MIT Academy of Engineering
(An Autonomous Institute Affiliated to Savitribai Phule University)

SCHOOL OF ELECTRONICS AND TELECOMMUNICATION

Vehicle Safety Monitoring System Using CAN Protocol

Research Motivation

- Enhancing Automobile Safety
- Addressing Real Time Communication Issues
- Reducing Accidents
- Storing Vehicle Parameters
- Safety

Summary of Literature Survey

CAN bus configuration
Monitor critical parameters
Real-time alerts
Focuses on enhancing safety

Scope

- Vehicle Black Box Functionality
- Automation Industry Focus
- Real-time Data Collection
- Real Time Communication

Aim

To utilize CAN Protocol for seamless and real-time communication within different ECU's of vehicle to prevent accidents , improve road safety and store vehicle parameters .

Objectives

- To establish Real-time communication between LPC2148 and Atmega328SMD.
- To design a system for responding to emergency situation.
- To develop the driver assistance features.
- To send safety parameters to owner via GSM and ESP8266.

Hardware Specification

ATMEGA328 SMD, LPC2148, DC motor, ESP8266, GPS, GSM, Vibration Sensor, Switch, LCD, Temperature Sensor, Motor Driver, Relay, MCP2515.

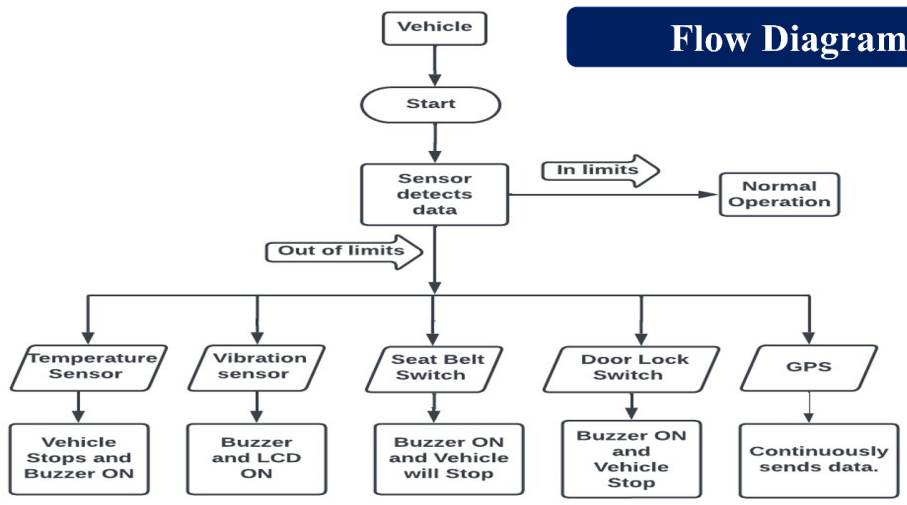
Software Specification

- FOR ATMEGA 328 SMD :
  Software : ARDUINO IDE
- FOR LPC 2148 :
  Software : Keil, Flash magic
- For Graphical Representation of Data :
  ThingSpeak cloud service

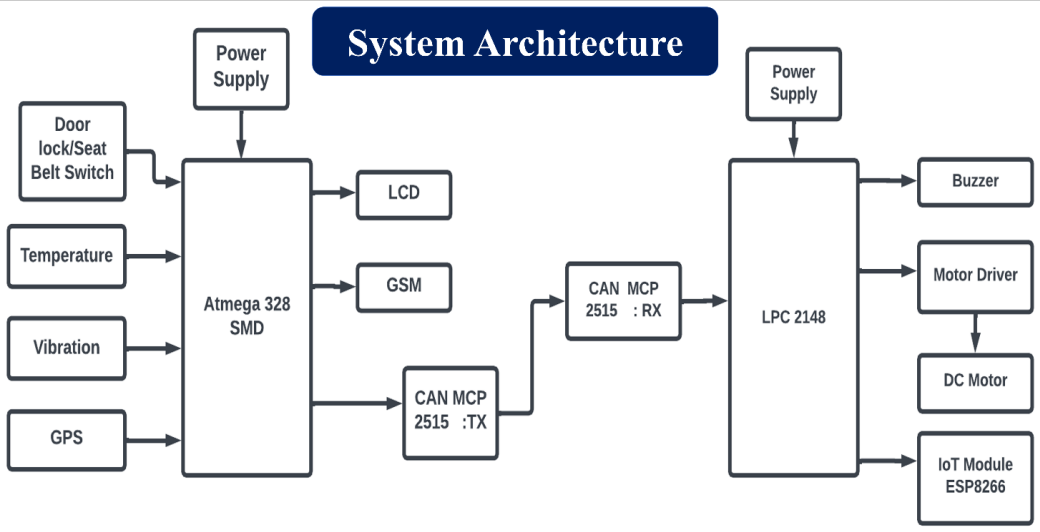
Methodology

- System Design
- CAN Protocol Study
- Sensor Integration
- Microcontroller and Interfaced Selection
- CAN Message Structure
- Data Processing and Analysis
- Testing and Validation
- Performance Analysis
- Integration with Vehicle Systems
- Improvements

Flow Diagram



System Architecture



Expected Result

- Real-time Communication between ECU's .
- Accident Prevention system.
- Emergency Protocols implementation and SMS alert using GSM.
- Graphical representation of parameters on Thingspeak.

References

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3.Pradhan Suvendu Kedareswar, Venkatasubramanian Krishnamoorthy, " Can Based Protocol Based Embedded System To Avoid Rear-End Collision Of Vehicles" , Communication and Computing ARTCom Technologies, *IEEE* 2021.

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