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An Intelligent Medical Monitoring System Based Upon Zigbee, and Automatic Message using GSM

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Abstract: In this project we are implementing and introducing a new method of take caring a patient even from the remote areas. In this the main aim is to monitor the patient condition and serving him according to his/her condition, here we monitor some basic biomedical parameters like heart beat and respiration. Based on these measured values using the sensors we or doctor take care about the patient and we install a circuit which consists of zigbee, wireless cam at patient's bed to transfer the data to the doctor and concerned care taker. At the doctor's side we have a pc in which we program with labview software to observe the patient's data that was received through the zigbee device according to that data doctor will respond. With this we are automating the way of take caring a patient when he was in trouble. Monitoring the patient's condition can be done by using biomedical telemetry method where there is a mobile communication between microcontrollers. The temperature, heart beat and blood pressure are all sensed by using the appropriate sensors which are placed near the patient's body that is under investigation. The biomedical telemetry system consists of temperature sensor, heart beat sensor, pressure sensor, A/D converter, signal conditioning circuit, microcontroller, data cable, mobile phone, LCD display.

Keywords: Bio-Medical, Blood Pressure, Heart Beat Monitoring.

I. INTRODUCTION

This circuit is designed to measure the heart rate. The heart rate is measured by IR transmitter and receiver. Infrared transmitter is one type of LED which emits infrared rays generally called as IR Transmitter. Similarly IR Receiver is used to receive the IR rays transmitted by the IR transmitter. One important point is both IR transmitter and receiver should be placed straight line to each other. The IR transmitter and receiver are placed in the pulse rate sensor. When you want measure the pulse rate, the pulse rate sensor has to be clipped in the finger. The IR receiver is connected to the Vcc through the resistor which acts as potential divider. The potential divider output is connected to amplifier section. When supply is ON the IR transmitter passes the rays to the receiver. Depending on the blood flow, the IR rays are interrupted. Due to that IR receiver conduction is interrupted so variable pulse signals are generated in the potential divider point which is given to A1 amplifier through the capacitor C1.

The coupling capacitor C1 is used to block the DC component because the capacitor reactance is depends on the frequency. For DC component the frequency is zero so the reactance is infinity now capacitor acts as open circuit for DC component. The amplifier section is constructed by the LM 324 quad operational amplifier. It consists of four independent, high gains and internally frequency compensated operational amplifiers named as A1, A2, A3 and A4 amplifiers. The varying pulse from the potential divider is amplified by the A1 amplifier. In this amplifier the capacitor C2 is connected in parallel with feedback resistor to filter the any DC component in the amplified signal. If any spikes in the amplified signals, they are further filtered by the C3 and C4 capacitors. After filtration the signal is again amplified by the A2 amplifier. Then amplified signal is given to inverting input terminal of comparator. The comparator is constructed by the A4 amplifier in which the reference voltage is given to non inverting input terminal.

The reference voltage is generated by the A3 amplifier. Then the comparator compares the two signal and delivered the +12v to -12v square wave pulse at its output. Then the square wave signal is given to base of the BC 557 and BC547 switching transistors in order to convert the TTL voltage 0 to 5v level. Finally the TTL output is given to MM 74C04 inverter to invert the square pulse. Then the final square wave signal is given to microcontroller or other interfacing circuit in order to monitor the heart rate. Heart beat sensor is designed to give digital output of heat beat when a finger 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 Beats Per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

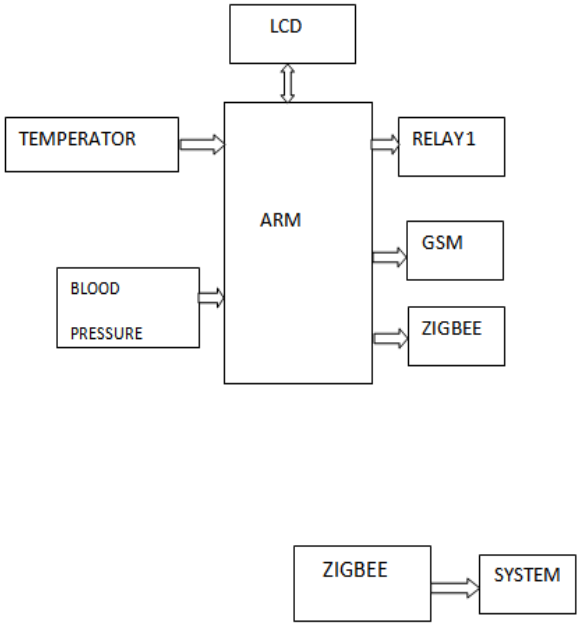

Fig.1. frequency of the cardiac cycle.

II. HEART RATE

Heart rate is a term used to describe the frequency of the cardiac cycle. It is considered one of the four vital signs. Usually it is calculated as the number of contractions (heart beats) of the heart in one minute and expressed as "beats per minute" (bpm). See "Heart" for information on embryofetal heart rates. The heart beats up to 120 times per minute in childhood. When resting, the adult human heart beats at about 70 bpm (males) and 75 bpm (females), but this rate varies among people. However, the reference range is normally between 60 bpm (if less termed bradycardia) and 100 bpm (if greater, termed tachycardia). Resting heart rates can be significantly lower in athletes. The infant/neonatal rate of heartbeat is around 130-150 bpm, the toddler's about 100–130 bpm, the older child's about 90–110 bpm, and the adolescent's about 80–100 bpm. The pulse is the most straightforward way of measuring the heart rate, but it can be deceptive when some heart beats do not have much cardiac output. In these cases (as happens in some arrhythmias), the heart rate may be considerably higher than the pulse rate.

The temperature sensor is used to sense the temperature value of the patient's body .The sensed output is given to A/D converter where the analog signal is converted to digital signal. The digital output is given to microcontroller. The microcontroller delivers the signal for mobile phone through data cable. Then the signal is transmitted to other mobile through GSM network. The receiver mobile receives the signal and it is given for a PC. The signal from data cable is given to PC and the value gets displayed using monitor. The pressure sensor is used to sense the pressure value of the patient's body .The sensed output is given to A/D converter where the analog signal is converted to digital signal. The digital output is given to microcontroller. The microcontroller delivers the signal for mobile phone through data cable. Then the signal is transmitted to other mobile through GSM network. The receiver mobile receives the signal and it is given for a PC. The signal from data cable is given to PC and the value gets displayed using monitor. Heart beat can be sensed by using heart beat sensor which is then given to a signal conditioning circuit as shown in Fig.1. This unit delivers a train of pulses to microcontroller and the value gets displayed using LCD display.

III. CONCLUSION

The remote wireless health monitoring system was able to successfully monitor the change in the patient's health status and transmit vital signs via RS232 communication to a local PC for display and evaluation. When aberration is detected this proposed system is successfully sending SMS to the doctor via SMS gateway. During the normal time, the system is automatically updating or transmitting the readings to a hospital central server via Internet. And also this proposed system successfully enabling the doctor whoever in the remote location to monitor the patient's physiological condition.

IV. REFERENCES

[1] Khuzadi, M, "On health monitoring", Aerospace Conference, 2008 IEEE, 1-8 March 2008, pp 1 – 8.

[2] Hata, Y.; Yamaguchi, H.; Kobashi, S.; Taniguchi, K.; Nakajima, H, "A human health monitoring system of systems in bed", System of Systems Engineering, 2008. SoSE '08. IEEE International Conference on 2-4 June 2008, pp 1 – 6.

[3] Hoang, D.B, "Wireless technologies and architectures for health monitoring systems", Digital Society, 2007. ICDS '07, First International Conference on the 2-6 Jan. 2007 pp 6 – 6.

[4] Nambu, M.; Nakajima, K.; Kawarada, A.; Tamura, T, "The automatic health monitoring system for home health care", Information Technology Applications in Biomedicine, 2000. Proceedings. 2000 IEEE EMBS International Conference on 9-10 Nov. 2000 pp 79 – 82.

[5] Ya-Ti Peng; Sow, D.M, "Data scaling in remote health monitoring systems" Circuits and Systems, 2008. ISCAS 2008. IEEE International Symposium on 18-21 May 2008 pp 2042 – 2045.

[6] Krco, S.; Kostic, S.; Sakac, D.; Lukic, Z, "mSens Mobile Health Monitoring System**",** Computer as a Tool, 2005. EUROCON 2005. The International Conference on Volume 1, 21-24 Nov. 2005 pp 80 – 83.