

Real Time Health Monitoring System Using ARM7

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ABSTRACT

Aged people or physically ill people and the people suffering from some serious diseases are not able to move or usually confined to their homes, due to their health conditions. They are put into a helpless condition when they need to go out for even small work. This paper deals with the design and development of GSM based embedded system for simulate Blood pressure and Heart beat monitoring. This system is continuously monitor the health parameters like blood pressure and heart bit by using ARM processor and send to the care taker using GSM.

Keywords: Blood pressure module, GSM modem, Heart bit sensor, ARM processor.

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I. INTRODUCTION

Nowadays, the use of a vital sign's monitor is very common and not only used at the hospitals as a monitoring system for patients. Actually the need of heart rate measurement is for the persons who have problems of heart and the need to care about their heart. The early detection of abnormal heart rate can help to prevent from serious disease like. The heart monitor is needed to give the range of heart rate. This range of heart rate should be match with the normal rate to secure from serious injury. Such digital display of target heart rate did not provide for ease of reading the display under the most conditions. The propose of this to under the innovation to face to this problem by providing the novel wearable biomedical signal sensor device for monitoring heart rate, blood pressure at home very simply or easily. Which display the heart rate by using LED-LDR sensors and enabling the user an indication of if any abnormality through GSM, and also blood pressure also monitored. The proposed innovation will be programmed to automatically suggest the user about their health conditions. In this research work, we developed a couple

of sensors for measurement heart bit rate, blood pressure. The blood pressure and heart bit rate measured by the sensors given to the ADC through controller and proceed on it and this data is then send to the doctor via GSM. Then by doctor will check abnormality of patient and suggest proper drugs or provide the ambulance for very critical condition.

II. SYSTEM ARCHITECTURE

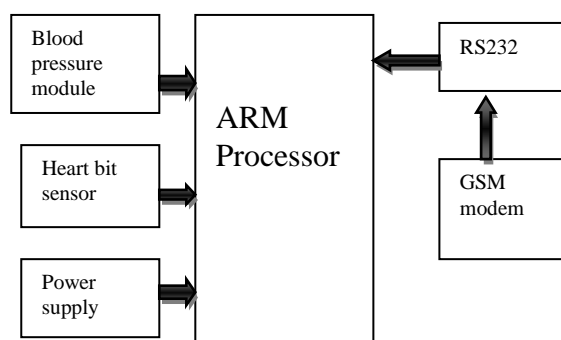


Fig 1 system architecture of total system

The above fig1.shows the system architecture of real time health monitoring system in which there are two sensors of blood pressure and heart bit are continuously monitor the blood pressure and heart rate and this parameters are gives to the controller. The arm processor receives the readings and forwarded to the doctor by using GSM Modem. The arm processor sends the parameters of heart bit and blood pressure only when patient is abnormal. By observing the parameter doctor will suggest the proper drugs.

A. HEART BIT SENSOR

The heartbeat sensor circuit consist of a light detector and a bright red led. The led needs to be of super bright intensity because maximum light passes and spreads if a finger placed on the led is detected by the detector now, when the heart pumps blood through the blood vessels , the finger becomes slightly more opaque; due to this, less amount of light reaches from the LED to the detector. The detected signal is converted into an electrical signal. This pulses gets first amplified and then triggered by using an amplifier which gives an output of +5V logic level signal. The output signal is also directed by a LED display which blinks on each heartbeat rate.

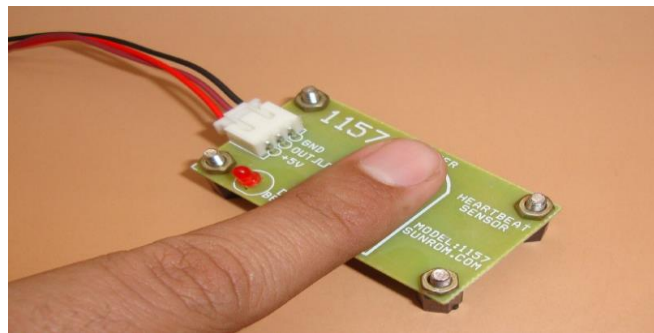


Fig 2 heart bit sensor diagram.

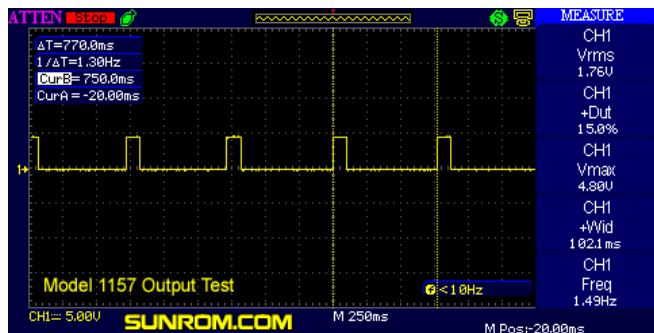


Fig 3 output window of heart bit sensor.

B. BLOOD PRESSURE MODULE

Blood Pressure & heart rate pulses are shown on display with serial out for external projects of ARM circuit processing and display shows Systolic, Diastolic and Pulse readings. This module is fit like hand watch on our hand. It is easy to use wrist style that eliminates pumping.

Features:

- Intelligent automatic compression and decompression.
- Operated only one button (START), so it is easy to operate.

- Total memory groups are 60.
- Can read single or all measures.
- 3 minutes automatic power saving device.
- Intelligent device debugging, automatic power to detect.
- Easy to Read Display.
- Fully Automatic, High clinical Accuracy.
- Operating voltage: +5V DC.
- Serial digital output data.



Fig 4 Blood pressure module.

Blood pressure basics:

The heart is pumped around the body due to which it produces pressure on arteries of blood is called blood pressure. 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 Sphygmomanometer.

Monitoring of blood pressure is very necessary to the patient which is faces the problems of breathing by doing extra work. So it is very efficient to measure the blood pressure at home by using this module.

Classification of blood pressure for adults (18 years and older)

	Systolic(mm Hg)	Diastolic(mm Hg)
Hypotension	<90	<60
Desired	90-119	60-79
PreHypertension	120-135	80-89
Stage 1 Hypertension	140-159	90-99
Stage 2 Hypertension	160-179	100-109
Hypertensive Crisis	>= 180	>=110

Due to high blood pressure there is possibility of suffering from lots of disease like kidney, stroke and heart attack so there is need to check the blood pressure continuously at home.

C.ARM CONTROLLER

Here we use the LPC2148 arm7 processor to monitor the parameters of heart bit sensor and blood pressure module by interfacing the sensor with it. LPC2148 is supported in built USB2.0 and also it has two serial port.GSM module is interfacing with it to send the data to doctors or care tares mobile phone.

C. GSM MODEM

The long form of GSM is Global System for Mobile communication. Most GSM uses frequency band of 900 MHz or 1800 MHz. This GSM modem can accept any GSM network operators SIM card and act just like a mobile phone. The modem uses RS232 standard for communication. The modem can be connected to serial port of PC or to any controller. GSM modem is used to send and receive SMS or to make/receive voice calls by using AT command. It can also be used as GPRS modem to connect to internet.

III.FLOW CHART

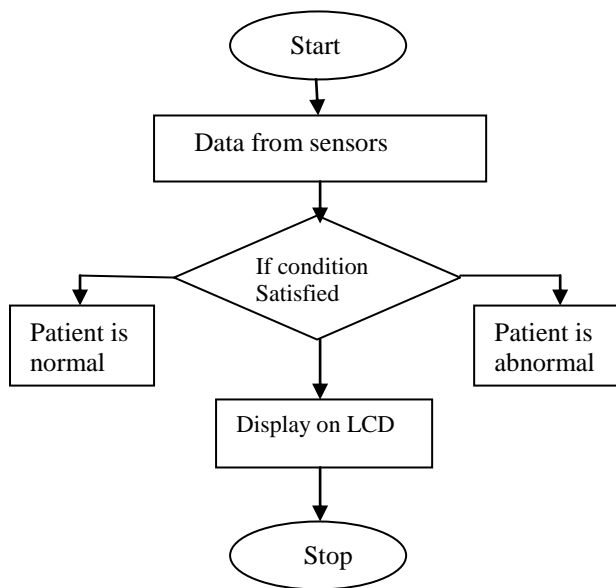


Fig 5 Flow chart for total system.

IV.FUTURE SCOPE

In this system if we interface GPS module then, we can identify the exact location of patient. This is applicable in soldiers in arm forces to find the exact location of injured soldier. This is also applicable in large hospitals in which there is large no of wards, there is not possible to visit every ward to every time by doctor.

V. CONCLUSION

This paper presents the implementation of an Blood Pressure and Heart Rate Measurement System involving low cost modules, Processor, GSM and LCD Display. This project was successfully implemented and the output displayed was LCD display and if required parameter is send to care taker using GSM.

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