KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE-WARANGAL
(An AUTONOMOUS Institute under Kakatiya University-Warangal)
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

U18EE610: MINI PROJECT

Presentation

on

ZIGBEE BASED VEHICLE ACCESS CONTROL AND PROTECTING SYSTEM

Mini project Guide
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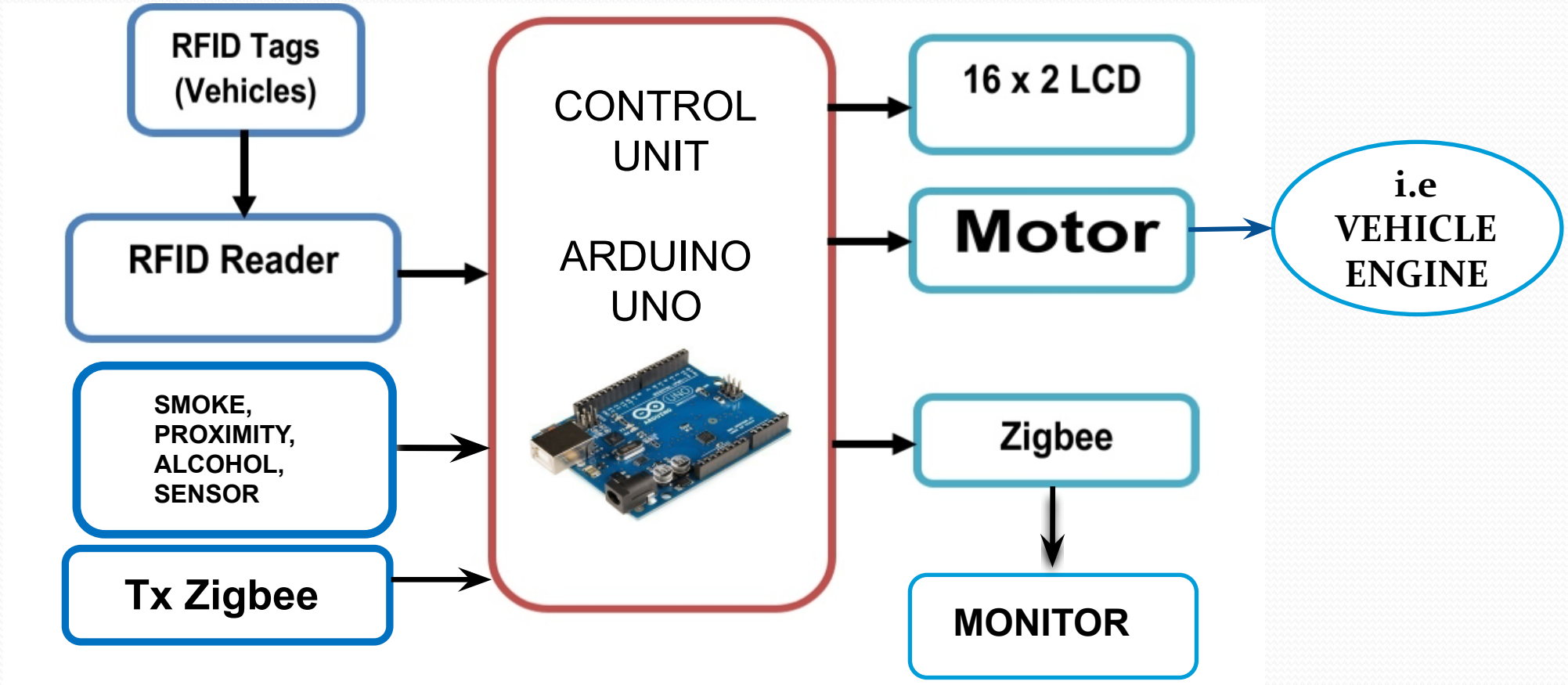
Abstract :

- There are many automobile manufacturing companies in india. Many new models of vehicles are being manufactured. All these manufacturers shows interest of luxury mainly but not on safety. Current driver assistance systems are based on a number of technologies, such as radar, computer vision and sensors. Integrating all of these technologies into a single system is normally a costly and complex solution.
- I propose a complete Zigbee and RFID based driver assistance system solution that leverages the cost-effective, safety to passengers, low power and secure wireless networking features. By zigbee we can transfer data very fast and reliable.
- This project gives protection to vehicle driver and passengers in all aspect like vehicle accessing using RFID tag, smoke detection in engine, sudden obstacle

BLOCK DIAGRAM



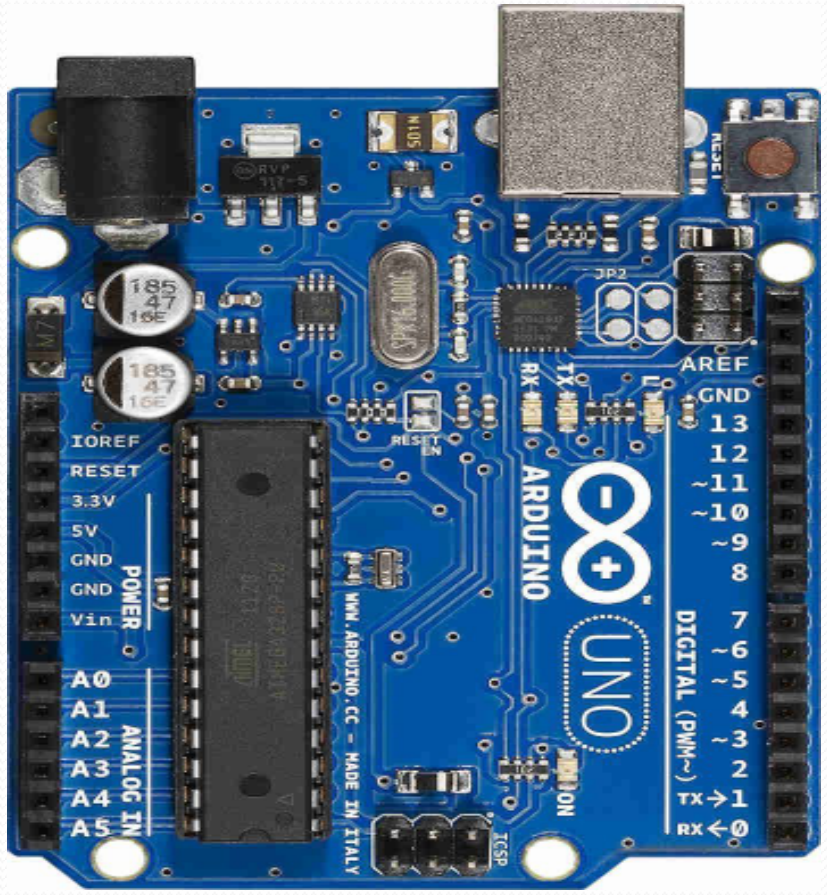
WORKING PRINCIPLE :

- When the authorized RFID tag brought near to the reader, reader detects the card and switch ON the relay so that engine get started.
- When the vehicle came near to gate, Zigbee module transmit the data to receiver, so that it check for authorized identity and gives permission by displaying in monitor and opening the gate.
- A Smoke sensor was placed in engine and connected to Arduino. So when there is abnormal condition on engine, Smoke gets detected and indication was given to driver through LCD displaying “smoke detected” and switches the buzzer.
- Proximity sensor was placed in front of vehicle and When a obstacle or person came across suddenly, it gives indication and alert the driver through buzzer.
- Alcohol sensor was placed near the steering. It reads the amount of alcohol consumed and if it is above the limited value, it starts indicating through LCD displaying “*alcohol detected*” and switches the buzzer.

COMPONENTS

ARDUINO UNO :

- Arduino Uno is an open source microcontroller board based on microchip ATmega328P microcontroller.

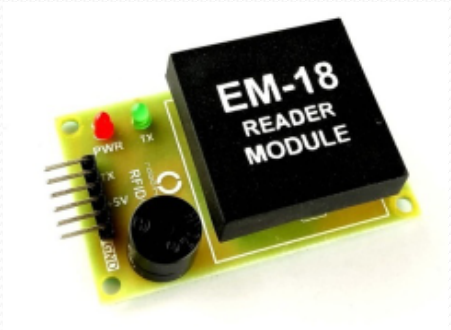


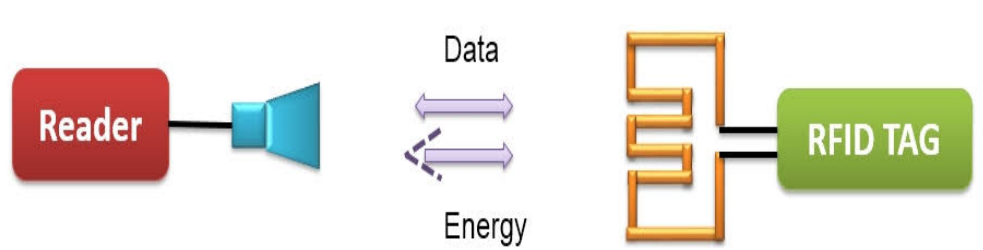
Specifications:

- Operating voltage : 5V
- Analog pins : 6
- Digital pins : 14
- RAM : 2KB
- ROM : 32 KB
- Clock speed : 16Mhz

RFID READER AND TAG

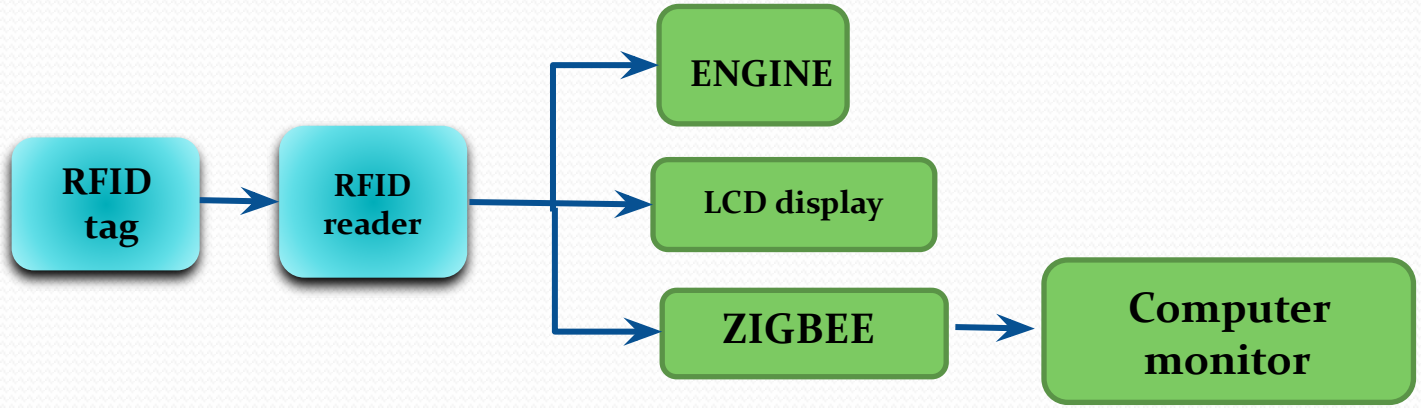
- Radio frequency identification , is a wireless system consisting of two components ***READER*** and ***TAG***.





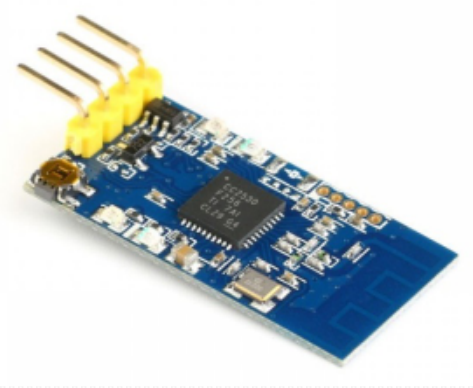
SPECIFICATIONS :

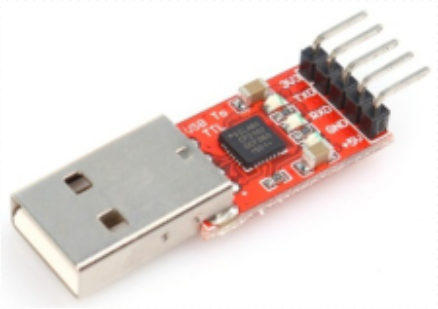
- operating voltage : 5V
- operating frequency : 125Khz
- reading distance : max 10 cm



ZIGBEE MODULE

- Zigbee is a wireless communication protocol generally used for line of sight communication applications.

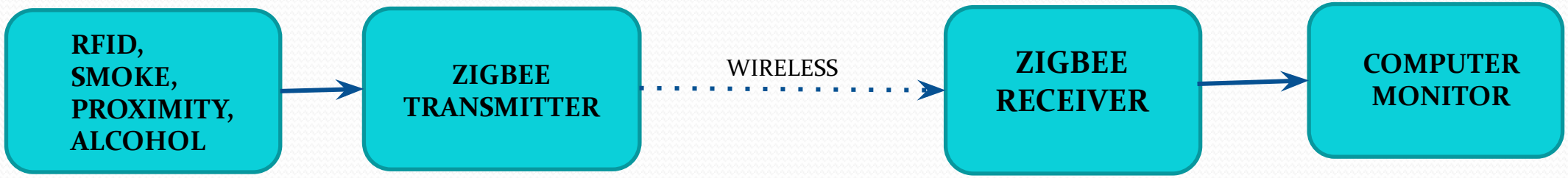




Transmitter Specifications :

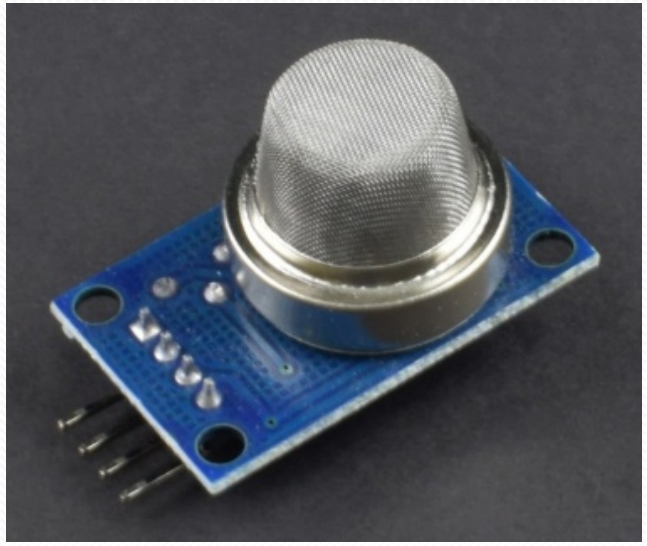
- Operating frequency : 2.4Ghz
- Operating voltage : 5V
- Operating range : 10 - 250 m

ROLE IN PROJECT: It transmit the data of circuit to receiver and display on computer monitor



SMOKE SENSOR

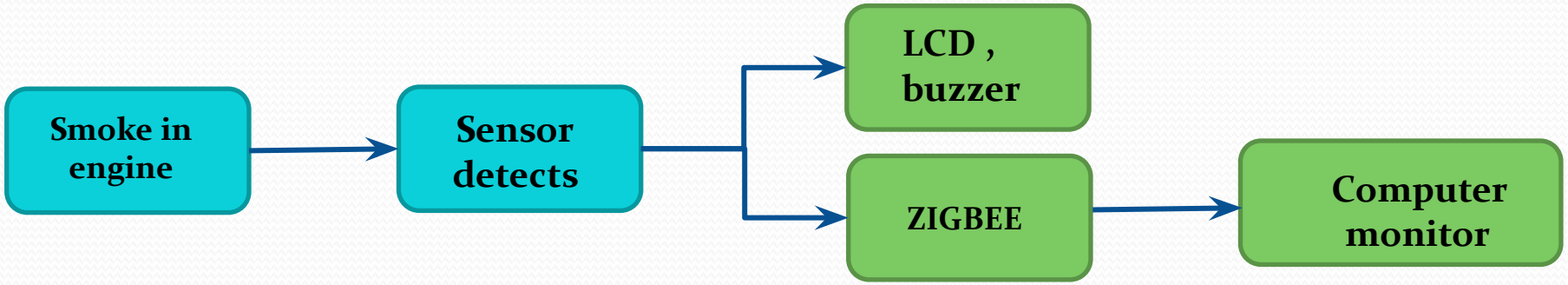
- A smoke sensor is used to sense the smoke around it, and gives the information to arduino. So that it switches the buzzer to indicate presence of smoke.



SPECIFICATTIONS :-

- Model : MQ2
- Operating voltage :- 5V
- Concentration :- 200 to 1000ppm
- Can sense:- methane, smoke and LPG

ROLE IN PROJECT : It was placed in engine and whenever there is a smoke in engine, it detects and pass the information to LCD, zigbee and buzzer



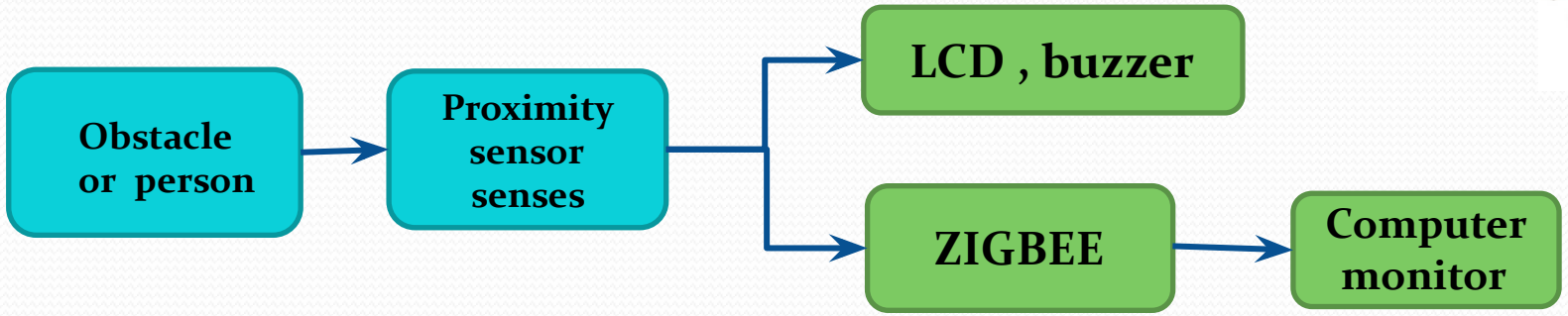
PROXIMITY SENSOR

- A IR proximity sensor is used to detect the obstacles in front of it.

- **SPECIFICATTIONS:-**
  - operating voltage :- 5V
  - Distance :- 2 to 30cm

ROLE IN PROJECT :

- Sensor was placed in front of vehicle. So whenever there is obstacle or person in front of vehicle, it detects and passes information to LCD and shows in computer monitor



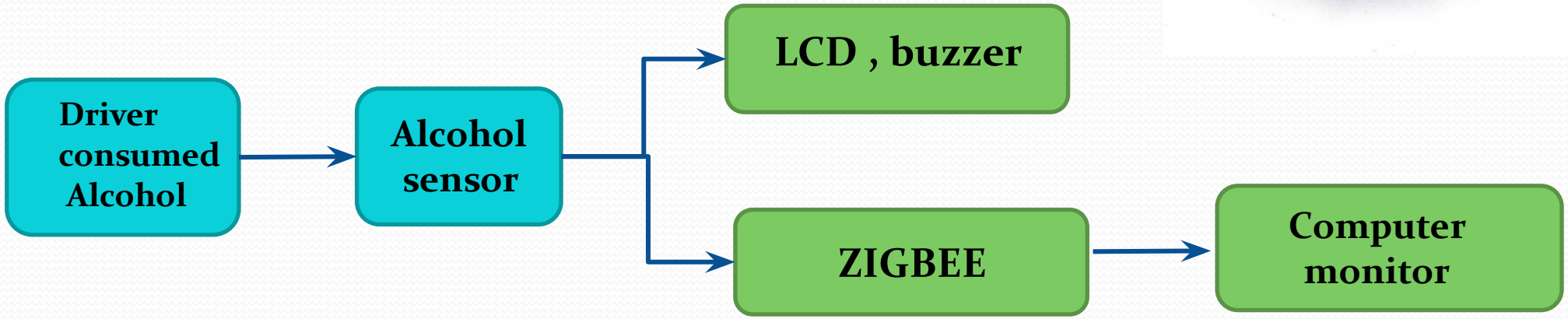
ALCOHOL SENSOR

- Alcohol sensor senses the alcohol quantity in air and gives the information to Arduino Uno.

SPECIFICATIONS :-

- Operating voltage :- 5V
- Concentration :- 0.05 -10 mg/L
- Fast response and high sensitivity.
- Model : MQ-3

ROLE IN PROJECT :- It was placed near the steering. So that whenever the driver consumed alcohol and try to drive the vehicle. It detects alcohol and passes information to LCD display , buzzer and computer monitor through zigbee.



RESULT :-

- Authorized RFID tag can only access the vehicle and can start the engine (DC motor).
- Zigbee transmit the status of vehicle and dispalyed the status on computer monitor.
- Any obstacle in front of vehicle got detected. And information displayed in LCD and computer monitor.
- If driver consumed alcohol, then sensor detects. And status displayed in LCD and computer monitor.
- If any smoke in engine it gets detected. And status displayed in LCD and in computer monitor.

HOW IS IT USEFUL TO SOCIETY

Even our automobile industries are developing day by day , there was not much development in protection of vehicle from accidents. For every hour there was 53 road crashes in india. Which is highest among the world. So this project may help in decreasing these road accidents , such as

- Drunk and drive accidents can be reduced.
- Sudden accidents, like person or a vehicle coming in front.
- Vehicle break down due to abnormal conditions and vehicle fire accidents can be detected.
- Thefting of vehicle can be avoided.

CONCLUSION :-

- The project "**ZIGBEE BASED VEHICLE ACCESS CONTROL & PROTECTING SYSTEM**" has been successfully designed and working model was tested. Project has high capabilities of detecting drunk and drive situations, Authorized vehicle identity gate opening system, RFID based vehicle accessing and engine starting , Detecting abnormal conditions of engine like smoke detecting, detecting obstacles in front of vehicle and indication. By all this work it can be concluded that the project provides a secure and protected system for automobiles.

FUTURE SCOPE:

Present project deals about the sensing of the accident causing conditions only

- we can develop a automatic braking system which works with the proximity detection.
- A GSM based messaging system can be developed to send message to family members, when ever the person consumed alcohol and driving the vehicle. And we can also track him.
- A system which sends location to family members, when the vehicle breakdown.
- We can make the RFID tag even small and flexible such as a braclet, ring mobile cover etc

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- "Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti (Universities Press)
- Electronic Components -D.V.Prasad

THANK YOU