

ABSTRAK

RANCANG BANGUN RECEIVER SKUTER SEPEDA LISTRIK DENGAN SYSTEM SMART SECURITY BERBASIS INTERNET OF THINGS (IoT) MENGUNAKAN LONG RANGE (LoRa)

(2025 : xvii + 70 Halaman + 28 Gambar + 5 Tabel + Lampiran)

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Perkembangan teknologi Internet of Things (IoT) telah mendorong inovasi dalam berbagai sektor, termasuk transportasi ramah lingkungan seperti skuter sepeda listrik. Meskipun efisien dan praktis, kendaraan ini masih menghadapi tantangan keamanan seperti risiko pencurian dan kurangnya sistem pengawasan. Proposal ini mengusulkan rancang bangun sistem smart security berbasis IoT untuk skuter sepeda listrik, yang mengintegrasikan fitur GPS Tracking, kontrol jarak jauh, dan penguncian elektrik. Sistem ini menggunakan teknologi komunikasi LoRa yang dikenal hemat daya dan mendukung transmisi jarak jauh, menjadikannya ideal untuk aplikasi kendaraan portabel. Prototipe dikembangkan menggunakan mikrokontroler ESP32, modul GPS, relay, dan berbagai komponen pendukung lainnya, dengan kendali melalui antarmuka aplikasi Android. Hasil yang diharapkan dari proyek ini mencakup peningkatan keamanan skuter listrik, kemudahan pemantauan lokasi secara realtime, serta pengoperasian sistem yang responsif dan hemat energi. Rancang bangun ini diharapkan dapat menjadi solusi inovatif dalam pengembangan kendaraan listrik berbasis IoT dengan sistem keamanan cerdas dan efisien..

Kata Kunci: *Internet of Things, Smart Security, Skuter Sepeda Listrik, GPS Tracking, LoRa, ESP32*

ABSTRACT

DESIGN OF ELECTRIC BIKE SCOOTER RECEIVER WITH SMART SECURITY SYSTEM BASED ON INTERNET OF THINGS (IoT) USING Long Range (LoRa)

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The development of Internet of Things (IoT) technology has driven innovation in various sectors, including environmentally friendly transportation such as electric bicycle scooters. Although efficient and practical, these vehicles still face security challenges such as the risk of theft and lack of surveillance systems. This proposal proposes the design of an IoT-based smart security system for electric bicycle scooters, which integrates GPS Tracking, remote control, and electric locking features. This system uses LoRa communication technology which is known to be energy efficient and supports long-distance transmission, making it ideal for portable vehicle applications. The prototype was developed using an ESP32 microcontroller, GPS module, relay, and various other supporting components, with control via an Android application interface. The expected results of this project include increased security of electric scooters, ease of real-time location monitoring, and responsive and energy-efficient system operation. This design is expected to be an innovative solution in the development of IoT-based electric vehicles with intelligent and efficient security systems.

Keywords : Internet of Things, Smart Security, Electric Bike Scooter, GPS Tracking, LoRa, ESP32