RF Controlled Robot Using Advanced Sensors

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Abstract— *The wireless communication technology are rapidly spreading in too many new areas, including the automation and the importance of the use of wireless technologies in the data acquisition building control and automation of manufacturing processes will grow. Robots are also useful to do job in area and in situation that are hazardous for human. This paper gives an idea about designing wireless communication between a remote control and a robot. The main aim is to build a wireless robot using Arduino which can be detect obstacles, flames and chemical and the robot can be controlled by a remote control through RF module the information pass through the RF module to the operator and the LED light will glow.*

Key Words: Arduino, robot, RF Module, wireless

1. INTRODUCTION

The fundamental concept of wireless communication on a small scale. The remote control application of RF has been extended to operate a bot. The main aim of the project is to implement a wireless robot which can be controlled through remote control using RF module and navigates around the areas and tries to detect obstacles, flames, of fire and chemical.This innovative concept consist of 434MHz Transmitter and receiver pair to allow the arduino on both the ends to communicate wirelessly with each other. [1] Here the Robot can detect the obstacles through the use of ultrasonic sensors. Apart from this the Robot can detect flames of fire through the use of flames sensor. Also it will be able to detect chemicals likeH2, LPG, CH4, CO< or propane through the use of a sensors. The robot will be able to implement one of these three functions at a time.

2.METHODOLOGY

Here we show prototype model or 3 phase fault detection, so we make the fault line by using switches. We know that impedance of line is increases with increase in length. So we use resistance combination in senses, for each phase different set of resistance is used for each phase one relay is use to isolate the load at the time of fault which give exact length of fault occur on line. The mastermind of our project is Aurdino Uno. The DC supply is requiring for controlling board. Which is provides with the help of rectifier and transformer combination. Output switches is given analog pin or Aurdino (Uno) and display is also connected to digital output pin of Aurdino. So when we move fault it indicate of display with exact distance, and at a same time Aurdino give output to relay and it. disconnect load from supply. This all thing happen as soon as fault is occur in line. Due to proper program insert in Aurdino on a based. It is possible become voltages of ADE pin is changes according to flowing from line and it depends upon distance of line.

3.OBJECTIVE

- To reduce the human efforts.
- No need of microcontroller.
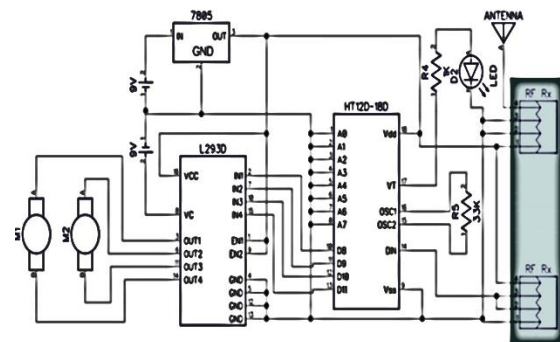- Implement without any programming language.

4.METHODOLOGY

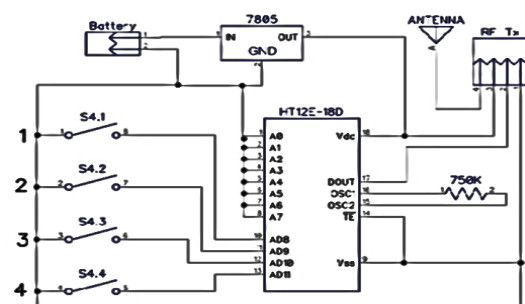**Figure 1 Circuit Diagram of Transmitter**

Figure 2 Circuit Diagram of Receiver

5.MAJOR COMPONENTS USE

- DC Motor
- HT12D
- HT12E
- RF Pair
- Motor Driver
- 9 Volt Battery
- Battery Connector
- Connecting wires
- Robot Chassis
- 7805
- 750K resistor
- 33K resistor
- 1K Resistor
- PCB
- Fire Detector
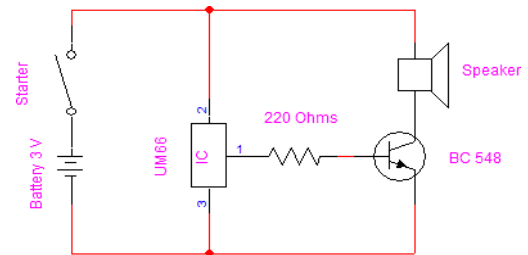- Smock Detector
- Ultrasonic
- Metal Detector

6.SENSORS USED

Fig 1. Smoke detector

Smoke detectors, or we can call smoke sensors, are frequently found in automobiles, trains, and airplanes. If the smoke sensor detects the presence of smoke while moving trains and trains, it will transmit an alarm signal to the cab for the first time.

Fig 2.fire alarm

Fire alarm system is made up of a number of devices working together to detect and warn people of fire. These alarms may be activated automatically from smoke detectors, heat detectors or through manual fire alarm activation devices such as manual call points or pull stations.
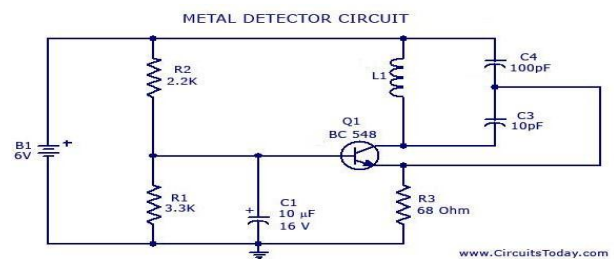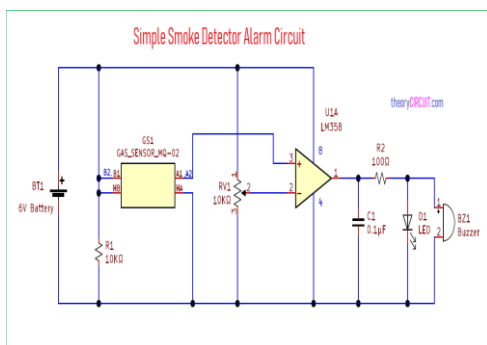

Fig 3. Metal detector

Metal Detector Sensor Metal detector sensor is referring to a special sensor or tools used in metal detectors that contains special designed circuits for detecting of metallic objects underground. Metal detector sensor maybe a search coil as in electromagnetic metal detectors.
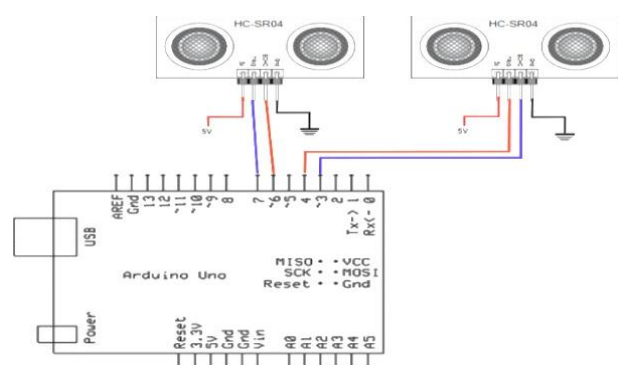

Fig 4. Ultrasonic schematic diagram

6.FUTURE SCOPE

In future we have make this project multifunctioning by using the Robotics Arms. Also we make the auto pumping when fire is detected by sensor by placing the water tank at top of the model. We have used this project

in hospital for transferring the medical substance in hazardous condition like corona etc. We have place the solar plate at the top of model for charging the batteries. Another future option for thisRobotics is the confluence of engineering and science that includes mechanical engineering, electrical engineering, computer science also it is no more an emerging field as it has evolved so much in the last 10 years and it is nearing an apex point .It is an ever growing field and many avenues have opened up in recent past. . The promise of robotics is easy to describe but hard for the mind to grasp.A robot is a mechanical or virtual intelligent agent that can perform tasks automatically or with guidance, typically by remote control. In practice a robot is usually an electro-mechanical machine that is guided by computer and electronic programming. Robots hold the promise of moving and transforming materials with the same ease as a computer program transforms data. But the grey spot remains wide when it comes to Research awareness in the field of Robotics and Automation. Sooner or later Robotics and automation will find its application in every facet of human life. The advancement in technology would bring a day of robots omnipresence. They will soon sneak everywhere from gadgets to apparels and to our very own bodies. Hence it is the responsibility of engineering community to disseminate the knowledge about the future scope and application of Robotics. The term robot is derived from Czech word "robota" which means forced labor. Nobody has ever given a precise explanation of what a robot is, although each of those definitions more or less means the same. To make things simpler, "Robot is a combination of electronics, mechanics and programming which senses it's surrounding through its sensors processes the sensor information and does something in response". The response can be locomotion or manipulation, like turning on a LED, rotating a wheel, moving an arm, raising an alarm and so on. The branch of computer science and engineering which deals with robot design, construction, application and operation is called Robotics with applications in computer science, physics, engineering, defense and even many household devices. ndustrial robots – These robots bring into play in an industrialized manufacturing atmosphere. Typically these are articulated arms particularly created for applications like- material handling, painting, welding and others.

7.ADVANTAGES

- Easy in Operation & Less Cost.
- Range of RF Module up to 20 to 200 meter
- Less in weight.
- Portable to add various sensors for multiple application

8. APPLICATION

- Robot can be used to carry payload in commercial and industrial sector.
- It can detect the smog by using Smog sensor.
- Used in Hospitals for non-contact medicine distribution.
- Used in Hotels and malls for safety and providing meals.

9.FEATURES OF TRANSMITER AND RECEIVER

RF transmeter Feature:

Frequency Range:- 433 Mhz

Output Power:- 4.16 Dbm

Input Supply:- 5 To 12 Volt Dc

RF Receiver Feature:

Sensitivity:- 105 dBm

IF Frequency:- 1 MHz

Low Power Consumption

Current 3.5 mA

Supply voltage:- 5volt

PIN DESCRIPTION

Pin Description of RFTx :

GND – Ground supply

Data In – This pin accept serial data from encoder

Vcc - +5 Voltshould be connect to this pin

Antenna – A wrapped connectto this pin for propertransmission of data

Pin Description of RF Rx:

GND – Ground

Data In – This pin give outputserial data to Decoder

Data In – This pin give outputserial data to Decoder

Vcc - +5 Voltshould be connect to this pin

Vcc - +5 Voltshould be connect to this pin

GND – Ground

GND – Ground

Antenna – A wrapped connectto this pin for properReception

CONCLUSION

The purpose of project is to control a toy car using accelerometer sensors attached to a hand glove. The sensors are intended to replace the remote control that is generally used to run the car. It will allow us to control the forward and backward, and left and right movements, while using the same accelerometer sensor to control the throttle of the car based on the hand movements. The software part was developed in Java for image processing wherein the hand gestures were analyzed to extract the actual direction. As the hand was shown as an acute angle towards the left, the robot moved towards the left direction. As the hand was shown as an acute angle towards the right, the robot moved towards the right direction. . As the hand is kept stationary with respect to the environment, the robot was in the stop mode. From the experiment, about 80% of the implementation worked according; the remaining was less due to background interference which is a negative marking to the implementation

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