

ABSTRAK

**PERANCANGAN SISTEM OTOMATISASI SMART HOME
BERBASIS ESP32 UNTUK MONITORING PERANGKAT
ELEKTRONIK SECARA OTOMATIS MELALUI APLIKASI
BLYNK**

Kemajuan teknologi Internet of Things (IoT) memberikan peluang besar dalam penerapan sistem rumah pintar atau smart home. Penelitian ini merancang dan membangun sistem smart home berbasis mikrokontroler ESP32 yang mampu memonitor dan mengendalikan perangkat elektronik secara otomatis dan jarak jauh. Sistem menggunakan tiga jenis sensor utama, yaitu sensor gas (MQ-5), sensor suhu dan kelembaban (DHT22), serta sensor api (flame sensor), yang terhubung ke ESP32 sebagai pusat kendali. Aktuator berupa buzzer, kipas mini DC, dan motor mini dc dikendalikan melalui modul relay. Data dari sensor ditampilkan melalui layar OLED secara lokal dan dikirim ke aplikasi Blynk untuk monitoring dan notifikasi real-time. Pengujian menunjukkan bahwa sistem mampu merespons dengan baik terhadap kondisi darurat seperti kebocoran gas, suhu tinggi, dan keberadaan api, baik secara otomatis maupun saat dikontrol jarak jauh. Sistem juga tetap dapat berjalan secara offline ketika koneksi internet terputus.

Kata Kunci: Smart Home, ESP32, IoT, Blynk, Otomatisasi

ABSTRACT

**DESIGN OF SMART HOME AUTOMATION SYSTEM BASED
ON ESP32 FOR AUTOMATIC MONITORING OF
ELECTRONIC DEVICES THROUGH BLYNK APPLICATION**

The advancement of Internet of Things (IoT) technology provides great opportunities in the implementation of smart home systems. This research designs and builds a smart home system based on the ESP32 microcontroller that can automatically and remotely monitor and control electronic devices. The system uses three main types of sensors, namely gas sensor (MQ-5), temperature and humidity sensor (DHT22), and flame sensor, which are connected to the ESP32 as the control center. Actuators in the form of buzzers, mini DC fans, and mini DC motors are controlled through relay modules. Data from the sensors is displayed on an OLED screen locally and sent to the Blynk app for monitoring and real-time notifications. Testing shows that the system responds well to emergency conditions such as gas leaks, high temperatures, and the presence of fire, both automatically and when controlled remotely. The system can also continue to operate offline when the internet connection is lost.

Keywords: Smart Home, ESP32, IoT, Blynk, Automation