



# 360° fire brigade with CCTV camera robot car

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**Abstract :** Fire monitors and sprayers are an amiable and controllable high-capacity water jet used to deal with large fires. Unlike Fire extinguishers, Fire Monitors are permanently installed and cannot be moved. While traditional fire monitors systems need a human operator to change the direction of the water jet and aim it appropriately, this fire monitor has been equipped with RF control. Thereby allowing the user to operate it from a safe distance. The system makes use of a Motor coupled with a powerful sprayer motor with piping system and onboard wireless fire sensing sensor to run this system. Another motor are used to control the nozzle direction movement

**Keywords –**Metal gear motor, Relay, Node MCU, RF module, LED, PCB

## 1. Introduction-

A fire extinguisher is a device used to extinguish fire. In today's age even different chemicals mixed together can cause fire. Electron objects can also cause fire. It can damage very expensive items. Finances and human losses and economic losses. Such damage should not occur.

This Paper highlights that such work can be done immediately in less space, less time and more importantly in the most difficult places where no one can go. Such robot can go there. And that is the result. Can read it. Even loss of life cannot be caused by this. Goes to the trouble spot and extinguishes the fire. This robot car also requires less electricity.



Fig No: 01 animated model of project

This fire brigade three was rotated sixty degrees. We have made a mobile application to control this fire extinguisher. Based on this we control this fire brigade. First of all you have a switch in this project. It has to be switched on. After that you have to connect the mobile application to it. For this we have used Wi-Fi. We connect this project through Wi-Fi. This project has four switches to control Left, Right, Back, End, Front.

Hence it has a switch to control the speed of this car. It then has two switches. It is used to turn on and off the motor pump, that is, to turn on and off the water fire extinguisher. We have used four wheels in the model. We have used a metal gear motor to rotate those wheels. This allows us to carry a lot of burdens. In this we have used high pressure 12 volt motor. Through this we can shoot water up to 10 to 15 feet long with pressure. In this, electric hydraulics is made at this place to target the fire and bring it down. With this you can pipe water up, down. It is RF remote controlled. It is provided with 5v power supply.

## 2. Objectives

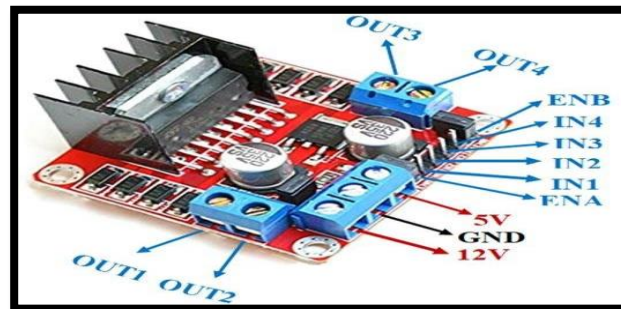
The "360° fire brigade with CCTV camera robot car" is being suggested with the following goals

1. Develop robotic Fire extinguishers that can be operate without human involvement
2. Develop most compatible Fire extinguishers working at any difficult area

## 3. Basic Parts

### 1. L298N Motor Driver Module

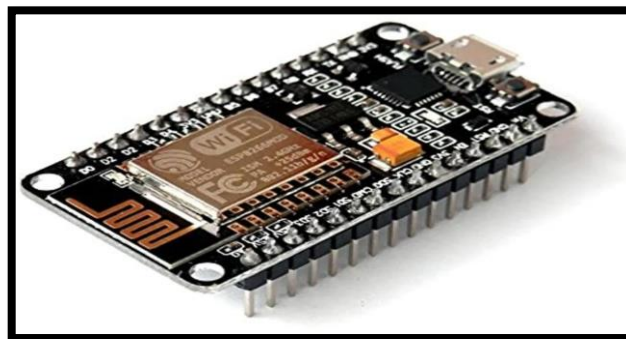
Fig No :02 Circuit Diagram L298N



This **L298N Motor Driver Module** is a high power motor driver module for driving DC and Stepper Motors. This module consists of an L298 motor driver IC and a 78M05 5V regulator. **L298N Module** can control up to 4 DC motors, or 2 DC motors with directional and speed control.

### 2. NODEMCU

Fig No :03 Circuit Diagram NODE MCU



NodeMCU is a low-cost open source IoT platform.[4][5] It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espresso Systems, and hardware which was based on the ESP-12 module. [6][7] Later, support for the ESP32 32-bit MCU was added.

### 3. RELAY 5v

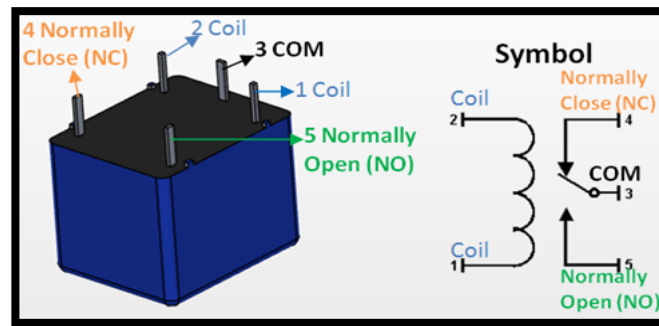


FIG No: 04 CIRCUIT DIAGRAM RELAY 5v

The above circuit shows a bare-minimum concept for a relay to operate. Since the relay has 5V trigger voltage we have used a +5V DC supply to one end of the coil and the other end to ground through a switch. This switch can be anything from a small transistor to a microcontroller or a microprocessor which can perform switching operating. You can also notice a diode connected across the coil of the relay, this diode is called the Fly back Diode. The purpose of the diode is to protect the switch from high voltage spike that can be produced by the relay coil. As shown one end of the load can be connected to the Common pin and the other end is either connected to NO or NC. If connected to NO the load remains disconnected before trigger and if connected to NC the load remains connected before trigger.

### 4. RF TRANSMITTER AND RECEIVER

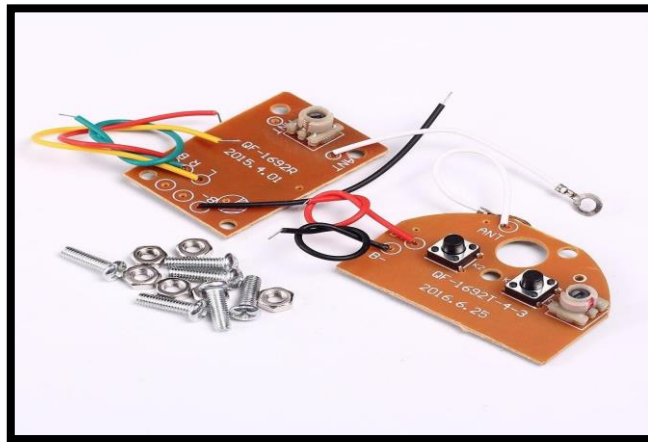


Fig No: 04 Rf transmitter and receiver

The RF transmitter receives serial data and transmits it wirelessly through its RF antenna. The transmission occurs at the rate of 1 Kbps – 10 Kbps. RF receivers receive the transmitted data and it is operating at the same frequency as that of the transmitter.

## 5. REGISTER

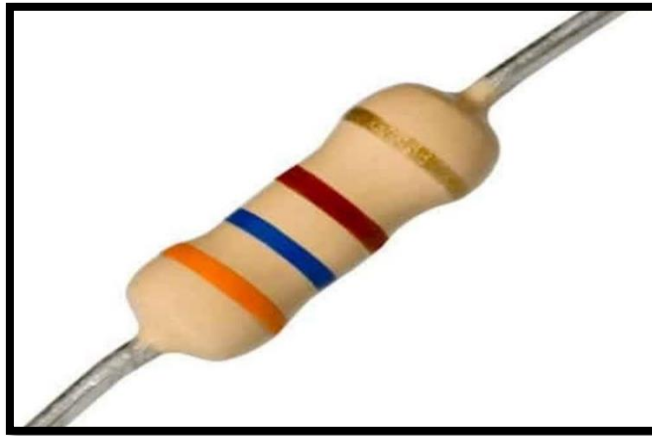


Fig No: 05 Register

Resistor is a passive component used to control current in a circuit. Its resistance is given by the ratio of voltage applied across its terminals to the current passing through it. Thus a particular value of resistor, for fixed voltage, limits the current through it. They are omnipresent in electronic circuits.

## 6. 12 Volt water pump

12 Volt water pump is a dc electric water pump motor that is powered by a 12V direct current power supply. It uses centrifugal force that is generated by a high-speed rotating impeller to boost, transfer, lift or circulate liquids like water, oil, coolant for sprayers, cars, fountains, showers, gardens etc.

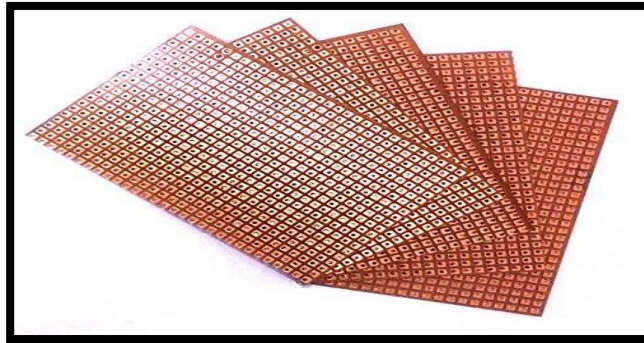


Fig No: 06 Water Pump

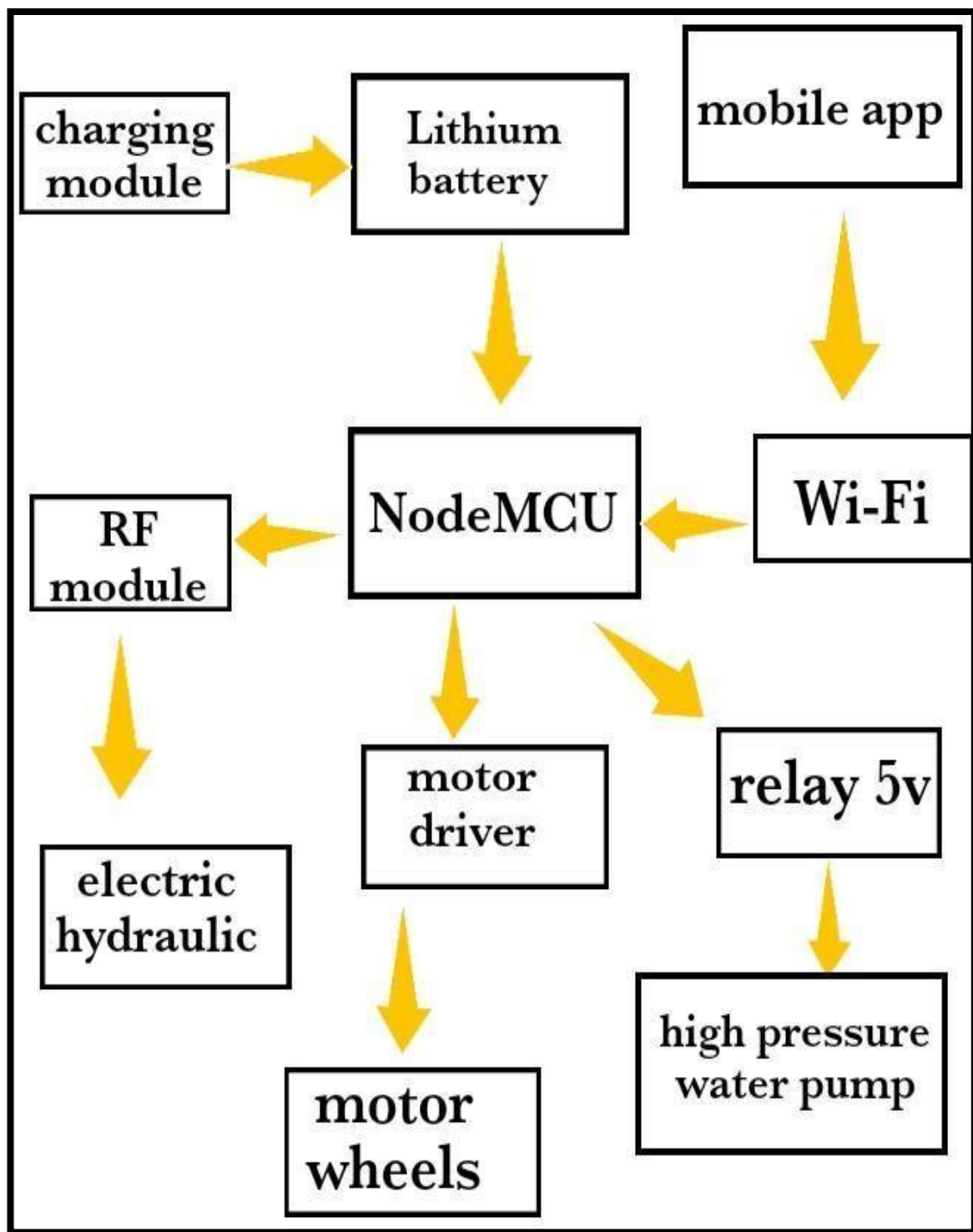
## 7. Perfboard

Perfboard is a material for prototyping electronic circuits (also called DOT PCB). It is a thin, rigid sheet with holes pre-drilled at standard intervals across a grid, usually a square grid of 0.1 inches (2.54 mm) spacing. These holes are ringed by round or square copper pads, though bare boards are also available. Inexpensive perfboard may have pads on only one side of the board, while better quality perfboard can have pads on both sides (plate-through holes). Since each pad is electrically isolated,

Fig No: 07 PCB board



## 4. Methodology



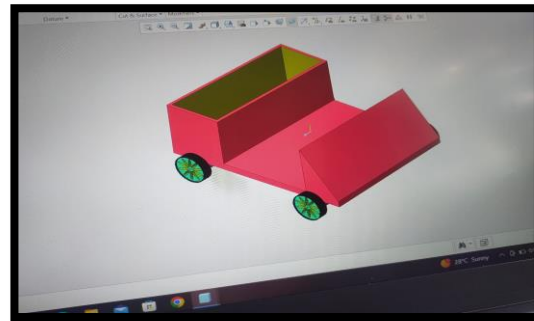
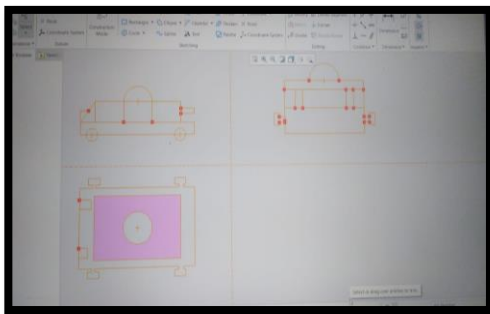


## 5. WORKING PRINCIPLE

Fire monitors and sprayers are an amiable and controllable high-capacity waterjet used to deal with large fires. Unlike Fire extinguishers, Fire Monitors are permanently installed and cannot be moved. While traditional fire monitors systems need a human operator to change the direction of the water jet and aim it appropriately, this fire monitor has been equipped with RF control. Thereby allowing the user to operate it from a safe distance. The system makes use of a Motor coupled with a powerful sprayer motor with piping system and onboard wireless fire sensing sensor to run this system. Another motor are used to control the nozzle direction movement.

## 6. Development of model

### 1. 2D & 3D Modeling using Creao



### 2. Fabrication and assembly



## 7. CONCLUSION

Fire has always been a devastating phenomenon but the technology advancements it becomes easier to tackle it. Firefighters try their best to respond quickly to case of fire and event put their lives at risk of they Endeavour to save human life and protect property from the fires. Some attempts have been made to automatic fire fighting for the navy (ship board autonomous firefighting robot). This describes one such solution to the problem of fire fighting with help of 360 degree fire protection system. In conclusion there are many possible ways to put out fires but it always safer to use the constantly this idea to reduce the involvement of fire fighters thereby decreasing the risk of physical injuries and life threats. Comparing this prototype with the existing technology we implement the sensor and wireless technology. Nowadays the firefighting technologies are fully manual. In scope of future we implement

wireless technology to control the fires. The robot can operate in the environment which is out of human reach in very short time; the delay employed is very minimal. The robot accurately and efficiently finds the fire and

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