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Health Monitoring by Using Renesas

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ABSTRACT: In these times with modern technologies the life sort of people has changed. In their busy schedule there is no time for them to consistent medical checkup. So there is a necessity for brand fresh modern idea & technology in medical field which helps people in saving their time and to remain their health condition stable or in fitness.In this proposed project, we use three diverse sensors to observe the patient's health like body temperature, pulse, wet condition of patient. They were controlled by microcontroller. System implemented in this project is made for such patients who aren't within the traditional state but they need to be monitored continuously. When the critical condition occurs, system will originate an alarming message and send it to the doctor in conjunction with patient location and also health parameters displayed in LCD display. It's fast, less costly and monitors patient remotely from their homes. We might wish to reduce the worth of the health monitoring kit available within the market which ends up in cost effective and efficient health and that we tend to supply Society the specified tools so on develop new E-Health applications and products.

KEYWORDS: Medical, Health, Patient, Doctor, Sensors, Monitor.

I.INTRODUCTION

World is advancing extremely fast today. Each field of life is improved concerning its past and altered into more agreeable and advanced than previously. Among all fields, medical field is likewise gaining quick ground and getting progressively inventive. Along these lines, the use of remote innovation is upgraded to deal with the difficulty of remote area. Remote Patient Monitoring (RPM) is an innovation that empowers us to screen tolerant outside of center or on the opposite hand emergency clinic that is without visiting a hospital patient can check health condition. It's going to increase access to health services and facilities while diminishing expense. Remote Patient Monitoring spares time of patient and specialist, consequently expanding proficiency and unwavering quality of wellbeing administrations, hence increasing efficiency and reliability of health services. As populace and infections are expanding step by step within the hour of health related crises happen around is also increasing. Typically our Hospitals aren't completely prepared to offer each ailment and medications given to patients aren't acceptable. Indispensable ailments are the one where patient need ceaseless observing of its body wellbeing parameters like sugar level, coronary illness then on. Adequate specialists aren't accessible to see every patient independently and with Fulfillment. The framework proposed in this paper fundamentally help those patients and their wellbeing parameters are often observed remotely. Enormous numbers of patients are often observed from remote area whenever by a solitary specialist and may be cautioned if there should be an event of any disturbing circumstance. The most focus of this paper is to explain the appliance of GSM and GPS in medical field. In this system, a selected gadget equipped with different sensors is given to patient. It will monitor the health parameters of the patient and keep it up updating the values. When any specific parameter will rise above the sting value, a warning message are going to be sent to the doctor or loved one. This will much needed device during the emergency condition and saves time for both patient and doctor.

II.MOTIVATION

The motivation to take up this paper is the society is equipped with the aid of capacity of immoderate expenses for its health system and a shrinking work force due to health reasons and an aging population. These aspects put a significant strain on the monetary laptop and the social system. Personal lifestyle and environmental influence factors are the most huge threat factors influencing health status. The fragmentation of understanding about personal risk factors hinders the assessment of sickness risks. In order to determine on preventive or corrective actions, medical practitioner required to attain all applicable user-individual knowledge. Relevant expertise sources encompass health records, patient records, databases on environmental information, wearable or portable gadgets for health monitoring, and common ubiquitous internet choices which consists of client generated information. Thus our crew has been inspired to deliver up this totally unique strategy of remotely sensing different parameters of health in most of the feasible way. It ambitions in the enhancement of a platform for individualized personal healthcare services.

III.METODOLOGY

To enforce this E-Health system to observe certain health parameters it considers board based on R8C27 group family. This microcontroller board having ADC that converts the sensors input analog signals to digital signals. There are sequences of temperature sensor, right here the proposed paper uses a NTC Thermistor. It is sensitive to the surrounding temperature, are in many conditions used to turn out to be conscious of the temperature. This is given to the controller for non-stop monitoring.
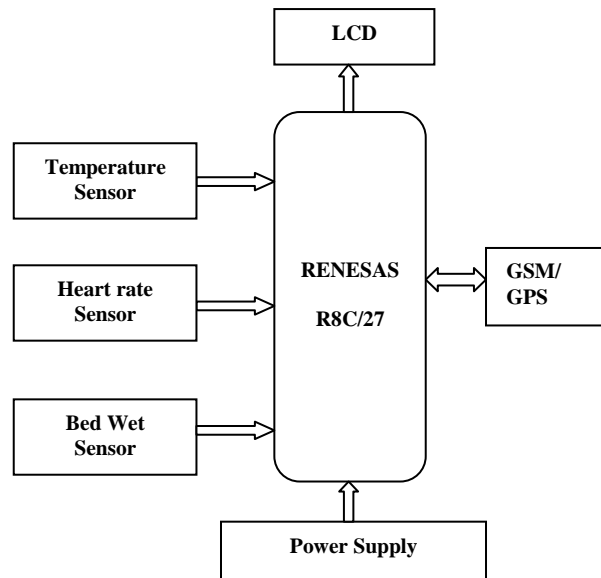
Fig. 1 Block diagram

The heart beat sensor used to measure of pulse rate. Sensor detects the waft of blood by way of the usage of the finger. As the heart forces blood with the aid of the blood vessels in the finger, the volume of blood in the finger changes with time. Wet Sensor module allows to measure moisture via analog output pins and it provides a digital output when a threshold of moisture exceeds. It works on the principle of resistance. It includes the electronics module and a printed circuit board that collects the water drops. As it come to wet and collected on the circuit board, they create paths of parallel resistance that are measured through the op-amp and it will experience the wetness and signal is sent.
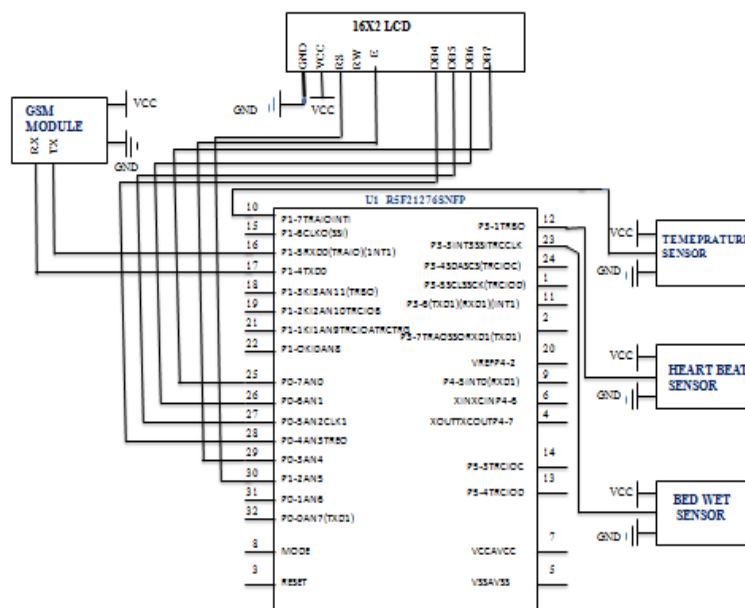

Fig. 2 Pin diagram

The GSM module is used to furnish the records of the patient like the heartbeat rate and the body temperature and wet position from a remote location. It is comparable to a cell which requires a SIM card for its operation however the gain of GSM module over cellular is that it has an serial connectivity that can be barring prolong related to the Micro controller for sending the AT instruction for sending SMS.The regionor place of the patient can be tracked with the assist of a GPS module. The GPS module receives the signals from the satellite and then location of patient and sends it to the controller.

IV. MODULE DISCRIPTION

A)Renesas Microcontroller Board:
The microcontroller used right here is Renesas microcontroller. This is primarily based on R8C27 group family and it used for the enhancement of embedded structures through potential of way of the use of standard RENESAS. This board supports RS232 and USB dialog with the aid of which we will download code/debug. Different health associated sensors which measures heartbeat, body temperature and Wet condition of a patient which is controlled via a microcontroller. Every health parameter readings are displayed in LCD monitor. LCD attribute is controlled by microcontroller.
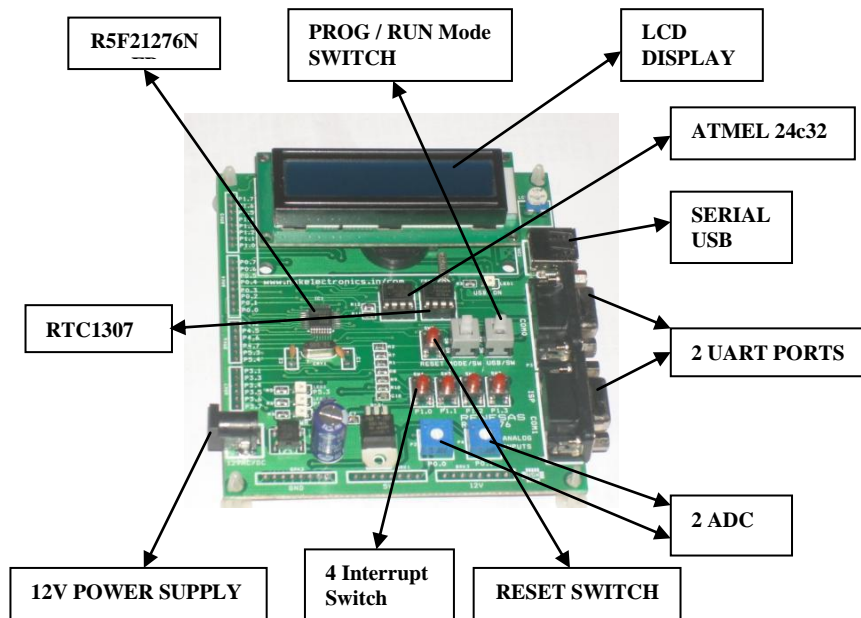
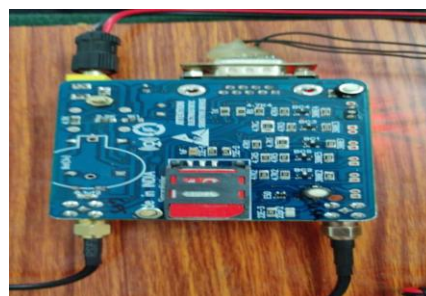Fig. 3 Renesas Board

B) SIM808 GSM/GPS Modem:

Fig. 4 GPS/GSM Modem

SIM808 module is a whole GSM/GPRS module which combines GPS technology for satellite navigation. It is mainly used for cellular communication purpose. World system for cellular communication (GSM) approves send and acquires information from a microcontroller. Global positioning device (GPS) lets in variable belongings to be tracked

seamlessly at any place and whenever with signal coverage. It is having elements like GSM standard AT Commands, Network and Ring LED, Rugged Sim card Holder. It needs a SIM (Subscriber Identity Module) card and cellular phones in order to communication with the network.

C) Heart Beat Sensing Component:

Fig. 5 Heart Beat Sensor

Heartbeat sensor gives a trouble free way to learn about the attribute of the heart which can be measured based on the precept of psycho-physiological signal used as a stimulus for the virtual- reality system. This sensor used infrared light source on one facet of finger and a photo detector on any distinct factor to measure this alternate in the blood flowing. The quantity of the blood in the finger changes with appreciates to time. The Sensor is Based IR molded in silicon, so as soon as the Finger is inserted Heart Beat is taken. In order to calculate the heart rate based on the blood glide to the fingertip, a heart-rate sensor is mild weight sensor assembled with the assist of Op-amp for monitoring the heart beat pulses.

D) Wet Condition Sensing Component:

Fig. 6 Wet Sensor

Wet sensor is essentially a board on which nickel is coated in the structure of lines. It works on the resistance principle. The module is primarily based on the LM393 op amp, with bed-wetting alarms; an exclusive moisture sensor triggers and offers indication. The sensor is a resistive dipole that indicates much less resistance when moist and increased resistance when dry. When there is no water content on board it increases the Resistance so we receive excessive voltage according to V=IR. When wet present on the board it reduces the resistance due to fact water. Water is a good conductor of electricity and presence of water connects nickel traces in parallel so decreases resistance and reduces voltage drop across it.

E) Temperature sensing Component:

Temperature sensing aspect additionally is a device that is used mainly to proceed to be the hotness or coldness of item or object. The Temperature can be detected with the assist of a temperature sensor. This is precision built in circuit temperature sensors. The body biosensor as it is a low price temperature sensor and it does not require signal conditioning. This is built with a series of integrated circuits that senses the surrounding temperature of the field. In this sensor measure the temperature of a patient which is connected directly to the microcontroller for non-stop monitoring.
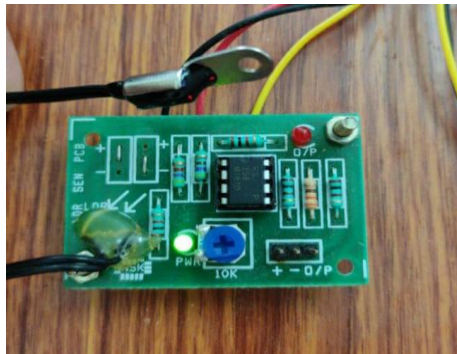
Fig. 7 Temperature sensor

V. RESULT AND DISCUSSION

Implemented circuit Initialization shown in figure.8. The usage of this device is easier. Make sure that SIM is present in the GSM module. When we switch on and press reset button. It starts to SIM modem initialization and SIM registration or if SIM is not properly inserted which is also shown in LCD display and we can also check by pressing first switch in the kit whether SIM registered and GPS initialized or not.
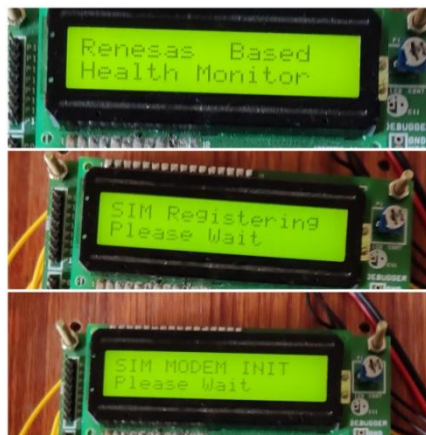

Fig.8 Implemented circuit Initialization.

After that for checking health parameters like heart beat first put your finger inside the pouch of the heart beat sensor and then press second switch it starts talking heart rate for 60sec. which is as shown in figure if it is below 60 or more than 100 then message will sent to doctor along with pulse rate and location of patient. As shown in figure different health parameters like body temperature if it is more than the critical value it will send message like temperature is high. And also ifbed is wet it will send message which is as sown in figure 9.

And if any emergency situation or in case of any patient visit at that time also we can get patient location if we send proper valid textual content SEND then it will send the location of the patient which is shown in figure 9.
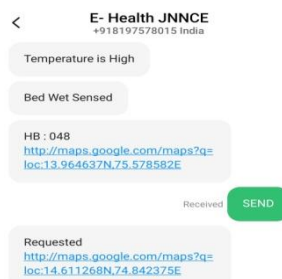

Fig. 9 Abnormal Condition Alarms.

Tracked location is as shown in figure 10. It shows a proper location of patient by that doctor will go for check up.
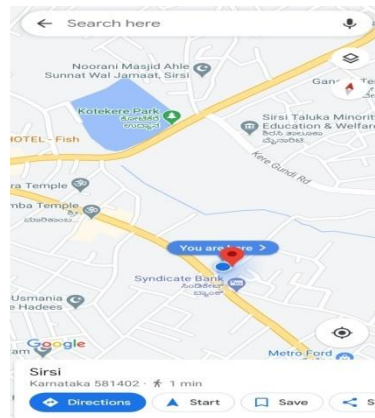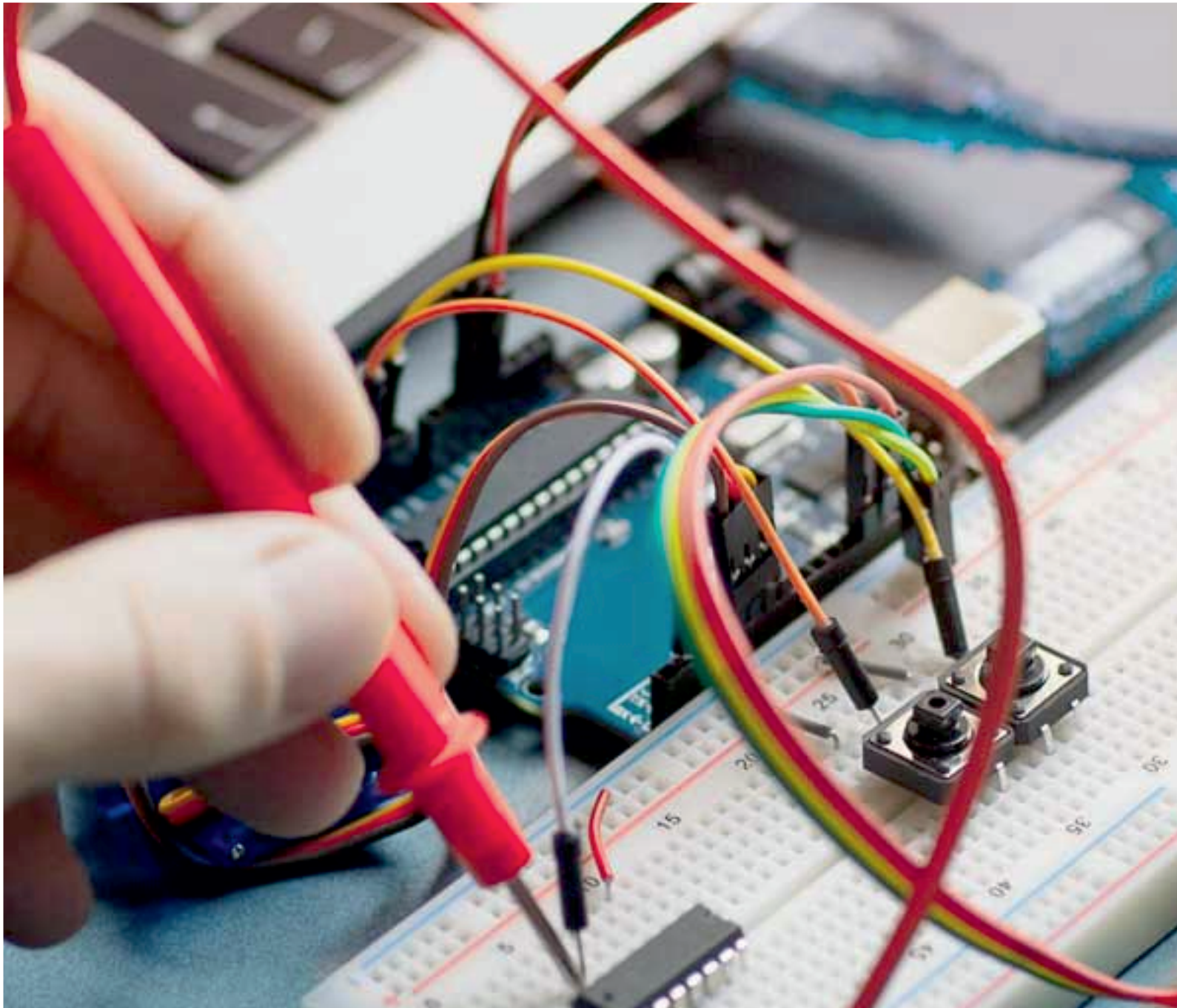

Fig .10 Tracked Location.

VI.CONCLUSION

In this project we have considered four different sensors to observe the patient's health. The device provides remote capabilities that improve the level of medical assist the patient receives while enabling them to be monitored continuously in the comfort of their home. This is specifically necessary for patients having periodic check up for different parameters. By using networking application, patients' health care information can be collected easily and efficiently, at the identical time providing access to them. Taking of this records as well as communication between patients and doctors, are taken as advantage. In this context the use of such utility for displaying reminders and notifications, is very important. Which significantly enhance the individualization and thereby the patients acceptance of electronic healthcare solutions for treatment and safeguard. And it has many functions like increase the potential to take advantage of very large information spaces for individuals and professionals. In the e-health system unfold and make use of hidden and identify the interrelations and dependencies between independently developed records below consideration of protection and privacy safety and epidemiological states and boost an adaptive, sustainable platform for electronic healthcare services increasing the web-based diagnosis quality for medical decision guide services.

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