Design GPS and GSM based Ambulance Tracking with Health Monitoring System

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Abstract: **The paper is used to describe the ambulance tracking with health monitoring system. With the help of this project we can find out the location of ambulance. At the same time, we can also monitor various health parameter of a patient like temperature, humidity and heart beat rate, blood pressure, Electro cardiogram, sugar. These parameters of patient are sending to hospital and also doctors mobile. At the sometime the ambulance location and ambulance number is send to the hospital. GPS is used to track the ambulance location. GSM is used to send the message to the hospital . By using these parameters, doctor can do the necessary preparation for treatment of patient.**

1 . INTRODUCTION

This project performs three main functions. First one is Patient health monitoring; second one is tracking the Ambulance which is carrying the Patient and third one is to send above two details to the Hospital or Doctor using a GSM technology. With the help of this project we can find out the location of ambulance and at the same time we can monitor various health parameter of a patient. These parameters are temperature, humidity and heart beat rate. A text SMS containing location and values of all the sensors is sent to a Doctor's mobile. Or we can send this text SMS to any authorized person in hospital. Then that person can intimate Doctor about ambulance location and patient health. By using these parameters, doctor can do the necessary preparation for treatment of patient. the ambulance will have the special route from the other primary vehicles to reach the destination. The sensors which are attached in the ambulance system will monitor the patient's health and if the status exceeds the nominal values, the GSM module send the tracked data to the other GSM unit. In This way the hospital unit will get ready to treat the patient before it reached to the hospital. The main advantage   of

this project is that it is operated on 5V DC only, which can be easily available.

Second method is advanced and recommended method of Ambulance tracking in Google map. It is efficient, convenient and useful to view the vehicle location online on internet maps. Hospital authority person can use these online maps to track the ambulance. This method is used to find out location on Google map using longitude and latitude using internet. Today's world is internet savvy world. We are more dependent and used to internet. Now-days internet is easily available, fast to access as well. Various websites are available on internet which provides online maps. Google map is one of the best and famous websites out of these all providers. Google map is a website which provides online map of the world. For ambulance tracking on online map, the hospital authority person should have computer or laptop and internet connection. Then once that person gets SMS on mobile then he/she can manually type this parameter of the SMS in Google map. Then once he/she clicks on view button, then Google map will show marker point on the exact location where the ambulance is present.

2.   EXSITING METHOD

They are some shortcomings present in existing system. Currently there are number of health monitoring system available for the ICU patient which can be used only when patient is on bed.

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This system is wired everywhere such systems are huge in size. Monitoring particular disease only this are the disadvantages of a system
.

3. PROPOSED METHOD

The main advantage of "Ambulance tracking with patient health monitoring system" is that with the help of GSM technology, the data of patient health can be sent to a longer distance through SMS. With the help of this, doctor could have all prior information ready in hand before the patient reaches to the hospital. With the use of GPS technology, the exact co- ordinates of ambulance can be tracked. And then distance from the hospital can be found out. Thus we can get / manipulate approximate time for the ambulance to reach to hospital. As this system is fully automated, it does not require any human interaction. This system receives the health parameter values, longitude and latitude and sends SMS automatically after a period interval of time.
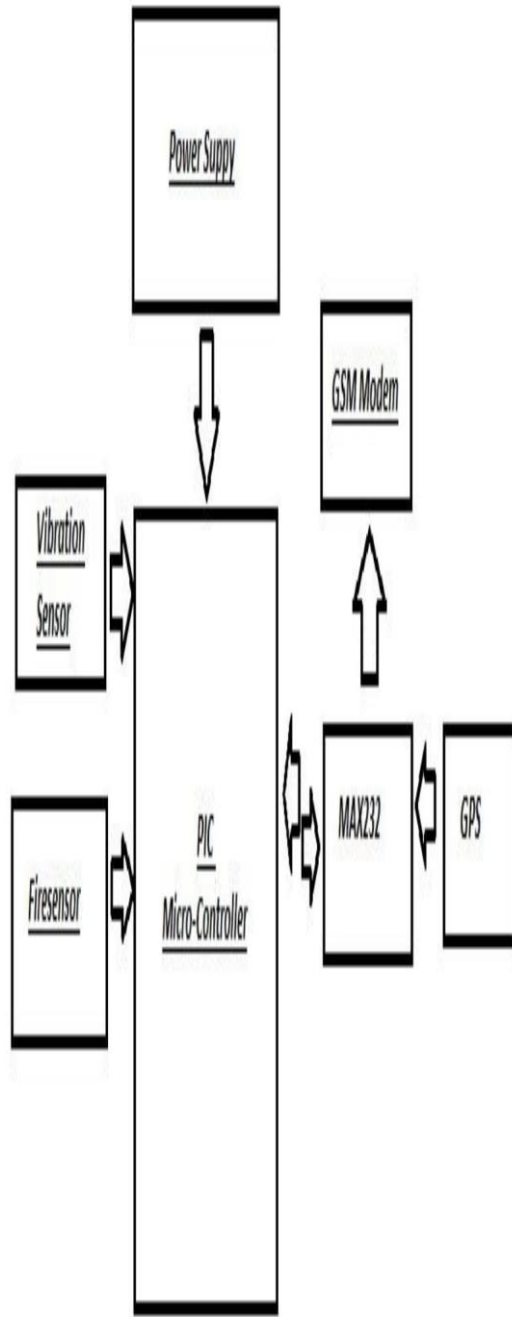

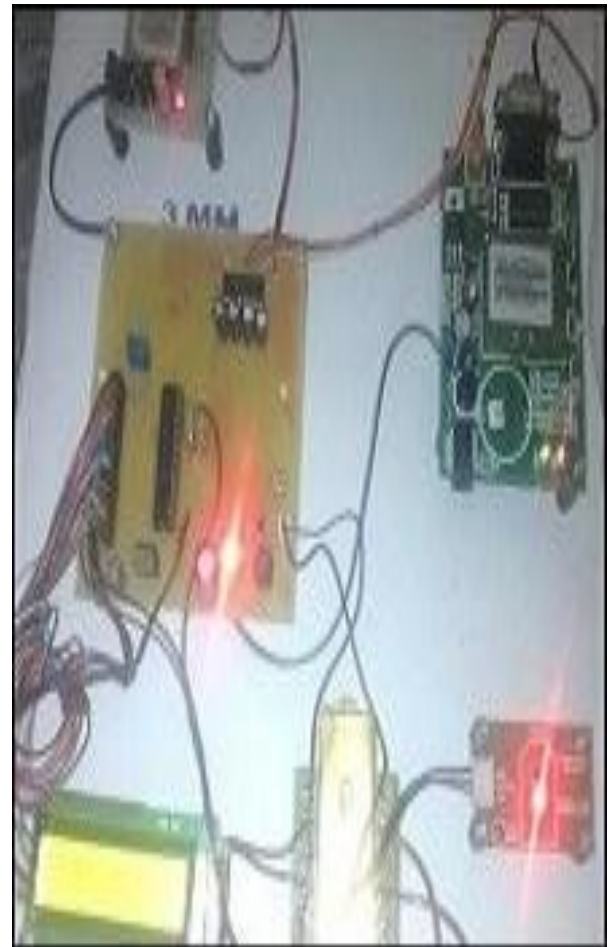Fig2: circuit for ambulance tracking with health monitoring system

Fig1:block diagram

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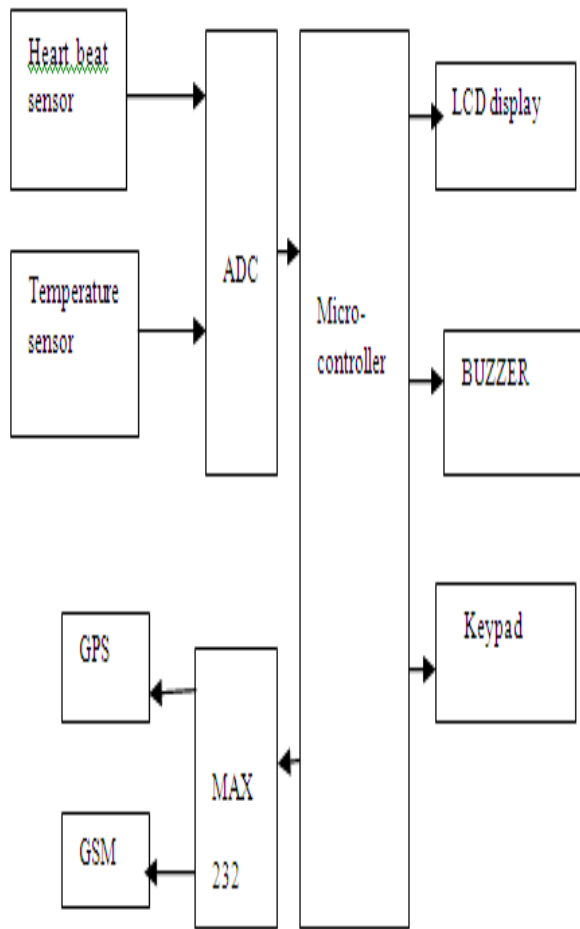
4. BLOCK DIAGRAM

Fig3:block diagram

a. GPS Modem

Main function of GPS – Global Positioning System modem is to provide longitude and latitude of the ambulance. The GPS modem receives data from satellite. And then it gives this bunch of data to Microcontroller through serial communication. As ambulance moves along the way from patient's home to hospital, the co- ordinates of ambulance location will change and these variations are given to Microcontroller.

b. GSM Modem

Main function of GSM modem is to send all parameters to user or Doctor through a text SMS. For sending SMS, Microcontroller needs to give various AT commands to GSM modem using a serial communication port.

Fig 4: GSM circuit

c. Heartbeat sensor

Heart beats are important for the health of patient. Heartbeat sensor works on a principle that blood in human body pumps with every heartbeat. We have used a Red LED and LDR. Patient needs to place his/her finger between these two components. Red light will be reflected from patient's finger to LDR. And blood will pump with every heart beat. This will cause fluctuations in the light intensity. Heart beat sensor used in this project works on the above principle. It gives out high pulses with every heartbeat. It works on pure 5 volt DC.
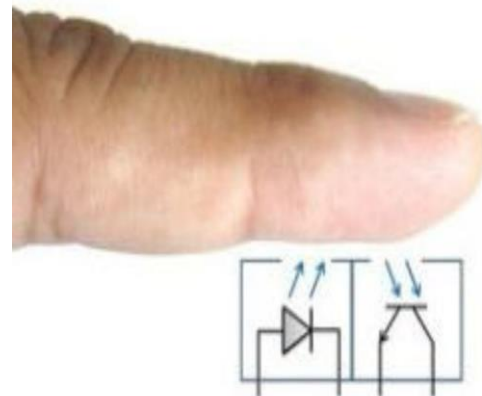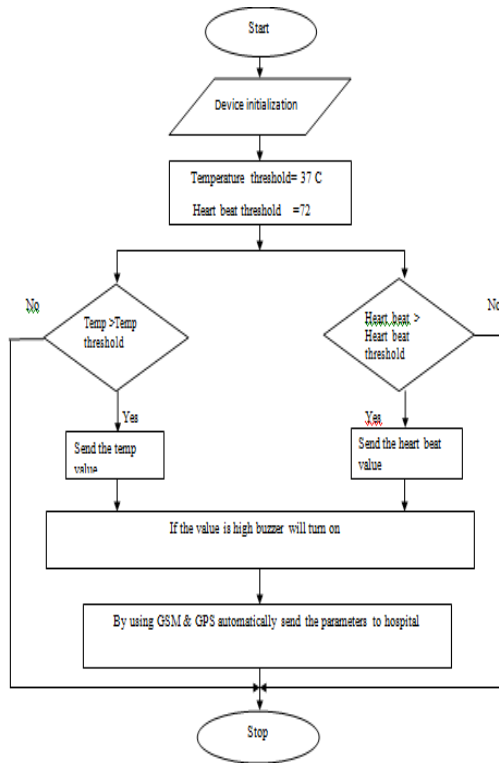

Fig 5: heart beat sens

d. Temperature sensor

We have used temperature sensor to measure the body temperature of the patient. This is an analog type of temperature sensor. It gives variable output voltage as per the variations in the temperature received / sensed. This will help to monitor the variations in the temperature of patient.

Fig 6:temperature sensor circuit diagram

e. Analog to Digital Converter

As Microcontroller is not able to read the analog signal or analog voltage, so we have to use ADC in between the Microcontroller and sensors. Function of ADC is to give digital output data corresponding to the input voltage received. Thus it converts the analog input voltage into the respective digital data. This data varies from a value of 00-Hex to FF-Hex. Thus it is compatible to the Microcontroller.

f.buzzer

Buzzer is used to give indication about the parameter crossing a threshold value. will be turned on. This is helpful so that the person near the patient in ambulance can be informed about the unwanted situation or about variation in the health parameter.

h. Amplifier

Since the output of temperature sensor is in millivolts. So we need amplifier to amplify this voltage. Output of amplifier will be given to Analog to digital converter.

i. Humidity sensor

This sensor helps to measure the humidity. This is also an analog type of sensor. It gives variable output voltage as per the variation in the humidity. The output of humidity sensor is directly given to ADC.

g. Microcontroller

Microcontroller is main heart of the system as it communicates with all input and output devices and it controls whole operation of the system of complete flow of the system. We have used 89s51 Microcontroller which is 8051 series Microcontroller. Following are the various functions of Microcontroller:
1. Reading longitude and latitude from GPS modem
2. Reading heartbeat values
3. Displaying these values on LCD display
4. Sending these values to GSM modem so that SMS can be sent to the Doctor or any authorized person in hospital.
5. To turn on buzzer when any of the sensor values cross threshold level.

5. PIN CONFIGURATION

Fig8:pin diagram

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6 FLOW CHART

7 .CONCULSION

This paper is used to save the human life for few critical minutes of tracking the location of ambulance using GPS .It also includes the heart beat rate, temperature value sense the patient health send the sms to hospital or doctor mobile phone. After sms is received means doctor can do necessary step for patient.

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