

IMPLEMENTASI SISTEM RANCANG BANGUN PENERANGAN OTOMATIS LAPANGAN BASKET DI POLITEKNIK NEGERI BENGKALIS

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ABSTRAK

Penerangan yang optimal pada lapangan basket sangat penting untuk kenyamanan dan keselamatan pengguna, terutama pada malam hari. Penelitian ini bertujuan merancang dan mengimplementasikan sistem penerangan otomatis berbasis sensor cahaya (LDR), modul waktu (RTC), dan aplikasi *Blynk* sebagai media kontrol jarak jauh. Sistem dirancang agar lampu menyala otomatis saat intensitas cahaya di bawah ambang batas, serta hanya aktif pada jam operasional (18.00–06.00 WIB) untuk menghemat energi. Pengujian dilakukan terhadap kinerja LDR, RTC, kontrol *Blynk*, dan perhitungan kebutuhan daya penerangan lapangan. Hasil pengujian menunjukkan LDR mampu merespon perubahan cahaya dengan baik, RTC menjaga jadwal nyala/mati lampu secara tepat, dan kontrol manual melalui *Blynk* berjalan tanpa kendala. Berdasarkan perhitungan kebutuhan penerangan, lapangan basket dengan luas 420 m² memerlukan 126.000 lumen atau setara 840 W untuk mencapai 300 lux. Perhitungan kebutuhan daya menunjukkan penggunaan empat lampu LED 200 W menghasilkan total daya 800 W dengan *output* cahaya 112.000 lumen, setara ± 267 lux, yang memenuhi standar pencahayaan lapangan basket luar ruang kategori rekreasi.

Kata kunci: Penerangan otomatis, LDR, RTC, *Blynk*, IoT, lapangan basket, perhitungan penerangan dan daya.

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ABSTRACT

Optimal lighting on a basketball court is crucial for user comfort and safety, especially at night. This study aims to design and implement an automatic lighting system based on a light sensor (LDR), a time module (RTC), and the Blynk application as a remote control medium. The system is designed to automatically turn on the lights when the light intensity is below the threshold, and is only active during operational hours (6:00 PM–6:00 AM WIB) to save energy. Tests were conducted on the performance of the LDR, RTC, Blynk control, and the calculation of the field's lighting power requirements. The test results showed that the LDR was able to respond well to changes in light, the RTC maintained the lights on/off schedule accurately, and manual control via Blynk ran smoothly. Based on the lighting requirements calculation, a 420 m² basketball court requires 126,000 lumens or the equivalent of 840 W to achieve 300 lux. Power requirements calculations show that using four 200W LED lamps produces a total power of 800W with a light output of 112,000 lumens, equivalent to ± 267 lux, which meets the lighting standards for recreational outdoor basketball courts.

Keywords: *Automatic lighting, LDR, RTC, Blynk, IoT, basketball court, lighting and power calculations.*