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IOT Based Fire Control System for Four Wheeler

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ABSTRACT: The purposed of IOT based fire control system in four wheelers is to detect fire at an early stage then nodemcu trigger the relay to extinguished the fire and at the same time system generates an alarm and sends SMS alerts to registered mobile number stored inside the nodemcu program simultaneously a water sprayer producing device is switched on for the control of fire. At the end the objective of this project were achieved and the system worked effiectively.

KEYWORDS : Flame Sensor , Smoke Sensor , Nodemcu (Wi-Fi Module) , Buzzer , Dc pump moter, Relay.

I. INTRODUCTION

The development effort for the automatic fire control system is increasing rapidly. Fire and smoke are among the major reasons of the accidental casualties. The fire break-out can also occur in absence of owner. Now a day automatic fire detection and control is becoming very essential to detect and control the fire in the four wheeler .The fire control system is needed to be developed with low maintenance along with safer and easier. Fire control system is based on IOT. Fire is very dangerous situation and it's very much necessary to monitor and give warning before anything unwanted happen. So there is urgent need toward developing an automatic fire control system. This type of system installation and investment and have its own limitation.
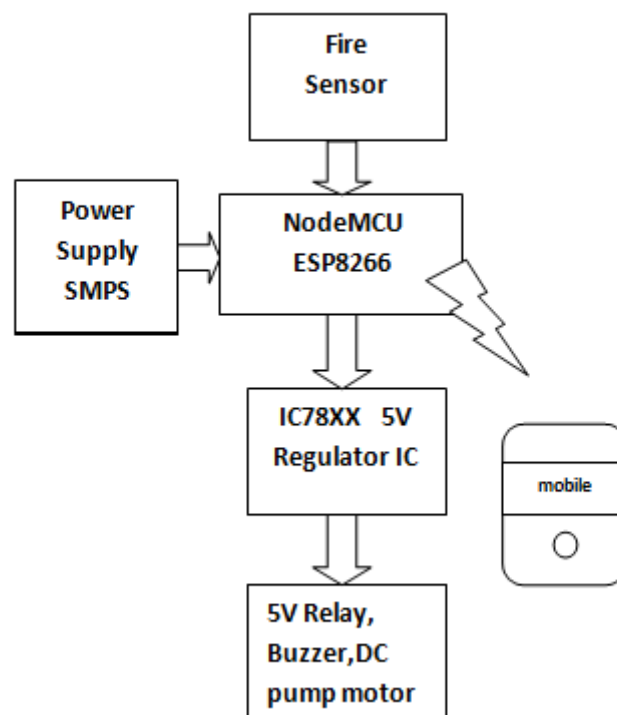

Fig 1.1 Block Diagram

II. METHODOLOGY

The proposed IOT based fire control system involved two sensor fire detection sensor the gas/smoke detection sensor, a microcontroller and a fire ratardand system. Fire sensor is used for detecting the temperature or heat from the fire . Smoke sensor can sense smoke, butane and LPG gas. Nodemcu8266 is used as the microcontroller. Water sprayer is used to control fire. The current prototype has water sprayer linked with the microcontroller which triggered based on the signal. This fire prevention system can minimize the possible damage in the four wheeler. When the system detect the temperature of the threshold value. Nodemcu trigger the relay to extinguished the fire and send the alert message to the owner for future action, via short message service (SMS) simultaneously water sprayer start sprinkling the water on a fire.

For accessing web page we will introduce a security feature of login id and password so any unknown random person can't access the webpage thus making it fully secure.IOT must be self- contained for search operation, decision making based on the realtime data or current condition for the immediate surrounding environment or condition is to perform the task or mission. IoT systems combine physical and digital components that collect data from physical devices and deliver actionable, operational insights.

III. SYSTEM DESIGN

Fire control system can be divided into following module.

NodeMCU – NodeMCU is an open source development board and firmware based in the widely used ESP8266 12E WiFi module. With just a few line of code you can established a WiFi connection and define input/output pins according to your needs exactly like arduino. It has GPIO, SPI, I2C, ADC, PWM and UART pins for communication and controlling other peripherals attached to it. On board NodeMCU has CP2102 IC which provides USB to TTL functionality In this project, we are using two GPIO pin to get the digital data from the fire sensor and smoke sensor.
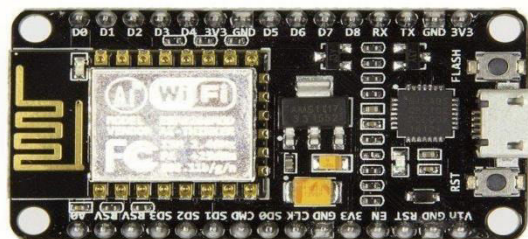

Fig 3.1 NodeMCU

Flame Sensor – A flame sensor is a device that can be used to detect presence of a fire source or any other bright light sources of the wavelength in the range of 760mm-1100mm. When the sensor detects flame the signal LED will light up and the d0 pins goes low. The module uses a LM393 comparator chip to provide a stable digital output signal. This comparator has a driving ability of 15mA. This flame sensor can be used in different project including fire alarms, fire detecting devices and fire control system projects.

Fig 3.2 Flame Sensor

Smoke Senser – In this project we are using a MQ2 smoke senser to detect smoke. This sensor can be used to Measure or detect LPG , Alcohol , Propane , Hydrogen and even methane. It preheat duration is 20 sec. It can be used as a digital or analog sensor. The sensitivity of digital pin can be varied using the potentionmeter. We are using a MQ2 gas sensor module in this project for better interface.
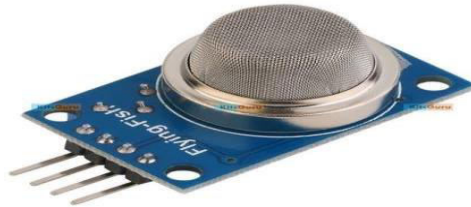

Fig 3.3 Smoke Sensor

Buzzer – A buzzer is an audio signaling device which may be mechanical electro or piezoelectric. Typical uses of buzzer include alarm device , timers and conformation of user input such has mouse click or key stroke. The vibration of metal plate cause the sound. The buzzer in this circuit is used when microcontroller provides high signal, i.e. when a temperature is greater than or equal to 40 degree Celsius, the circuit will be completed and the buzzer will start alarming.

Fig 3.4 Buzzer

DC Pump Moter – The pump moter is used to generate water from a tank and sprinkle it to the affected area caught on fire. This is done so when a high signal is sent to the pin the motor is connected. The moter is powered through a 12-volt relay.

Fig 3.5 DC pump motor

Relay – A relay is a form of electrical switch that is operated by electromagnetic which changes over the switching when current is applied to the coil. These relays may be operated by switch circuits where the switch cannot take the high current of the electrical relay, or they may be operated by electronic circuits, etc. In either circumstance they provide a very simple and attractive proposition for electrical switching.

IV. RESULT

In this paper the prototype module is built by using different component nodeMCU, flame sensor, smoke sensor, water pump. The amount of temperature and humidity is sensed by the sensor and control action is taken automatically to turn off the fire generated.

V. CONCLUSION

The devolopment prototype in this work is made for a user to control the fire.The use of this prototype will avoid the unpredictable situation or any critical situation are occuring in the four wheeler. This help the user if he/she is not present or present in vehical. The Prototype system can help users to improve their safety standard with immediate response by preventing accident.

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