

Fire Alert System using ESP32

This project is a real-time fire detection and alert system built using an ESP32 microcontroller, an IR flame sensor, and IoT platforms like Blynk and Google Sheets. It provides instant alerts via a mobile application and logs fire events to the cloud for further monitoring and analysis.

Features

- Real-time fire detection using a flame sensor
- Visual alert using an LED
- Audible alert using a buzzer
- Remote notification using the Blynk mobile app
- Logs fire detection data into Google Sheets using Webhooks
- Easy to deploy and cost-effective

Components Used

Component	Quantity
ESP32 Dev Board	1
IR Flame Sensor	1
LED	1
Buzzer	1
Breadboard	1
Jumper Wires	As required
Power Supply (5V)	1

Pin Connections

Component	Component Pin	ESP32 Pin	Description
Flame Sensor	OUT	GPIO 18	Reads fire presence (LOW = fire)
LED	Anode (+)	GPIO 19	Lights up when fire is detected
Buzzer	+	GPIO 21	Buzzes when fire is

			detected
All Components	GND	GND	Common ground
All Components	VCC	3.3V/5V	Power supply

Software Requirements

- Arduino IDE
- Blynk IoT App (Android/iOS)
- Google Account with Apps Script for logging
- Blynk Libraries (BlynkSimpleEsp32.h)
- WiFi credentials

Setup Instructions

- Install Arduino IDE and add ESP32 board support.
- Install Blynk Library using Library Manager.
- Create a Blynk Template: Note your BLYNK_TEMPLATE_ID, BLYNK_TEMPLATE_NAME, and BLYNK_AUTH_TOKEN.
- Deploy Google Apps Script for logging and copy the Web App URL.
- Upload the provided code to ESP32 after updating Wi-Fi, Blynk credentials, and Web App URL.
- Monitor the system using Serial Monitor.

Working Principle

The flame sensor continuously monitors for infrared radiation. When a fire is detected, the sensor outputs a LOW signal. The system responds by activating the LED and buzzer for visual and audible alerts, sends a notification to the Blynk app, and logs the data to Google Sheets. When no fire is detected, the system updates the status and clears alerts accordingly.

Result

The Fire Alert System provides instant notifications through the Blynk app, visual alerts via the LED, audible alerts via the buzzer, and maintains historical data of fire events using Google Sheets. This ensures effective monitoring and response to fire hazards.

