SMART BLACK BOX WITH SMS ALERT FOR ROAD VEHICLES

AIM:

Design and development of Smart black box with SMS alert for road vehicles using Arduino.

PURPOSE:

Road accidents are a significant cause of fatalities and injuries worldwide. To enhance road safety and improve accident investigation processes, this paper proposes the design and implementation of a smart black box system with SMS alerts for road vehicles. The smart black box is an advanced on board device that collects and records various data related to vehicle operation, such as speed, acceleration, braking, and GPS location. The system integrates cutting-edge technologies, including sensors, microcontrollers, and wireless communication modules, to capture real-time data and store it securely in a black box unit within the vehicle. In the event of an accident, the smart black box automatically detects the impact and initiates an SMS alert to predefined emergency contacts, providing them with crucial information about the incident and the vehicle's location. This proposed project title is smart black box with SMS alert for road vehicles using Arduino.

DESCRIPTION:

GSM (SIM800C) and GPS (NE06) connected with Arduino UART port. DHT11 sensor, Alcohol sensor, MEMS (ADXL345) sensor and limit switch interfaced to Arduino digital pins.

WORKING:

Arduino reads temperature and humidity values with the help of DHT11 sensor. MEMS sensors measures vehicle inclinations while moving. Limit switch arranged in front of vehicle and it will detect accident impact. Alcohol sensor identifies alcohol presence inside the vehicle and at driver. If any sensor gets activated then Arduino sends SMS along with GPS location.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontroller	:	Arduino Uno
Crystal	:	16 MHz
LCD	:	16x2 LCD display
GSM Module	:	SIM800C
GPS Module	:	NE06
Alcohol Sensor	:	MQ4
Accelerometer	:	ADXL345
Temperature sensor	:	DHT11
Humidity sensor	:	DHT11
Accident Detection Sensor	:	Limit switch
Power Source	:	12v 1 amp DC adaptor

SOFTWARE:

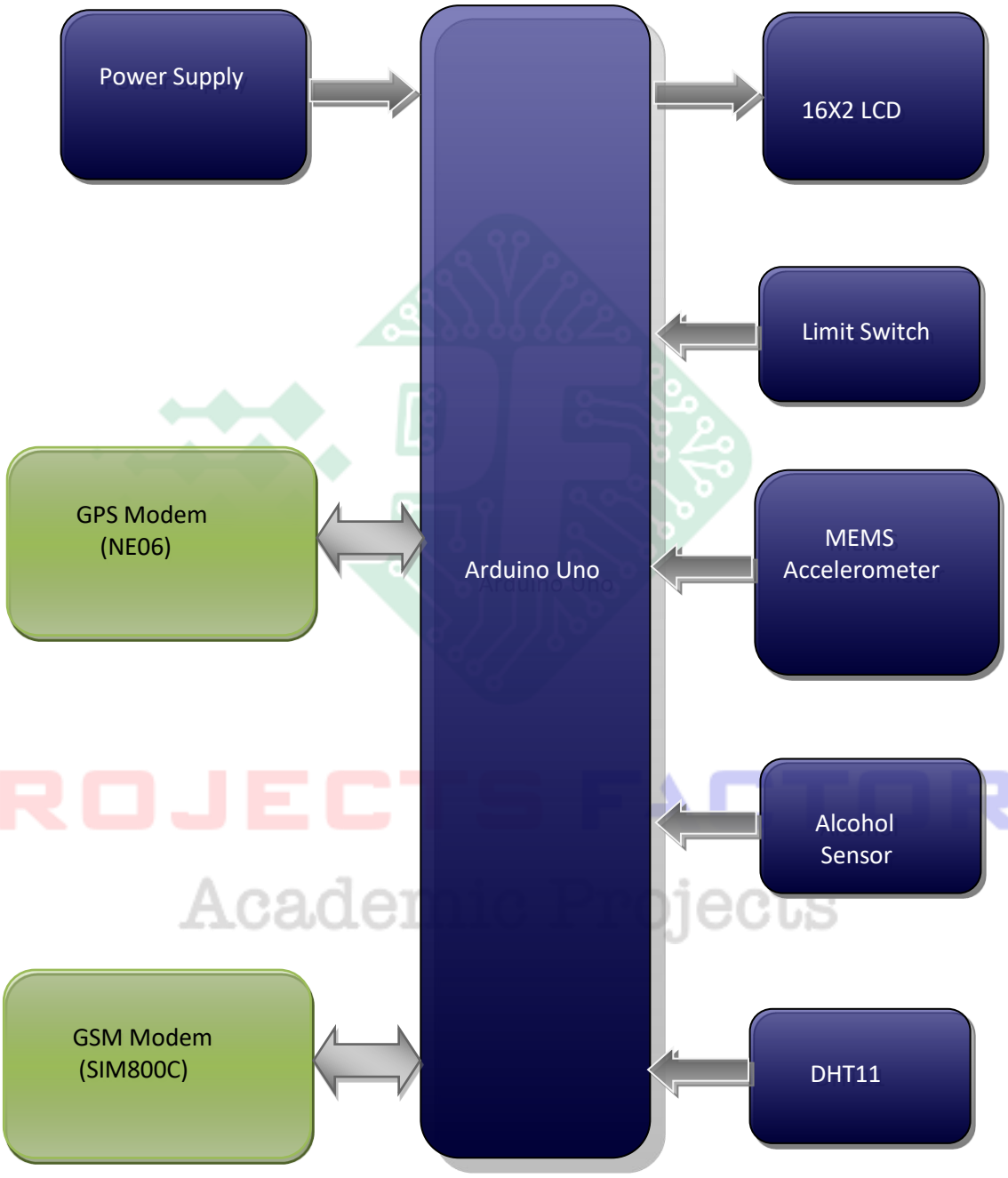
Arduino IDE

Proteus based circuit diagram

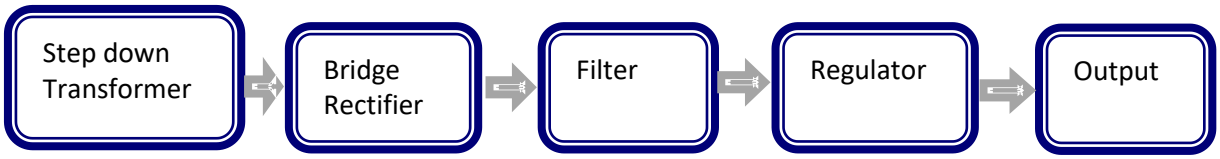
APPLICATIONS:

- Vehicle Accident detection
- Vehicle black box
- GSM GPS vehicle tracking
- Automatic vehicle accident detection
- Car accident and alcohol detection

BLOCK DIAGRAM:



POWER SUPPLY BLOCKDIAGRAM:



INTERFACES COVERD:

- We have covered Arduino programming
- GSM and GPS interface
- DHT11, limit switch, MEMS and alcohol sensors interface