

# **Fleet Management System**

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**Abstract:** *The ESP32-based Fleet Management System offers an IoT solution for smart vehicle tracking and fleet control. It uses several sensors, including RFID for driver authentication, GPS for location tracking, an MPU6050 for motion and tilt detection, and an ultrasonic sensor for monitoring fuel levels. The ESP32 microcontroller serves as the main processing unit. It collects and sends sensor data to the Firebase Realtime Database through Wi-Fi. RFID verification ensures secure trip access. Parameters like throttle, brake, fuel level, and vehicle orientation update every second. A web-based dashboard delivers real-time analytics, route visualization, and management tools. Experimental testing showed 99.7% system uptime, high accuracy in sensor data, and robust cloud synchronization. The system's modular and scalable design suits both individual vehicle tracking and large-scale fleet operations.*

**Keywords:** ESP32, Fleet Management System, IoT, GPS Tracking, RFID Authentication, Firebase, Vehicle Monitoring, Real-Time Dashboard

