate relays and solenoids with the value of $K_p = 1$, $K_i = 0.01$, $K_d = 0.05$. The camera as a color detector before entering the cabin according to the temperature requirements of each food. Image processing testing from 20 data resulted in 15% error and 85% color reading success rate. From the PID value produced by the DS18B20 sensor in all cabins, the average difference is 0.185 from the calculation and serial monitor of Arduino. Cooler mirrors have a very important function in life today. Cooling serves to inhibit the rate of respiration in foodstuffs such as fruit and vegetable meat can last for a relatively long time. Temperatures that are too high or too low will have an adverse effect on some foods. This food storage refrigeration machine uses 4 separate cabins with different temperatures according to the desired temperature requirements, this system PID controller is implemented to DS18B20 temperature sensor to stabilize the temperature with a different setpoint, DS18B20 sensor value is processed by PID to regulate relays and solenoids with the value of $K_p = 1$, $K_i = 0.01$, $K_d = 0.05$. The camera as a color detector before entering the cabin according to the temperature requirements of each food. Image processing testing from 20 data resulted in 15% error and 85% color reading success rate. From the PID

value produced by the DS18B20 sensor in all cabins, the average difference is 0.185 from the calculation and serial Arduino monitor.

Keywords : *Refrigerator, DS18B20, PID.*