

INTISARI

PENGUNAAN SENSOR CAHAYA BH1750 BERBASIS ARDUINO UNTUK MENYELIDIKI PENGARUH TEGANGAN TERHADAP INTENSITAS CAHAYA PADA LAMPU PIJAR

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Penelitian ini bertujuan untuk menentukan pengaruh tegangan terhadap intensitas cahaya lampu pijar menggunakan sistem sensor cahaya BH1750. Penelitian dilakukan dengan menguji sistem sensor cahaya BH1750 terhadap tiga buah lampu pijar dengan *wattage* 40 W, 60 W, dan 100 W. Sistem sensor cahaya BH1750 tersusun atas modul sensor cahaya BH1750, Arduino Uno R3, LCD 16x2, dan modul *microSD* yang dirangkai pada tutup paralon berdiameter 9,5 cm serta dikalibrasi menggunakan *illuminance meter*. Data penelitian berupa tegangan dari 50 – 140 V dan intensitas cahaya dari ketiga lampu pijar dalam satuan lux. Data tersebut dianalisis menggunakan metode *curve fitting* untuk mendapatkan pola hubungan antara tegangan dan intensitas cahaya lampu pijar. Hasil uji kalibrasi sistem sensor cahaya BH1750 berupa nilai akurasi di bawah 95% saat spektrum cahaya jingga-merah dan di rentang 95 – 99% saat spektrum cahaya kuning-putih. Dari pengujian terhadap lampu pijar disimpulkan bahwa pola hubungan tegangan (x) dan intensitas cahaya (y) dapat didekati dengan persamaan $y = Ax^3 - Bx^2 + Cx - D$. Semakin besar *wattage* lampu pijar maka nilai koefisien A , B , C dan D akan semakin besar.

Kata Kunci : Arduino Uno, Intensitas Cahaya, Sensor Cahaya BH1750, *Curve Fitting*, Lampu Pijar

ABSTRACT

APPLICATION OF ARDUINO-BASED BH1750 LIGHT SENSOR TO INVESTIGATE THE EFFECT OF VOLTAGE ON LIGHT INTENSITY IN INCANDESCENT LAMPS

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This research aims to determine the effect of voltage on the light intensity of incandescent lamps using the BH1750 light sensor system. The study was conducted by testing the BH1750 light sensor system on three incandescent lamps with wattage of 40 W, 60 W, and 100 W. The BH1750 light sensor system consists of a BH1750 light sensor module, Arduino Uno R3, 16x2 LCD, and a microSD module assembled on the paralon lid with a diameter of 9.5 cm and calibrated by an illuminance meter. The data of this research are the voltage from 50 - 140 V and the light intensity in units of lux. The data were analyzed using the curve fitting method to obtain a pattern of the relationship between voltage and light intensity of incandescent lamps. The results of the calibration test of the BH1750 light sensor system are below 95% accuracy when the light spectrum is orange-red and 95 – 99% accuracy when the light spectrum is yellow-white. From testing on incandescent lamps, it is found that the pattern of the relationship between voltage (x) and light intensity (y) can be approximated by the equation $y = Ax^3 - Bx^2 + Cx - D$. The greater the wattage of the incandescent lamp, the greater the coefficient values of A, B, C and D will be.

Keywords: Arduino Uno, Light Intenisty, BH1750 Light Sensor, Curve Fitting, Incandescent Lamp