

# IOT BASED SMART VEHICLE BLACK BOX WITH SECURITY SYSTEM

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**Abstract** -This prototype can be designed with least number of circuits. The SBBSS can contribute to constructing safer vehicles, improving the treatment of crash victims, helping insurance companies with their vehicle crash investigations, and improve road status in order to decrease the death rate. As the amount of vehicle grows rapidly, vehicle theft has become a shared concern for all citizens. Security and safety have always become a necessity for population. However, present anti-theft systems lack the tracking and monitoring function. Internet of things (IOT) has been governing the electronics era with cloud services dominating the ever-increasing electronics product segment. Thus, there is a need to develop a system for providing security as well as storing the data of Vehicle. The vehicle from problems like theft and towing using IOT for security of automobiles and passengers. The user can control the engine/ignition and turn it off if needed. The prototype also provides a solution to the problem like Towing and theft. Thus, the system uses Bluetooth module and controller to control the security system from the user's mobile phone by means of any device with a potential Internet connection. It also provides the 24\*7 Vehicle tracking using Google map. This helps the user to track the vehicle in case of towing or in case of theft. The results of SVBBS system were promising in terms of proficiently detecting the accidents, finding the seriousness of accident and also detecting the location of vehicle. It is the advanced system which includes the security system. we Can able to switch OFF/ON the engine through the Mobile App. We can able to track our vehicle 24\*7.

**Key Words:** IOT, Arm, Sensors, Theft, Touch display, Smart vehicle, Gsm, Gps, Embedded.

## 1. INTRODUCTION

In this world, all the population is extremely dependent on vehicles and road transportation network to move from one place to another. Transportation has been a part of human growth from the start of civilization. According to World health statistics 2019, road traffic injuries are going to be 10th leading cause of death. It also shows that, the critical deaths are due to lack of immediate medical consideration during accidents. Even though the technology has advanced so much, still the accident prevention and detection mechanisms used are implemented decades ago and are all static measures like speed breakers, road signs etc. The survey on road accidents proposes the use of IoT technology in accident detection. Mainly the certain IoT systems were using embedded systems designed using micro controller boards like Arduino released with piezoelectric sensors only. According to the World Health Organization, more than a million people in the world die each year because of transportation-related accidents. In order to react to this situation, the black box system draws the first step to solve this problem that crosses national boundaries and threatens the safety and health of people worldwide. Introduced to a part of the United States market in 1999, the black box system proved to be efficient. However in the latter case, the system was embedded in the vehicle. Therefore, in addition to improving the treatment of crash victims and the road status in order to decrease the death rate, constructing safer vehicles, and helping insurance companies with their vehicle accidents investigations, the main purpose of this Research is to develop a black box with security system that can be installed to any vehicle all over the world. Like flight data recorders in aircraft, "black box" technology can now play a key role in motor vehicle crash and theft

investigations. A significant number of vehicles currently on the roads contain electronic systems that record information in the event of a crash. That is why it is so important to have recorders that objectively track what goes on in vehicles before, during and after a crash as an admiration to the subjective input that is taken usually from victims, eye witnesses and police reports. It also provides the high security to the user. In today's world of comfort and luxury, various high priced costly vehicles are available. Many of these vehicles have been launched with inbuilt security systems. However, even though a huge amount of capital is being invested in areas of vehicle security, the cases of vehicle theft is still rising. So we can design the IoT based vehicle black box with high security system. In single project which can owner easily can install the device in their vehicle with low cost and high data recording and tracking system.

This situation gives rise to explore for further security mechanism to avoid vehicle thefts. We have decided to apply our project in areas of vehicle safety and security to stop the vehicle theft. The Vehicle Tracking System allows the user to monitor their vehicle and their routes and arrival. There exists another problem. Recent advancement in the automobile industry has opted many people to use their own vehicle for traveling. This has increased effect on vehicle ownership. But to park all these cars in the major metro cities is quite annoying and difficult task. After wrong parking, problems like towing occur and hence, there is no solution as of now. Thus, the project also deals with this problem of parking and successive towing. To tackle all the problems specified above, the project has features like, Key less unlocking of door of the car and ignition control through both Keypad as well as the wearing of the seat belt. The project also deals with intruder problems from Window of car and can trace the location of the car after being towed or theft. These features should provide better security to the vehicle.

## 2. Proposed system

Using any existing system, one cannot predict all accidents. Hence at least we must be able to detect accidents as early as possible. Any person or animal that is injured in an accident must be provided with medical treatment right away. Oftentimes, the people that are injured in accidents may not go for immediate medical treatment, either because of

misjudging the injuries or due to the legal procedures involved in accidents. Even a person feels okay; there is no harm in being evaluated for any injuries. The main goal of SVBBSS proposed in this paper is immediately detecting accident, evaluating the driver's condition and informing it to the authorities. The SVBBSS was not a simple system but a framework to immediately detect accidents with severity.

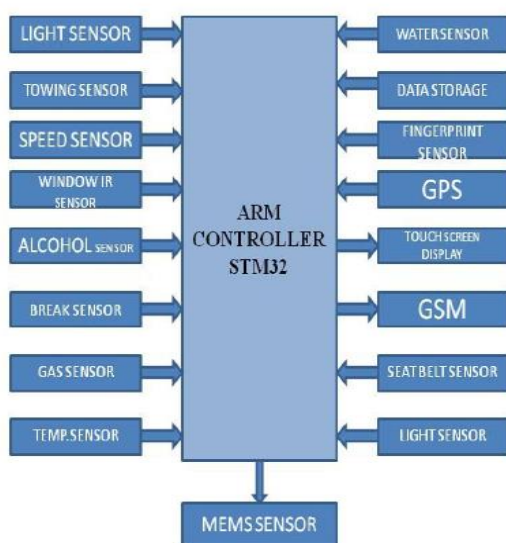
SVBBSS also help the user to remotely shutdown the vehicle during theft. It also allows the user to locate the vehicle position from anywhere in the world. To accommodate all these, the SVBBSS includes ARM Controller accompanied by different sensors, GSM/GPRS module and GPS module.

For ignition to start or for the door to get unlocked, user needs to enter the password through Mobile App, if password is correct then only car door gets open and the user is given only 3 chances to enter the password, if password is wrong all time then we need to press the reset button to reset the system. After that, if the user wears the Seat belt and the password is correct only then the user can operate the ignition or engine of the car. If we park our car near an unauthorized area and if it gets towed, then a limit switch will get pressed automatically. This sends a command to ARM Controller which in turn sends a command to dashboard (dashboard side mobile) through Bluetooth module. The dashboard will then send information to user through SMS with GPS location and the user is alerted with the same with continuous beep sound. If someone is trying to steal valuable things through the window or any obstacle comes in between the window, it is being sensed by an IR sensor then the sensor sends command

To controller and then controller send command to dashboard (dashboard side mobile) through Bluetooth module then dashboard side mobile send information to user through SMS with GPS location and the user is getting closed.

The wireless black box has temperature sensor, smoke sensor, break sensor, fingerprint sensor, alcohol sensor, water sensor, limit switch, seat belt sensor, touch screen displays which are interfaced to the micro controller. Temperature sensor measure amount of temperature exhausted from the vehicle. Smoke sensor will sense the amount of gas emitted from the vehicle. These values are also displayed on LCD. The total equipment of this project is placed inside a vehicle is not visible to others. When an accident occurs with vehicle will be

detected by the MEMS and this information is given to microcontroller. The system use GPS (global positioning system) module to get the location of the vehicle where the accident has occurred. The location values are given to microcontroller. Controller will give this information to GSM module. GSM will send the message to concerned person having information about temperature level, smoke condition and speed of the vehicle and real time of accident. It also has graphical location of the vehicle.



**Block diagram of proposed system**

### 3. CONCLUSIONS

The proposed project “IoT Based Vehicle Black Box with Security System” It takes the security level a step forward and try to cover many of the loopholes which are in existing technology. The IOT based advanced vehicle System is realistic and can control the theft automatically. The response time delay is also less. This IOT based vehicle Black Box with Security system enables user safety by seat belt compulsion, key less locking /unlocking system to operate the vehicle. In addition to the above, it gives security from towing of car and theft through the car window and it also provide the 24\*7 tracking system. This system also helps to recover

the data after the accident and send the message to the register person so the victim gets help in less time as well as helps the police or insurance company to see the data what is happen at the time of accident. The system is ideal for cars, further it can be used for other vehicles too by using these components and modules used in this project.

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