GSM based Patient Health Monitoring System

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Abstract:- *Now a days because of environmental pollutions and all other things like work pressures etc, the human health care becomes one of big problem. GSM based patient health monitoring project mainly works for allowing doctors or relatives of patient to check the status of patient health remotely. The system calculates the heartbeats and body temperature of patient and if it goes above certain limit then immediate informative alert message will be send to registered number. For this system we used AVR family microcontroller which is interfaced with LCD display, heartbeat sensor, temperature sensor. The GSM Based patient health monitoring system works with GSM modem to send the data remotely to the registered number, system powered by 12 v transformer. The system is very helpful for saving life of a patient. The system efficiently updates doctor about health of patient as well as accurately calculates the health parameter of patient.*

 Keywords— Microcontroller 89c51,Gsm modem, ADC 0804,Temperature Sensor, Heart rate and Blood pressure sensor, LCD Display , Relay, Buzzer.

I. INTRODUCTION

With the development of world, health monitoring system is used every field such as hospital, home care unit, sports. Normally it is difficult to keep track on abnormalities in heartbeat count for patient itself manually. For adults and older, a normal resting heart rate is between 60 to 100 beats per minute(bpm), depending on the persons physical condition and age. For children ages 6 to 15, the normal resting heart rate is between 70 to 100 bpm and body temperature is 37 degree Celsius or 98.6 Fahrenheit. Patients are not well versed wit manual treatment which doctors normally use for tracking the count of heartbeat. These are various instruments available in market to keep track on internal body changes. But there are many limits in maintenance part due to their heavy cost, size of instruments and mobility of patients.

So, researches design a system as portable device. Researcher designed different health monitoring system based on requirement. Different platform like Microcontrollers are used to design the system based on this performance. Different biomedical sensors like temperature sensor, heart rate sensor, blood pressure sensor are used for monitoring the health condition which is integrated on single system on-chip. If any varied change takes place it is notified. This notification would help to take an appropriate action at an instance of a time. This would save patients from the future health problem which would arise.
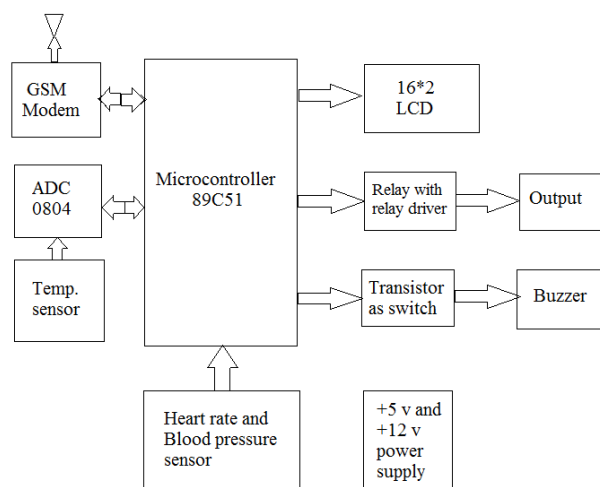

Fig. Block diagram

II. COMPONENT DESCRIPTION

2.1 Microcontroller 89C51

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C51 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.

2.2 Gsm modem:

SIM800 is quad -band GSM module designed for the global market. It works on frequencies GSM 850 MHz, EGSM 900 MHz, DCS 1800 MHz and PCS 1900MHz. SIM800 features GSM multi-slot class 12/class 10 and supports the GSM coding schemes CS-1, CS-2, CS-3 and CS-4. With a tiny configuration of 24*24*3mm, SIM800 can meet almost all the space requirements in users application, such as a M2M, smart phone, PDA and other mobile devices. SIM800 has 68 SMT pads, and provides all hardware interfaces between the module and customers' boards. SIM800 is designed with power saving technique so that the current consumption is as low as 1.2mA in sleep Mode. SIM800 integrates TCP/IP protocol and extended TCP/IP AT commands which are very useful for data transfer applications

2.3 ADC0804:

Analog to digital converters find huge application as an intermediate device to convert the signals from analog to digital form. These digital signals are used for further processing by the digital processor. Various sensors like temperature, pressure, force etc. convert the physical characteristics into electric signals that are analog in nature. ADC0804 is very commonly used 8 bit analog to digital converter. It is a single channel IC i.e., it can take only 1 analog signal as a input. The digital outputs vary from 0 to maximum of 255. The step size can be adjusted by setting the reference voltage at pin9.

2.4 Temperature sensor:

LM35 is a precision IC temperature sensor with its output proportional to temperature. The sensor circuitry is sealed and therefore it is not subjected to oxidation and other processes. With LM35, Temperature can be measured more accurately than with a thermistor. It also possess low self heating and does not cause more than 0.1^0C temperature rise in still air. The operating temperature range is from -55^0C to 150^0C. The output voltage varies by 10mV in response to every C rise/fall in ambient temperature, i.e., its scale factor is $0.01V/^0$C

2.5 Heart rate and blood pressure sensor:

Heart beat sensor: It is designed to give digital output of heart beat when a figure is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the beat per minute (bpm) rate. It works on a principle of light modulation by blood flow through finger at each pulse.

Blood pressure sensor: Blood pressure is the pressure of the blood in the arteries as it is pumped around the body by the heart. When your heart beats, it contracts and pushes blood through the arteries to the rest of your body. This force creates pressure on the arteries. Blood pressure is recorded as two numbers –the systolic pressure (as the heart beats) over the diastolic pressure (as the heart relaxes between beats). The unit which measures this is called sphygmomanometei. Monitoring blood pressure at home is important for many people, specially if you have high blood pressure. Blood pressure does not stay the same all the time. It changes to meet your body's needs. It is affected by various factors including body position, breathing or emotional state, exercise and sleep. It is best to measure blood pressure when you are relaxed and seating or lying down.

Fig. Heart rate and Blood pressure sensor

2.6 LCD display:

This display contains two internal byte wise resisters, One for the commands (RS=0) and second for character to be displayed (RS=1). It also contains a user programmed RAM area (the character RAM) that can be programmed to generate any desired character that can form using a dot matrix. To distinguish between these two data areas, the hex command byte 80H will be used to signify that display RAM address 00H is chosen. Port 1 is used to furnish the command or data byte, and ports 3.2 to 3.4 furnish register select and read/write levels. The display takes varying amounts of time to accomplish the functions. LCD bit 7 is monitored for a logic high (Busy) to ensure the display is not overwritten

2.7 Relay:

A relay is an electrical switch that uses an electromagnet to move the switch from the off to on position instead of person moving the switch. It takes a relatively small amount of power to turn on relay but the relay can control something that draws much more power.

2.8 Buzzer:

The PS series are high-performance buzzers that employ unimorph-piezoelectric elements and are designed for easy incorporation into various circuit. They features extremely low power consumption in comparison to electromagnetic units. Because these buzzers are designed for external excitation, the same part can serve as both a musical tone oscillator and a buzzer. They can be used with automated inserters. Moistour-resistant models are also available. The lead wire type (PS1550L40N) with both-sided adhesive tape installed easily is prepared.

III. CONCLUSIONS

The planning, design, implementation/execution of this project is really a tough one. The configuration of the various units into one unit to obtain a desired output of detecting the heartbeat rate through pulses from the blood vessels on the wrist/thumb.

Thus, this device (integrated with modern technology) have been initiated to help in regularizing the health condition of most individuals by keeping track of their heartbeat rate condition as well as a monitoring of blood pressure.

From this proposed system, it is conclude that Wireless sensor technology is emerging as a significant element of healthcare services. In this proposed system a mobile physiological monitoring system is presented, which is able to

continuously monitor the patients heart beat, blood pressure and other critical parameters in the hospital. The system is able to carry out a long-tem monitoring on patients condition and is equipped with an emergency rescue mechanism using SMS.

IV. ACKNOWLEDMENT

V. REFERENCES

[1] Prashant Patil, Rohan Waichal, Utkarsha Kumbhar, Vaidehi Gadkari," Patient Health MONITORING System using IOT" 2017 , An International Research Journal of Engineering and Technology(IRJET) Volume :04 Issue:L01|Jan 2017.

[2] Prachita M.Y. "IoT Based Heart Attack Detection , Heart Rate and Temperature Monitor",2017 International Journal of Computer Applications(0975-8887), Volume 170- No.5,July 2017.

[3] Dr. A. A. Gurjar, Neha A. Sarnaik ,"Heart Attack Detection By Heartbeat sensing using IoT" ,An International Research Journal of Engineering and Technology(IRJET), Volume :05 Issue:03|Mar_2018, Impact Factor value:6.171, ISO9001:2008 Certified Journal.

[4] Kashif Habib, ArildTorjusen, Wolfgang Leister, "Security Analysis of a Patient Monitoring system for IoT in e-health", the 7th International conference on e-health, telemedicine, and social medicine, copyright© IARIA,2015.