PATIENT MONITORING SYSTEM BASED ON WIRELESS SAW RADIO FREQUENCY WITH GSM

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ABSTRACT

This article endow with healthcare the system to exploit the quality and breadth of healthcare centre's by controlling expenditure, long waiting time for hospitalization or ambulatory patient monitoring / treatment, are other well-known issues for both the healthcare centre's or institutions and the patients. As the growth of population rises day by day and demand for services also rises, in order to maintain the quality and availability of care, while effectively managing economic and human resources, is accomplish by this project. The use of recent network technology in this perspective is the sole decisive factor that makes such communication system successful.

Keywords: *Multi-parameter Patient Monitoring, Recent Communication Technology, Surface Acoustic Wave based Radio Frequency, Modem.*

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1. INTRODUCTION

2.

This proposed idea is used in the Operation Theatres (OT) or in Intensive Care Unit (ICU) to identify and monitor the essential parameters of the patients such as Electrocardiogram (ECG), Respiratory Rate (RR), Heart Beat Rate (HBR), Blood Pressure Rate (BP) & Body Temperature (BT) of the patient. The sensor used for this detection can be simply housed on the patient's finger. The sensor detects pumping of the heart and produces a voltage output. This is then transferred to the computer. In the computer the output is plotted with respect to the real time to the ECG, respiratory rate, heart beat rate, blood pressure and temperature. The parameters measurement per minute is also given on the computer.

This information can be stored on the computer and can be used to analyze a status of the patient. The complete information can be sent to doctors, hospitals and parent (guardian) mobile phone. It is mainly used to detect the ECG, respiratory rate, blood pressure rate& temperature of the patient.

2. BLOCK DIAGRAM

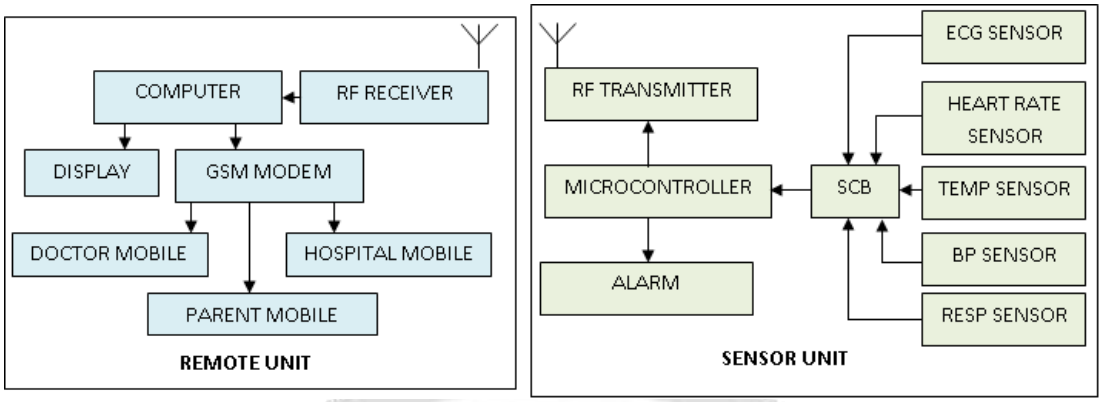

Fig-1: Block diagram of proposed method

3. EXPLANATION

The different parameters of the patient are measured through three categories, Initially Sensors Silver Chloride Electrode, second Infrared Ray Detector & Emitter and finally bead thermistor. The sensor used to detect each parameter which can be simply housed on the patient's finger. The sensor detects pumping of the heart and produces a voltage output.

The output is fed to Microcontroller (PIC 16F877) where it is processed. It's supported with a full range of hardware and software development tools. To communicate with microcontroller, I used MAX232 serial port of the computer by RF Transmitter and Receiver. The RF transmitter and receiver are the main component of my device. This method is safer rather than communicating through FM Transmitter and Receiver. Because the receiver can sense any FM signal which may lead to wrong readings. Since the RF transmitter and receiver are kept in straight angle there will not be any interference of other signals. High performance SAW based architecture with a maximum range of 200 feet at 2750 bps data rate. The output given to the computer is saved and the status of the patient is analyzed. In case of abnormal conditions the patients report is send through SMS to doctors and hospitals mobile phone through GSM modem.

GSM Modem is a cellular wireless modem working under GSM networks. Providing CSD connection or SMS application for industrial application M2M field. The Global System for Mobile Communications Service is the most widely adopted, digital cellular technology in use today. GSM modem uses time and frequency division techniques (TDMA and FDMA) to optimize the call carrying capacity of a wireless network. GSM also provides a number of carefully standardized and broadly supported capabilities such as Short Message Service (SMS), circuit switched data (CSD) and General Packet Radio Services (GPRS).

3.1 Transmitter Section

Each of the two transmitters is a CMOS inverter powered by + 10V internally generated supply. The input is TTL and CMOS compatible with a logic threshold of about 26% of Vcc. The input if an unused transmitter section can be left unconnected: an internal 400KΩ pull up resistor connected between the transistor input and Vcc will pull the input high forming the unused transistor output low. The open circuit output voltage swing is guaranteed to meet the RS232 specification + 5v output swing under the worst of both transmitter driving the 3KΩ. Minimum load impedance, the Vcc input at 4.5V and maximum allowable ambient temperature typical voltage with 5KΩ and Vcc= +.9 v. The slow rate at output is limited to less than 30V/µs and the powered done output impedance will be a minimum of 300Ω with +2V applied to the output with Vcc =0V.The outputs are short circuit protected and can be short circuited to ground indefinitely.

3.2 Receiver section

The two receivers fully conform to RS232 specifications. They're input impedance is between 3KΩ either with or without 5V power applied and their switching threshold is within the +3V of RS232 specification. To ensure

compatibility with either RS232 IIP or TTl\CMOS input. The MAX232 receivers have VIL of 0.8V and VIH of 2.4V the receivers have 0.5V of hysteresis to improve noise rejection.
The TTL\CMOS compatible output of receiver will be low whenever the RS232 input is greater than 2.4V. The receiver output will be high when input is floating or driven between +0.8V and –30V.

4. CONCLUSION

This proposed idea, I conclude that it can be one of the best techniques for medical application where the doctors can analyze the patient condition from the place where they are sitting and hence proper and timely Medicare to the patient can be given so that percentage of patient death can be reduced to larger extent. In the computer the output is plotted with respect to the real time to the heart beat rate. The Heartbeat Rate per minute is also given on the computer. The information can be stored on the computer and can be used to analyze a status of the patient. It also has an alarm to remind the bystander or nurse the abnormal condition of the patient. It is mainly used to detect the ECG, respiratory rate, blood pressure rate& temperature of the patient. The complete information can be sent to doctors and hospitals mobile phone.

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