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IOT BASED TRAIN ACCIDENT AND LOCATION TRACKING SYSTEM

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Abstract: This project is to design and implement the smart train Black box system for train accident and security system. The rapid rise of technology and infrastructure has made our lives easier. The high demand of automobiles has also increased the traffic hazards and road accidents. Life of the people is under high risk. The delay in reaching of the ambulance to the accident location and the traffic congestion in between accident location and hospital increases the chances of death of the victim. This proposed IOT based accident detection system helps to reduce the loss of life due to accidents and also reduces the time taken by the ambulance to reach the hospital. To detect the accident there is accelerometer sensor present in this rescue system and the IOT module included sends messages about the location to the respective guardian and rescue team. This automatic ambulance rescue system project is useful in detecting the accident. The sensor will work as a providing security to the owner who is inside the train.

Keywords: IDE**,** LDO**,** RST, DIP Black box system.

I. INTRODUCTION

The Internet of Things (IoT) is the physical network of things or objects devices, buildings, trains, and other items embedded with electronics, software, sensors, and network connectivity that enables these things or objects to collect and exchange data. An anti -theft system is any device or method used to prevent or deter the unauthorized appropriation of items that is considered valuable. Internet of Things is expected to produce high degree of human to machine communication along with machine-to-machine communication. The primary objective of this project is to reduce human work. Automation has always been a prime factor for security system. Our aim in the project is to design and implement a security system. System that offers controllability through a hand-held mobile phone by means of IOT. In today's world where science has made amazing advances so have the recent trains. These trains are more advanced than ever. They have more speed, state of the art engines and are very closely to these reasons there is a need to adapt a device which can continuously monitor all the various parameters of train. We have design such a system which, in case of accident will records all the parameters and also help us to prevent any accident to happen in certain extends the project is developed to record informational data, such as: temperature of the engine (30 seconds before), alcohol level, gas leakage level, etc. to revolutionize the field of motor train accident investigation.

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II. PROPOSED SYSTEM

The unavailability of the precise methods for accident occurrence detection beside to a reliable locating tool with a quick reporting feature is the major problem under the research. Due to the delay in the arrival of ambulance to the accident spot it causes the loss of human life. So, it is necessary to take the accident victim to the hospital as early as possible. Proposes combine independent and complementary solutions in a global accident detection system to provide stable and accurate positioning of train accident even in severe urban environments. The proposed solutions consist of augmenting the navigation solution exploiting the inertial sensor to estimate the dynamics of train to extract the accident. Develop a system that offers security to the train using Internet of Things (IOT). The system must be able to do user authentication for access control and monitor the train furan suspicious activity. It must keep the train secured by notifying the user via SMS in case of any unauthorized access, theft, intrusion, and towing.

WORKING PRINCIPLE

Micro-Electro-Mechanical Systems (MEMS) is that the integration of mechanical parts, sensors, actuators, and natural philosophy on a typical element substrate through small fabrication technology. In most cases, the physics behind the behavior of MEMS devices are often expressed by mathematical expressions. MEMS work by making a mathematical

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model of the system and generate analytical solutions to clarify the behavior of the MEMS device. The user simply should enter the input parameters like length and breadth of the beam for instance during a user-friendly GUI, and also the code can now calculate the relevant results and plot graphs that totally make a case for the MEMS device or a part of it. The code is split into 5 modules particularly mechanics, sensing, actuation, and method and knowledge analysis. Mechanics module is divided into 3 sub sections.

The primary subdivision being structures wherever the foremost ordinarily used beams and diaphragm styles are examined. The second subdivision discusses vibration of those structures, each free and compelled vibration. The third subdivision discusses damping within the type of squeeze film and slide film damping. Sensing module discusses sensing schemes wide utilized in MEMS particularly piezoresistive and electrical phenomenon sensing for planning pressure sensors and accelerometers. Exploit module examines the 2 wide used means that of exploit particularly electricity and thermal applied to some ordinarily used actuators like parallel plate, small mirror, comb drive, bimetallic and bimorph actuators. Method module is split into six subsections particularly lithography, oxidation, diffusion, implantation, film deposition and wet etching.

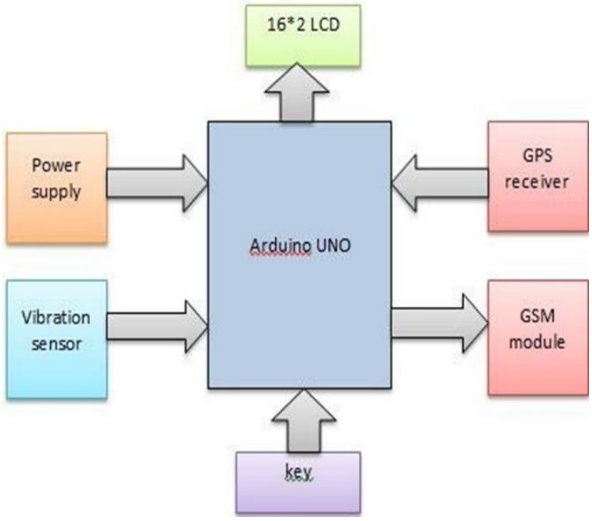

Fig. 1 Proposed System

III. SYSTEM ARCHITECTURE & MATERIALS AND METHODS

All other components like the ultrasonic sensor, accelerometer and GPS and IOT modules are connected via at mega 162microcontroller. The code for the working of this system is written in C. The LCD screen displays short messages to keep track of the working of the system.

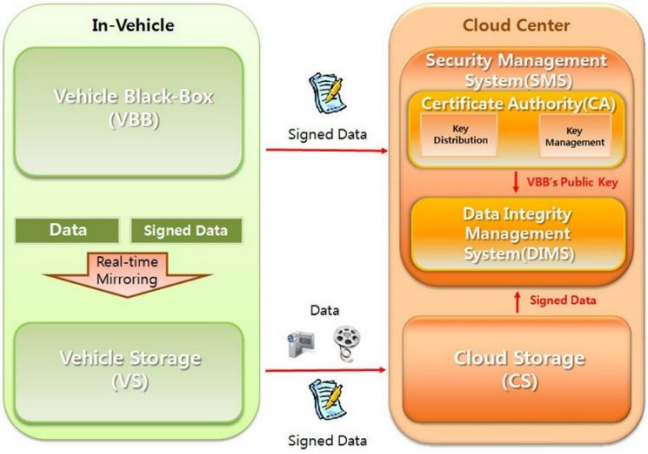

Fig. 2 System Architecture

REGULATED POWER SUPPLY

In most of our electronic products or projects we need a power supply for converting mains AC voltage to a regulated

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DC voltage. For making a power supply designing of each and every component is essential. Here I'm going to discuss the designing of regulated 5V Power Supply. A step-down transformer will step down the voltage from the ac mains to the required voltage level. The turn's ratio of the transformer is so adjusted such as to obtain the required voltage value. The output of the transformer is given as an input to the rectifier circuit.

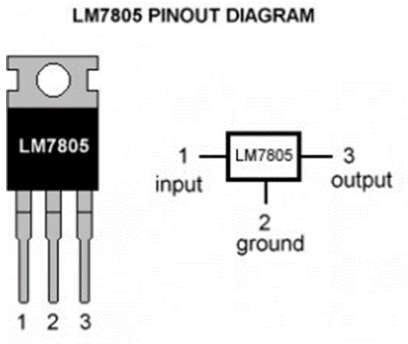

Fig. 3 LM7805 Pin Diagram

A regulated power supply is very much essential for several electronic devices due to the semiconductor material employed in them have a fixed rate of current as well as voltage. The device may get damaged if there is any deviation from the fixed rate. The AC power supply gets converted into constant DC by this circuit. By the help of a voltage regulator DC, unregulated output will be fixed to a constant voltage. Regulated power supply is the main component of electrical, electronics and as well as automation equipment.

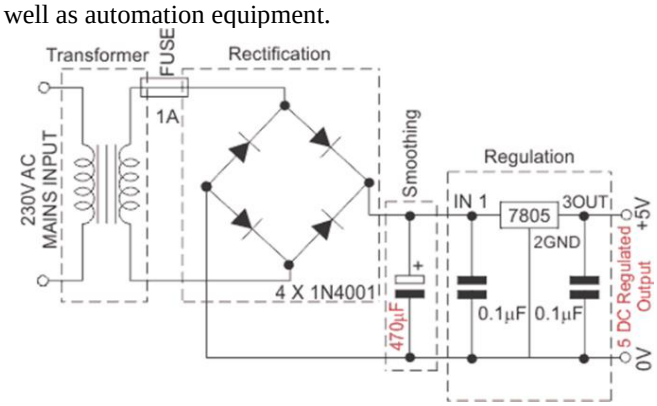

Fig. 4 Regulated power supply

GAS SENSOR

Gas detectors can be classified according to the operation mechanism (semiconductors, oxidation, catalytic, infrared, etc.). Gas detectors come in two main types: portable devices and fixed gas detectors. The first is used to monitor the atmosphere around personnel and is worn on clothing or on a belt/harness. The second type of gas detectors are fixed type which may be used for detection of one or more gas types. Fixed type detectors are generally mounted near the process area of a plant or control room. Generally, they are installed on fixed type mild steel structures and a cable connects the detectors to a SCADA system for continuous monitoring and where a tripping interlock can be activated for an emergency situation.

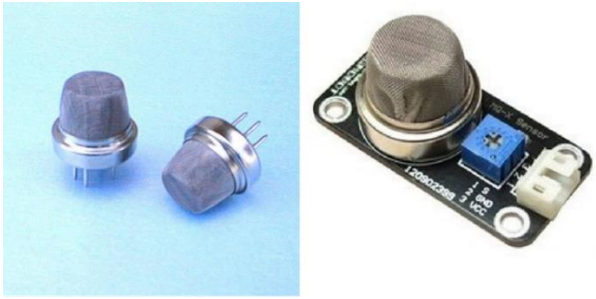

Fig. 5 Gas Sensor

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RELAY

Relays are electrically operated switches. They are used to control a circuit by a separate low-power signal or to control several circuits with one signal. The three main types of relays are electromechanical, solid-state, and reed. This overload protection relay reacts to overheating. A relay allows circuits to be switched by electrical equipment: for example, a timer circuit with a relay could switch power at a present time.

Fig. 6 Relay

IOT MODULE

An **IOT MODULE** is a small electronic device embedded in objects, machines, and things connected to wireless networks and sends and receives data.

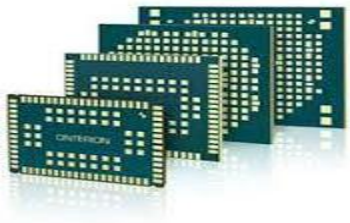

Fig. 7 IOT module

GLOBAL POSITIONING SYSTEM

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver. The GPS project was developed in 1973 to overcome the limitations of previous navigation systems, integrating ideas from several predecessors, including a number of classified engineering design studies from the 1960s. GPS was created and realized by the U.S. Department of Defense (DoD) and was originally run with 24 satellites. It became fully operational in 1995.

IV. RESULT AND DISCUSSION

The system detects accident from a train and send message through IOT module. The message is received by another IOT module. GPS Module track the exact location of the accident, hence there is small variation in the coordinates, initial value of latitude and longitude are same but fractional value changes with small difference. At the simulation we tread the GPS and IOT modules with Virtual terminal, it acts same as the modules work with more efficient at blynk program. We connect the vibration sensor in the simulation with a variable resistance to control vibrate level

V. CONCLUSION

The proposed system is developed to provide the information about the accident occur and the location of the accident. It helps to easily provide the assistant and help to the victim of the accident. This system uses GPS module to locate the train. IOT is used to provide the information of accident. The results of the proposed systems are satisfactory. Further this system can be implemented by using sound sensor, in order to make it more accurate and efficient to detect an accident. This is extended with alcoholic detection also. If the person who is driving took alcohol, then the train will be stopped immediately by giving alarm

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