



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 Issue: III Month of publication: March 2017

DOI: <http://doi.org/10.22214/ijraset.2017.3163>

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**International Journal for Research in Applied Science & Engineering
Technology (IJRASET)**

A GSM Based Embedded Mobile Web Server for Monitoring Aged People

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Abstract: Now a day's many real time applications are connected to web(internet). This is very useful and helpful for customers to see application(requirements) from anywhere in the world. These web connected applications belong to server client relation. TCP, UDP and HTTP protocols are used in this concept. Data transfer to web server is made through GSM (Global system for mobile) communication. Long data can be transferred through this GSM. Many Embedded Networking applications are coming under this model only. The main focus of the paper is to implement a prototype model for the real time elderly person's monitoring. The proposed system is used to measure the physical parameters like body temperature, heartbeat, humidity for monitoring the health of elderly people

KeyWords: Web, Protocols, GSM, Prototype model, Aged people, Physical parameters

I. INTRODUCTION

It is very complicated to monitor patient's health every hour. This proposed system is very helpful and useful for monitoring more number of people at a time. It is very low cost and effective. The system consists of a microcontroller, GSM/GPRS modem and analog, digital sensors. With the help of sensors microcontroller detects patient's health parameters like temperature, humidity, heart beatetc.,

8051 microcontroller is used in the proposed system along with analog and digital sensors to find patient's health condition. Serial (UART) protocol is primary concern here. The main heart of this project is GSM/GPRS modem and it work on GPRS AT commands. 16X2 LCD is connected to microcontroller through Digital I/O lines.

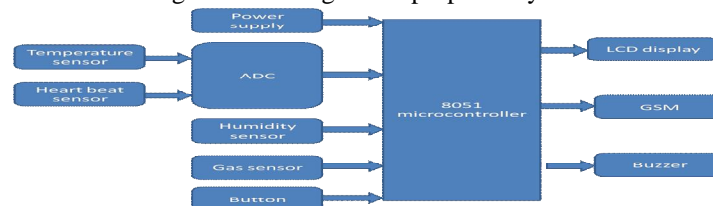
II. EARLIER METHODS

Several kinds of approaches for detecting the health of aged people automatically have been proposed by many. These are mainly classified into three categories: wearable sensor based, ambience device based and computer vision based methods. Wearable sensor based methods often use specialized equipments and sensors, such as accelerators and gyroscope sensors, which are attached to the human body. When a change occurs, it can be detected by the sensors and a help is automatically called for or be made manually via help buttons. One of the major problems with this is that wearable sensors are disturbing and often burdensome. Ambience device-based methods often take advantage of ambience sensors installed on the elders active regions such as vibration sensors on the floor and IR sensors or combine these sensors together to improve the performance.

However, some of these have a disadvantage of sensing signals of everything in and around the object by the ambience devices, which generates false alarms and leads to a low detection accuracy

III. PROPOSED METHOD

Fig 1. Block diagram of proposed system



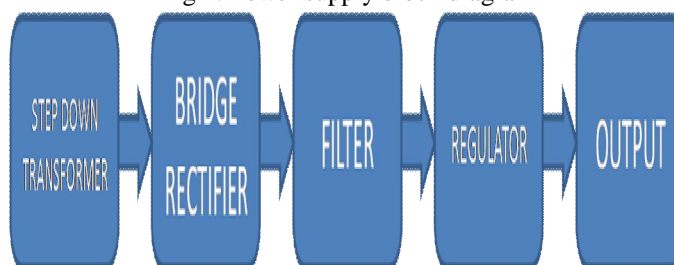
This proposed method deals with biomedical engineering. The aim of this project is to design a system that frequently monitors the conditions of patients and pass the information to the doctors by using GSM technology. The communication interface used in this

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system is GSM modem. By using serial interface it transports the device protocols through the network. A GSM modem is a wireless modem that works with GSM wireless technology. The GSM modem can receive any GSM network operator SIM card and it acts similar to the mobile phone which has its own unique number. The main advantage of this modem is it involves RS232 port to communicate and can be used in many embedded applications. The GSM modem is connected to microcontroller or the PC serial port directly. The parameters like temperature, heartbeat, humidity and gas are continuously monitored in this project by using analog sensors so that the doctor can diagnosis the patients continuously.

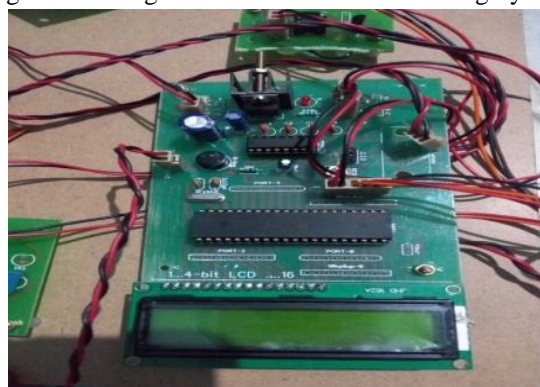
As shown in Fig 1., the system is designed in such a way that the analog quantities which are continuously recorded are converted to digital values by using 8 bit ADC. In this project 4 types of sensors have been used namely, the temperature sensor, heart beat sensor, humidity sensor and gas sensor. Here the microcontroller continuously receives the information from the sensors. The microcontroller receives the data from the ADC from where the data is processed. So that the doctor can continuously check the status of aged people by sending the predefined message to the controlling unit so that if any parameter exceeds its preset value, it is the duty of the controller to send the values of the parameter to be measured to the doctors mobile by using GSM modem so that the doctor can take immediate actions based on the parameters received from the system using GSM modem. To display the status of sensors a 16X2 LCD is interfaced. This project uses a regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Full wave bridge rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

Fig 2. Power supply block diagram



The main 5 blocks of power supply are step down transformer, bridge rectifier, filter, regulator and output as shown in fig 2. The 230 AC supply is converted to 12 volts AC supply using step down transformer. Next the bridge rectifier is used to convert the AC to pulsating DC. The filter then converts the pulsating DC to pure DC. The regulator is used in order to control the incoming voltage. The output block is used to display the output.

Fig 3. The designed and Fabricated Monitoring System



A. GSM Modem

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

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Fig 5a :-VIEW OF GSM MODEM



fig 5b:-DESIGNED AND FABRICATED GSM MODEM



1) A GSM modem can be an external device or a PC Card

B. A SIM Card Contains the Following Information

- 1) Subscriber telephone number (MSISDN)
- 2) International subscriber number (IMSI, International Mobile Subscriber Identity)
- 3) State of the SIM card
- 4) Service code (operator)
- 5) Authentication key
- 6) PIN (*Personal Identification Code*)
- 7) PUK (*Personal Unlock Code*)

Computers use AT commands to control modems. Both GSM modems and dial-up modems support a common set of standard AT commands. In addition to the standard AT commands, GSM modems support an extended set of AT commands. These extended AT commands are defined in the GSM standards. With the extended AT commands, the following operations can be performed:

Reading, writing and deleting SMS messages.

Sending SMS messages.

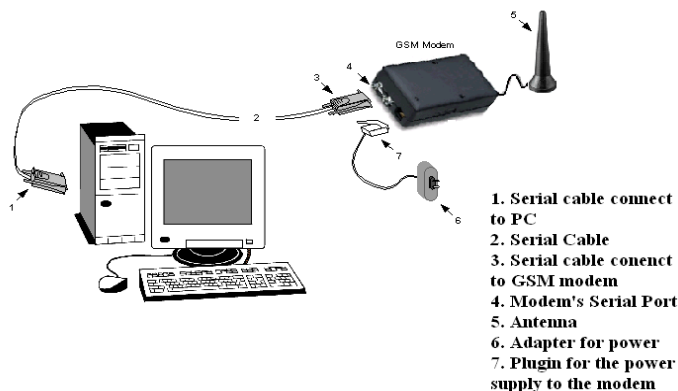
Monitoring the signal strength.

Monitoring the charging status and charge level of the battery.

Reading, writing and searching phone book entries.

Fig 6: Establishing Connection Between PC And GSM Modem

Establishing connection between PC and GSM modem



The number of SMS messages that can be processed by a GSM modem per minute is very low i.e., about 6 to 10 SMS messages per minute.

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Hardware Requirements

Micro controller : AT89S52

Crystal : 11.0592 mhz

Lcd : HD44780

GSM modem

MAX232

Temperature sensor

Isp

Software Requirements

Keil

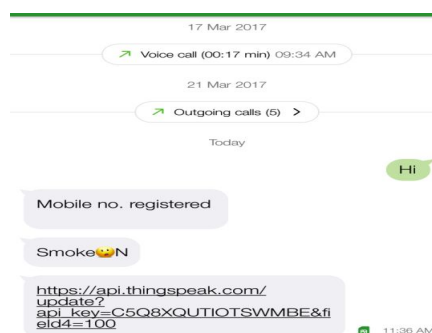
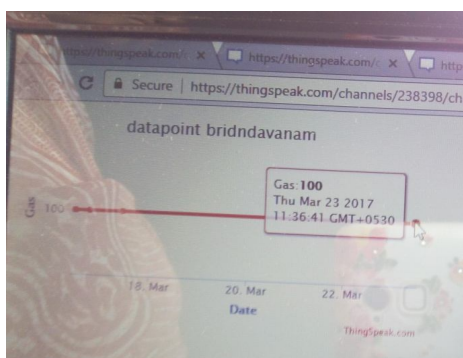
PROTEUS

UC Flash

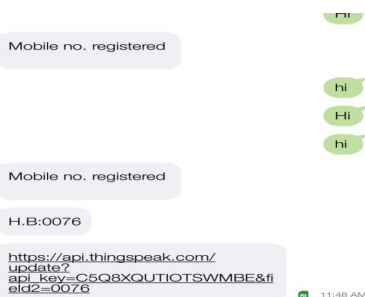
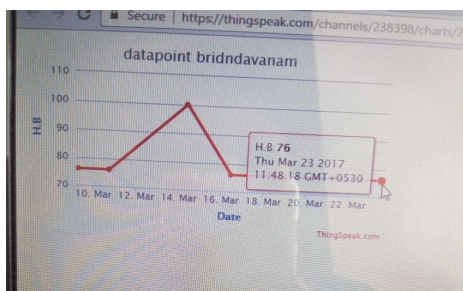
Embedded C Programming

IV. RESULTS

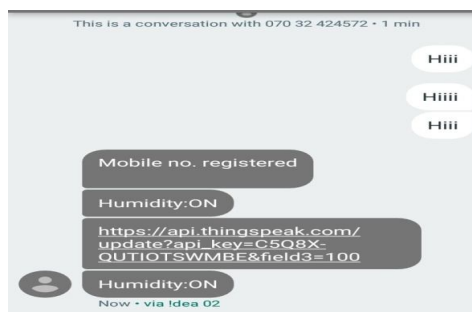
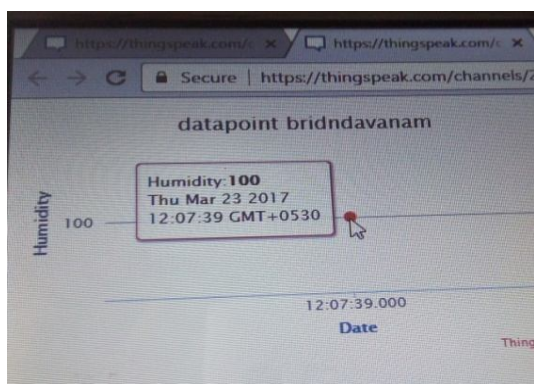
A. Result When Smoke is on



B. Result of Heartbeat



C. Result When Humidity is on



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V. CONCLUSIONS

The proposed system has been successfully designed, fabricated and tested with integrated features of each hardware component for its development. Significance of each block has been resonated out and placed carefully, thus contributing to the best working of the unit. Hence the system is reliable with simple and easily available components making it lightweight and portable.

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