FIRE FIGHTING ROBOT USING MICROCONTROLLER 89S52

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Abstract : Within the recent years, robotics has to be an ingredient over that many folks had shown their interest. Robotics has gained quality because of the advancement of the many technologies of computing and nanotechnologies. So, we proposed to design something that can make humans life easier and comfortable. Comprises of machine that not only has the essential options of a robot, but also has the ability to detect fire and extinguish it. The FIRE FIGHTING robot will move in all 360 degree directions. Thus we will operate a robot over a really long distance and there's no need for human to travel even close to the area aflame. It consists of Infrared based fire sensors installed in all the four directions, with two sensors in the forward direction with long, and short range. The 89S52 microcontroller acts as a main control block of the proposed system. Motor driver L293D acts as a push-pull amplifier which gets the logic from the microcontroller which in turn supplies the power to the motors, and pumps.

IndexTerms - Fire detecting, fire extinguishing, search and rescue, security, GSM, IR sensor

I. INTRODUCTION

The firefighting robot designed by us is an amateur attempt at creating a moving machine, aid us in fighting the emergency of.When fire happens in building,factories or any closed areas, fighting it's quite risky for us as one might get trapped in such closed areas In such cases, a robot, as designed by us, can be very efficiently use to extinguish fire, with least risky human intervention. The FIRE FIGHTING robot made under this project will move in all directions.Thus, we will operate a robot over a really long distance and there's no want for human to travel even close to the area on fire. The light dependent resistors are used for detection of fire. It is the sensitive device and is capable for detecting very small fires too. A water tank is installed on the robot so that it sprinkles water to extinguish water. Thus, this robot can move around the place of fire, view the conditions around and give us the exact situation at the place on fire. It extinguishes fire by sprinkling water or other extinguishing agent. Thus, fighting robot provides a secure means to fight fire without any risk to human life. Robot is defined as a mechanical style that's capable of performing human tasks or behaving in a very human-like manner. Building a robot requires expertise and complex programming. It's regarding building systems and manufacturing motors, flame sensors and wires, among other important components. A fire fighter robot is one that has a small device added to that. By attaching a small device to the robot, the automation put out the fire by human controlling. The design and construction of a robot that is able to sense and extinguish fire is all cover under this paper. This robot implements the subsequent concepts: environmental sensing, proportional motor control.This robot processes information from its varied sensors, and key hardware components via Microcontroller. It is an inevitable part of being a fire fighter where they have risk their life while extinguishing fires and rescuing victims. In addition, a robot can function by itself or be controlled from a distance without having to risk the lives of firefighters and making the activities of rescuing easy with the use of robot technology instead. In different words, robots decrease the need for fire fighters to get into dangerous situations. This robot provides fire protection once there's a fire in a tunnel or in an industry by using automatic management of robot by the use ofa Microcontroller in order to reduce loss of lives and property damage.

II. LITERATURE SURVEY

A Firefighting robot becomes a necessary topic this robot uses automatic technologies to notice fireplace and extinguish it paper[1]describes the technology development in artificial intelligence will be known from its kind, shape and application. Robot will be used for top risk task like fireplace fighting. Firefighting robot ought to be ready to search sure space, to detect and extinguish the flame. To complete this task, robot must be equipped with IR diode, photo diode, flames sensor. The firefighting robot is controlled by Microcontroller. The technology used in [2] is GSM Modem. It describes if the temperature increases beyond the predetermined threshold value, the sound of the buzzer is to intimate the occurrence of fire accidents, and a warning message will be sent to the respective personnel in the industry, and to nearby fire station with the GSM module provided it. The Firefighting robot monitors the temperature continuously at all four sensors and if fireplace accident is true, the robot moves to the directions to which the temperature is recorded tone the relatively maximum among the four sensors and extinguishes the fire with the water pump provided to it. After extinction the fireplace it comes back to its initial position. It is a lot (advantageous) than the smoke detector because it will extinguish the fireplace at the beginning than watching for associate degree object to burn and manufacture smoke.

III. BLOCK DIAGRAM

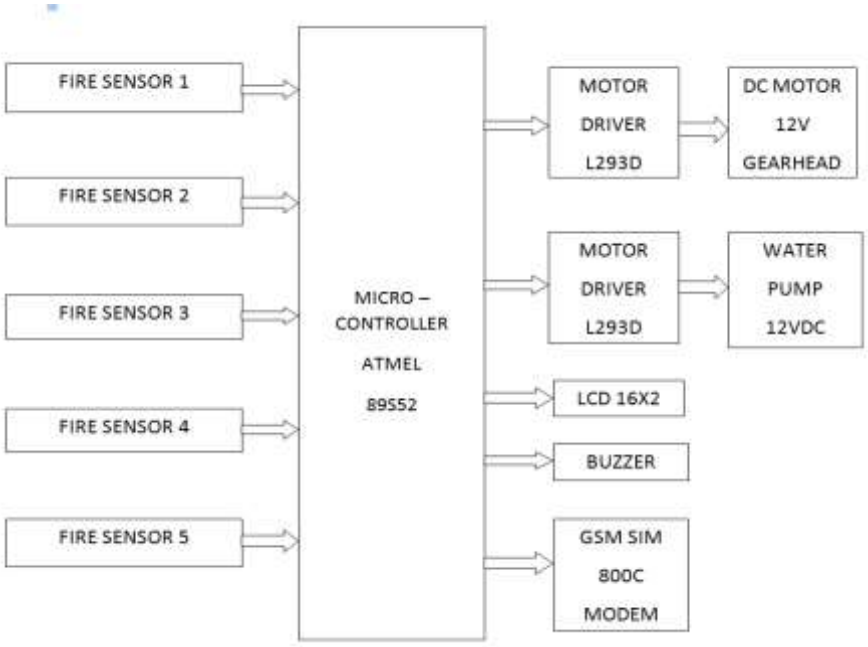

Fig.1. Fire Fighting Robot

IV. HARDWARE

A. ATMEL 89S52

The AT89S52 is a microcontroller compatible with the large Intel MCS-51 family. This microcontroller has low power consumption, but the 8-bit CMOS gives it high performance, with an internal Flash memory of 8K Bytes. It is made using Atmel's high-density non-volatile memory technology and is compatible with 80C51 standard. Refer to [9].

FEATURES

- Compatibility with MCS 51 family.
- 8-bit CPU at a frequency of up to 33 MHz.
- RAM: 256 Bytes.
- Flash memory: 8K Bytes.
- 32 lines of programming for general input / output.
- 8 interrupt sources organized on 2 levels of priorities
- 3 timers / counters of 16 bits each
- Watchdog Timer.
- Two data pointers.
- 1 serial port (full duplex UART).
- 8K Bytes ISP programming interface.
- Accepts up to 10,000 registrations.
- Contains oscillator.

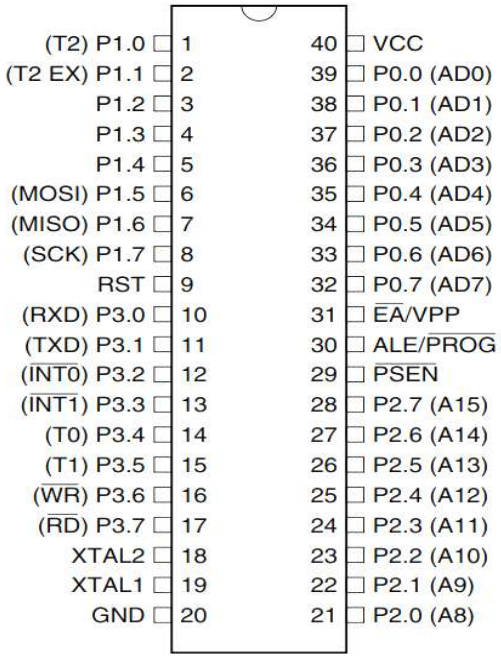

Fig.2. IC 89S52

B. IR SENSOR

An IR sensing element can feel the heat of an object as well as detects the motion. These sort of sensors measure only infrared emission, rather than emitting it that is called as a passive IR sensor. Usually within the spectrum, all the objects radiate some form of thermal radiations. The radiation coming from these are invisible to our eyes which can only be detected by an infrared sensor.The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply associate IR photo diode that is sensitive to IR light of constant wavelength as that is emitted by the IR light-emitting diode. When IR light-weight falls on the photodiodes, The resistances, and these output voltages, change in proportion to the magnitude of the IR light received. Refer to [16] .

C. MOTOR DRIVER

Motor Driver L293D is a typical Motor Driver IC that allows DC motor to drive on either direction. L293D could be a 16-pin IC which can control a group of 2 DC motors simultaneously in any direction. It means you'll be able to management 2 DC motor with one L293D IC.

Fig.3. Motor Driver L293D

D. GSM

GSM 800CSIM800C GSM/GPRS RS232 MODEM (DB9), the latest addition to rhydo Lab GSM/GPRS modem, helps to add wireless connectivity to your project using RS232 UART interface. It is works on frequencies 850/ 900/ 1800/ 1900 MHz which is built on the Quad Band GSM/GPRS engine – SIM800C. You can connect the modem directly to PC as well Microcontroller with RS232 Chip(MAX232). Through AT command the information measure is configurable from 9600-115200. The GSM/GPRS electronic equipment has internal TCP/IP stack to change you to attach with web via GPRS. Refer to [22] and [23].

Fig.4. GSM SIM 800C

E. LCD

Because of its cheap price, availability and programmer friendly nature makes LCD 16X2 modules the most commonly used in embedded projects. Most people would have come across these displays in our day to day life, either at calculators. 16×2 alphanumeric display is called thus because; it's sixteen Columns, and a pair of Rows. There are a lot of mixtures on the market like, 8×1, 8×2, 10×2, 16×1, etc. But the foremost used one is that the 16×2 alphanumeric display. So, it'll have (16×2=32) thirty-two characters in total and every character are product of 5×8 component Dots.

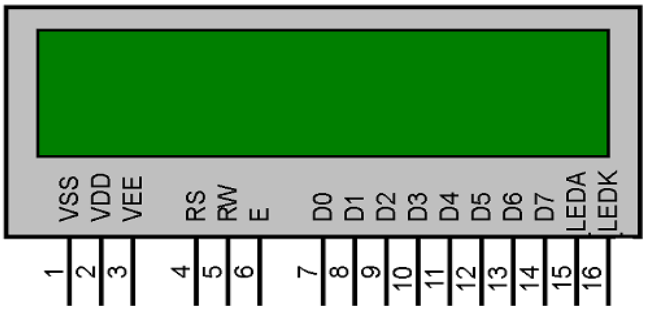

Fig.5. LCD 16X2

F. BUZZER

Buzzer or electronic device usually utilized in vehicles, house appliances like a microwave, or game shows. It most typically consists of a number of switches or sensorsconnected to an impact unit that determines if and that button was pushed or a predetermined time has lapsed, and typically illuminates a light-weight on the appropriate button or panel, and sounds a warning within the style of endless or intermittent abuzz or beeping sound.

Fig.6. Buzzer

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