



# AUTOMATIC VEHICLE SMOKE ANALYSER

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## ABSTRACT

Modern surveillance environments require optimal performance, which is ensured and delivered in large part by the technologies that support fire and smoke detection devices. In actuality, fire may seriously harm both people and property. We were inspired to use the accessibility of these systems to create affordable vision detection techniques because most cities have already deployed camera-monitoring systems. However, considering deformations, odd camera angles and views, this is a challenging vision identification assignment. This project was created to allow users to save smoke and other vehicle status information in a Blackbox. A smoke sensor and microcontroller unit make up the majority of it. The vehicle's silencer and smoke sensor are connected. It determines the quantity of smoke present and signals the microcontroller accordingly. Additionally, the goal of our project is to eliminate smoke, create an environment free of smoke emissions, and implement a low-cost strategy.

## INTRODUCTION

Human health and wellbeing are profoundly and widely impacted by air pollution. Numerous cardiovascular, pulmonary, and neurological conditions as well as approximately 4 million fatalities annually from outdoor pollutants and 2.3 million deaths from pollution in the home have all been linked to poor air quality. 2–6. Additionally, it affects productivity, makes inequality worse, and impairs cognitive function. A growing body of evidence also shows how air pollution exposure and effects are unevenly distributed, with the burden falling disproportionately on communities of color

and those with lower incomes strong evidence suggests that human activity is the primary cause of air pollution. There are two ways to prevent it: The driver needs to set up the sensor and be able to check the level of emissions in their cars on their own; and a thorough information report is going to be sent to the motor vehicle department in the affected areas, and they ought to halt the cars automatically while also protecting people's safety. Both methods can be used in real time, but the second one can be chosen because department authorities will always keep a complete record and can take the necessary steps at the appropriate moments.

Although air pollution affects everyone, the harsh reality is that we, the human race, are the primary cause of this widespread issue. Diesel-powered cars are commonly used. Due of this, there are a lot of chemicals in the environment that are extremely dangerous to everyone. According to doctors, air pollution is constantly rising and is a problem for many people nowadays. Because of this, many people continue to experience a wide range of ailments, with asthma, chronic pulmonary disease, lung cancer, and cardiovascular disease being the most common. Air pollution makes people sicker, especially children. They might come into contact with the impacts of car smoke. They directly breathe in the toxins as they cross the street, which can have an immediate negative impact on their physiological systems. They will soon begin coughing, getting colds, or worse, having breathing problems.

development and maintenance costs and deliver the system within the anticipated timeframe.



## HARDWARE REQUIREMENT

### ARDUINO UNO AT MEGA 328P



- It can handle a supply of 3-12Volt DC and source up to 20mA per channel. This Comes in an 8-pin DIP package.
- The Mega 2560 is a great, easy-to-use programmable Arduino.

## FEATURES

- Write/Erase Cycles: 10,000 Flash
- Low Supply-Current Drain, Independent of Supply Voltage: 0.7 mA Typical
- Real-time Counter with Separate Oscillator
- Easier to use, with 8-bit microcontroller being less complex than 32/64-bit versions.

## PROBLEM STATEMENT

Black smoke from bike and car exhaust is caused by incomplete fuel combustion due to excess fuel reaching the combustion chamber. Black smoke from car exhaust is mostly due to an imbalance in the air-fuel-ratio (AFR). This is either due to excess air or excess fuel. Over-feeding or a rich AFR could happen due to a clogged air filter. Another reason for black smoke from exhaust of car is a fuel injector leak due to a worn-out nozzle. Other two less common reasons include a damaged sensor or a faulty fuel-pressure regulator. This is not an immediate danger to the engine but it will certainly reduce the longevity of the motor if not addressed.

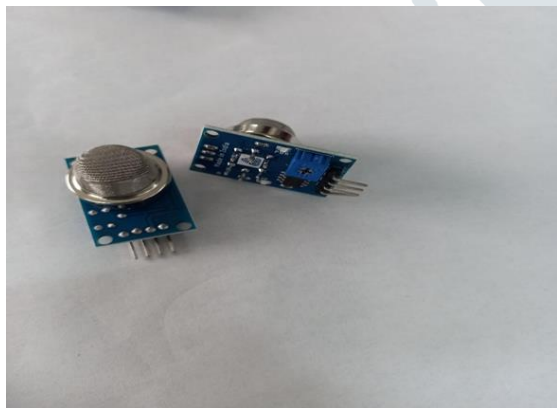
## SCHEMATIC DIAGRAM

The goal of project planning is to offer a framework that allows an owner to estimate resources, costs, and schedules in a fair manner. The project manager is in charge of accurately developing the system in accordance with the owner's or client's requirements. Since the expense of maintenance is typically significantly larger than the cost of establishing the system, he is additionally responsible for maintaining the system for a specific amount of time. Therefore, careful system design is required to lower

•Six Sleep Modes: Idle, ADC Noise Reduction, Power-save, Power-down, Standby, and Extended Standbys

## MQ125 SENSOR

A device that is used to detect or measure or monitor the gases like ammonia, benzene, Sulphur, carbon dioxide, smoke, and other harmful gases are called as an air quality gas sensor. The MQ135 air quality sensor, which belongs to the series of MQ gas sensors, is widely used to detect harmful gases, and smoke in the fresh air. This article gives a brief description of how to measure and detect gases by using an MQ135 air quality sensor. An MQ135 air quality sensor is one type of MQ gas sensor used to detect, measure, and monitor a wide range of gases present in air like ammonia, alcohol, benzene, smoke, carbon dioxide, etc. It operates at a 5V supply with 150mA consumption. Preheating of 20 seconds is required before the operation, to obtain the accurate output. It is a semiconductor air quality check sensor suitable for monitoring applications of air quality. It is highly sensitive to NH<sub>3</sub>, NO<sub>x</sub>, CO<sub>2</sub>, benzene, smoke, and other dangerous gases in the atmosphere. It is available at a low cost for harmful gas detection and monitoring applications.



## WORKING

This project consists of the external sensor unit and the built-in processing unit are the two components of this project. The external sensor unit satisfies the fundamental need of detecting resistance and

providing input to the IC while sensing the moisture content of the soil or sand by capacitive reactance.

The Arduino is positioned inside the frame and receives signals from the MQ 125 sensor when it recognizes smoke. The sensor detects the signals it has received.

When the Arduino is turned on, the valve opens and water through the pipes rushes to the plant. When the water content in the soil increases, the soil resistance gets decreases and the transmission of the probes gets starts to make the amplifier stop the triggering of the Arduino. Finally, the valve which is connected to the sensor stopped.

The comparator monitors the sensors and when sensors sense the dry condition then the project will switch on the motor and it will switch off the motor when the sensors are in wet. The comparator does the above job it receives the signals from the sensors.

This project works with 5V regulated power supply for the internal blocks and uses regulated 12V power supply for the relay board. Power on LED is connected for visual identification of power status.

First, the sensor probes are inserted in the soil at specific locations in the field, at a depth of 5cm from the soil surface at regular intervals in the field. The wiring is made with protective covering so that it is not harmed by any unexpected factors like rocks in the field.

Since wet soil is more conductive than dry soil, the soil moisture sensor module has a comparator in it. The voltage from the prongs and the predefined voltage are compared and the output of the comparator is high only when the soil condition is dry.

When the moisture in the soil is above the threshold, the relay will be turned on. The relay coil gets energized and turns on the motor. The LED is also turned on as an indicator. The soil begins to get supplied with water, and the water content of the soil increases.

When the moisture content of the soil increases and reaches the threshold value, the output of the soil moisture sensor is low and the motor is turned off. This prevents a case of over-watering.

## ADVANTAGES

- The main advantage of this project is that it has faster execution when compared to manual execution of the process. It is simple, portable and provides high performance.
- It consumes less power
- Dryness can be easily detected in soil.
- Permits a non- expert to do the work of an expert.
- Improves productivity by increasing work output and improving efficiency.
- Saves time in accomplishing specific objective.

## FUTURE ENHANCEMENT

The application is undoubtedly far superior to the manual technique in terms of benefits. There won't be any bias in the areas covered, and the delay is maintained to a minimum.

•Due to the operator's user-friendliness, no prior training is necessary.

•There are no technical problems with the operator. The circuit is straightforward to create and maintain due to its extremely simple design.

•If the method of operation changes in the future, adjustments to the system can be made quickly. It may be changed in the future in accordance with user needs to meet those needs.

•Next-generation irrigation controllers, known as smart WIFI controllers, automatically adapt your irrigation system based on current weather conditions. You can manage it at any time and from any location.

## CONCLUSION

In conclusion, the development and successful testing of the "AUTOMATIC WATER PLANTING SYSTEM" mark a significant achievement in the realm of automated plant care. By skillfully merging diverse hardware features, the creators have crafted

a sophisticated and efficient device that prioritizes the well-being of plants through automated watering.

The careful consideration given to the placement and integration of each module underscores the commitment to optimizing the system's functionality. This thoughtful approach not only ensures the seamless operation of the device but also enhances its overall performance, promising a reliable and effective solution for plant maintenance.

The assertion that the system operates automatically and to the maximum of its capabilities suggests a high degree of autonomy and efficiency. This means that once implemented, the system can independently manage the watering needs of plants, providing a level of convenience and precision that traditional methods may lack.

The integration of moisture sensors stands out as a pivotal feature, allowing the system to adapt to the unique moisture requirements of different plants. This responsiveness ensures that each plant receives the appropriate amount of water, promoting optimal growth and health. The emphasis on automated moisture monitoring positions the system as a smart and environmentally conscious solution, as it minimizes water wastage by delivering hydration precisely when and where it is needed.

In essence, the successful construction and testing of the "AUTOMATIC WATER PLANTING SYSTEM" represent a commendable advancement in the intersection of technology and agriculture. The system's capabilities not only alleviate the burden of manual watering but also pave the way for sustainable and efficient plant care practices in various settings, from homes to agricultural fields.

## LIMITATIONS

1. Two distinct power sources are need for the system. Large fields can use industrial supply to power the motor during implementation. This could appear to be a significant waste in tiny gardens.
2. For very large irrigation regions, a lot of sensing equipment is required.

3. The method is not entirely trustworthy. Errors and loss may occasionally result from unexpected sources. Despite being excellent, it requires regular inspection and upkeep once every few weeks.

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