

# AUTOMOTIVE INDUSTRY USING EMBEDDED SYSTEM

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## ABSTRACT

Within few years, all Automobile functions will be 100% under the control of Embedded based. Safety, power transmission and entertainment are just a few of Automobile functions that have transmitted from mechanical to electronic controls.

MEMS – Technologies & MSTs are well suited to automotive sensor applications in accelerometer, pressure, position, humidity and distance measurements in a myriad of arenas ranging from safety vehicle diagnosis and monitoring. Automobile with Electronic components & **EMBEDDED – Control Systems** run much faster than their mechanical, hydraulic and pneumatical counter parts. Embedded – control system can be monitored and their mode of operations can be changed very quickly. Automobile engineers today need to be conversant with

Mechanical / electrical / electronic material science Embedded and related Software's, telecommunication, telemetry techniques. Also there is dire need for constant updating and exposure to remain in Touch with global trends and developments.

## INTRODUCTION

An automatic chauffeur controlled car incorporates a computer equipped with camera input. The user enters the destination in the car PC and the car drives him there. Other commands include change destination, stop at where we require, go slow, go at emergency speed, and so on. Embedded is the main heart of this paper presentation.

Electronic devices, Microcontrollers, sensors, computers, etc., are being incorporated to control the engine and its subsystems. Because of these controls, cars consume fuel, function better and operate cleaner.

MEMS & MSTs are well suited to automotive sensor applications in accelerometer, pressure, position, distance measurements in a myriad of arenas ranging from safety to vehicle diagnosis and monitoring.

## WHY WE GO FOR THIS TECHNOLOGY?

You need not drive the car and, if desired, not even accompany the car. After you are automatically driven to work place, you can send the car. Back home for your family members use. And they will send it back it back to you at the end of the day.

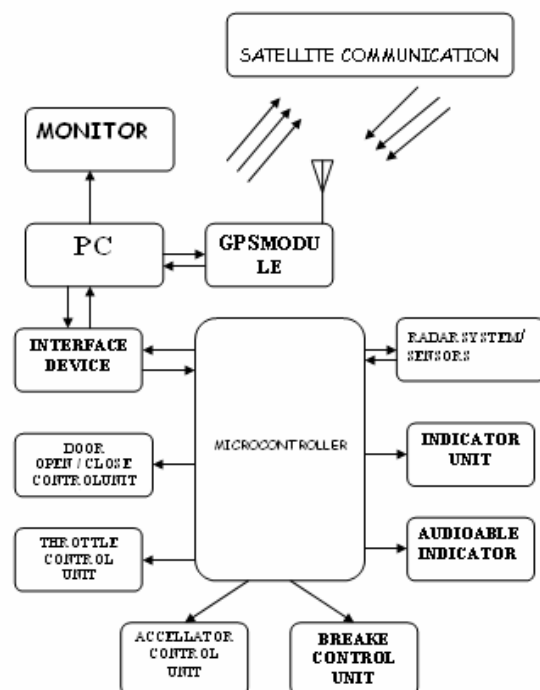
You can send the car for servicing or to a store where the products ordered through telephone will be put in it. To facilitate comfort and safety, while still being environment – friendly. As electronics plays a crucial role

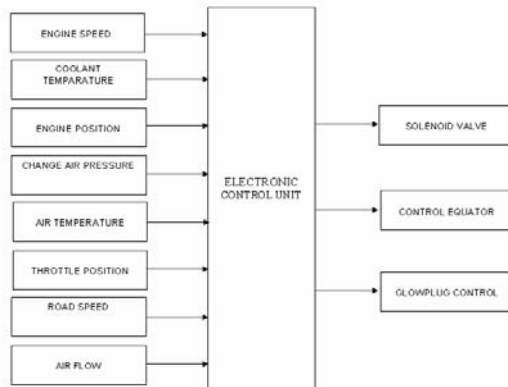
in the operation of automobile systems, an understanding of this key technology is a must for the industry. Apart from mastering the mechanical skills involved in repair of faulty and damaged components, engineers and technicians must be able to diagnose and service related electronic systems.

## IN FUTURE A ROAD TRAFFIC UNDER CONTROL BY SATELLITE



## BLOCK DIAGRAM :



**ELECTRONIC DIESEL CONTROL SYSTEM****THE MAIN PARTS OF THIS FAMILY****ENGINE AND SUBSYSTEMS**

Embedded, sensors, computers, etc are being incorporated to control the engine and its subsystems. Because of these controls, cars consume less fuel, function better, and operate cleaner.

**SHIFTING IN TRANSMISSION**

Electronic systems activate shifting in transmission, eliminate brake lock up in antibracking systems (ABS), control steering and suspension systems and provide comfort and safety.

**ANTIBRACKING SYSTEMS**

- It is control steering and suspension systems, and provide and safety.
- This system presently an option in many automobile will become a standard component for all vehicles.

**VIDEO CAMERAS**

Multiple video cameras are being developed to scan the area all around the vehicle and avoid blind spots. Backed by IR system to facilitate vision during night and bad weather.

**RADAR SYSTEMS**

To maintain the minimum distance between two vehicles, brakes will be automatically applied, with the stipulated distance being monitored by radar systems. Hands free driving will be facilitated through controls embedded in highway systems.

**HEADLIGHT AND BRAKE LIGHT**

- Headlights will have movable reflectors so that the lights follow the curve of the road.
- Brake lights will vary in size and brightness depending on the brake pedal pressure.

**IGNITION SYSTEM**

Ignition generates a spark to ignite the compressed air fuel mixture compressed by the piston. A crank shaft position sensor monitors the motion of the piston and the rotation of the crank shaft. This sensor electronically tracks the position of the cranks shaft and transmits the information to the ignition control module. Based on the input from the crank shaft position sensor, the ignition control module then switches the battery current to the ignition coil precisely at the right time.

**ELECTRONIC CONTROL MODULE**

When an ignition coil is activated by the electronic control module, high voltage is passed through the spark plug circuit. Each spark plug circuit includes two spark plugs that fire at the same time. The ECM control the timing and distribution of the coils spark producing voltage.

**ELECTRONIC ENGINE CONTROL**

It is controls use input sensors, a computer or microprocessor / microcontroller and the output devices.

and plotting out the best way for reaching the destination.

## IMPLEMENTATIONS

### EMBEDDED IN FUNCTION OF ENGINE SYSTEMS

The microcontroller analysis data from the input sensors. Based on this input and instructions stored in the memory, the output device and directed to make the requisite changes in the operation of engine systems.

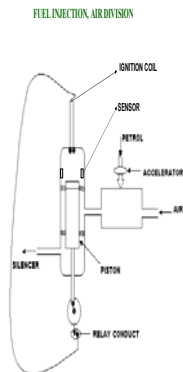
### WHY USING ELECTRONIC MODULE INSTEAD OF MECHANICAL MODULE?

- ECM has fewer moving parts compared to mechanical model enabling the engine and other support systems to maintain their calibration. ECM is very flexible.

### FUEL INJECTION DIVISION

It involves injecting of spraying fuels into the engines intake parts.

The electronic fuel injection system incorporates fuel delivery systems, air induction systems, controlling microcontroller, ideal speed control mechanisms.



- Since incorporates microprocessors.
- It can be programmed to meet a variety of vehicle engine combinations of calibrations.
- Critical parameters determine an engines performance can be easily changed by modifying the data that is stored in the memory.

### EMBEDDED IN FUNCTION OF ELECTRONIC FUEL INJECTION

- EFI system injects fuel during part of the engines combustion cycle. Engine fuel needs are measured by intake air flow across a sensor.
- The microcontroller process this measured data and according to the fuel needs transmits a signal to the fuel injections.

### POWER TRAIN CONTROL MODULE (PCM)

- The heart of the fuel injection system is the power train control module.
- The PCM receives signals from all the system sensors processes them and transmits programmed pulses to the fuel injections.
- Incoming and outgoing signals are sent through a wiring harness and a multiple pin connector.

### DEVELOPMENTS – RECENTLY ACHIEVED:

Automotive based Electronics Company recently development achieved successfully in particular products.

### THE MAIN HEART OF DRIVERLESS-AUTOMOBILE-EMBEDDED

The main heart of the Driverless – given below

- ANTI BRAKING SYSTEM.
- 32-BIT MICRO CONTROLLER

### ANTI BRAKING SYSTEM

It is control steering and suspension systems and provide comfort and safety. It is uses radar to save the path ahead of the vehicle.

### 32-BIT MICROCONTROLLER [IMPLEMENTATION]

- ✓ *Motorola* has developed 32-bit power pc that can manage all engine and transmission control function in automobiles. This single chip reduces system costs simplifies control electronics and reduces exhaust emission.

### CONCLUSION

The future use of electronics in automobile is limited only by the creativity of designers. This creativity will shape the vehicles of the future. Automobiles with electronic components and systems run much faster than their mechanical, hydraulic and pneumatically counter parts. Embedded controller system can be monitored and their mode of operations can be changed very quickly. Since Electronic components do not wear out easily, they last longer and do not require periodic adjustment