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HEALTH MONITORING AND CONTROLLING SYSTEM THROUGH MOBILE COMMUNICATION

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ABSTRACT:The main aim of our project is to cure the patient conditions without physical presence of doctor through mobile communication. In this project Bio- system parameters namely pressure, glucose and heart beat is measured. These measured parameters will be displayed. Abnormality in the pressure, glucose and heart beat will be send information to Doctor through mobile in case he is out of hospital, as well as the status of the patient will be announce. Bio technique is that biomedical signal transfer a wireless link between the patient and the physician. By using a miniature transmitter attached to the patient to inform over a range. The physician study and resets the subject with his full mobility. This technique provides the best method of isolating the patient from the recording equipment. Pressure, glucose and heart beat is sensed by the transducer and it gives current outputs directly proportional to absolute pressure, glucose and heart beat variations. This is amplified using Instrumentation amplifiers and feed to micro controller unit. The mentioned sensing circuits are connected to PIC through interface card. PIC µC will be continuously receiving these signals through sensor circuits and further does the work of displaying and inform to doctor through mobile technology. The doctor gives command through embedded interfacing unit to solve the abnormality.

KEYWORDS: PIC µC, sensors, Miniature Transmitter, Instrumentation Amplifiers.

I.INTRODUCTION

The usage of web technologies is increasingly growing in developing countries like India. This work embodies the development of simple and robust technique for preliminary detection of diseases in the rural population of resource poor countries like India without presence of medical practitioner. We have developed web based application, that can be used to assist and connect health workers and trained medical professionals by using server. Rural areas often have fewer doctors and certain specialists might not be available at all. This work aims to improve the health care facilities in the rural areas. It also aims at providing interactive information and communication exchange between the health care officials and the rural population via android applications.This system is used to solve the abnormality immediately which helps to take the decision at the instant. The system is implemented with the support of embedded processor and the simulation is achieved proteus 8.1 version software through MP lab IDE.

II. METHODS

A. System Architecture

Service oriented system architecture, the software design and implementation of each component including the sensors used in the system. Our proposed system in system architecture is to measure three parameters includes blood pressure, blood glucose level and heartbeat, and then it will transfer the test results to the medical practitioner. The transducers picks the bioelectrical potentials are converts the another type of electrical signals. These signals are goes through the signal conditioner which records the electrical activity. The PIC µC will store the test results and then connected with the level translator. The level translator provides an interface between a processor and a system. By using web technology is to relate the Physician and the patient. The patient's doctor will get notification to look at the test results and give the command to controlling unit. And then fill with the required quantity of the medicine liquid in the saline. And immediately give the medicine from the helping assistant. During emergency it keeps check the patient condition becomes normal

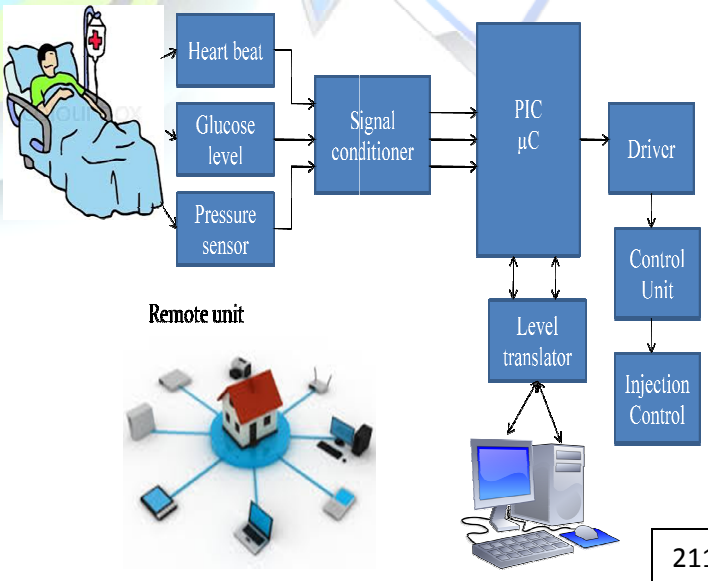

Fig1.System Architecture

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B. Hardware

[1] Microcontroller Interfacing Unit (PIC16F877A)It is high performance RISC CPU. It is full duplex processor so that serial communication is possible. As we have separate lines for receiving and sending, it is possible to receive and send data (info.) at the same time. So called full-duplex mode block which enables this way of communication is called a serial communication block. Unlike the parallel transmission, data moves here bit by bit, or in a series of bits what defines the term serial communication comes from. After the reception of data we need to read it from the receiving location and store it in memory as opposed to sending where the process is reversed. In order for this to work, we need to set the rules of exchange of data. These rules are called protocol. Data goes from memory through the bus to the sending location, and then to the receiving unit according to the protocol.

LCD INTERFACING

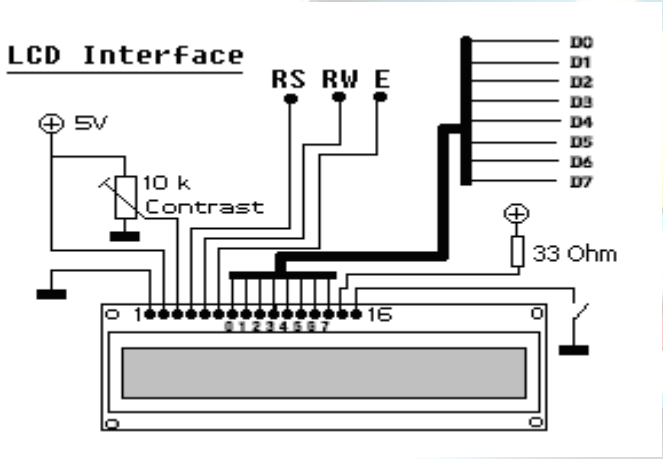

Fig 2. LCD Interfacing unit

A liquid crystal display (LCD) is an electro-optical amplitude modulator realized as a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. It is often utilized in battery-powered electronic devices because it uses very small amounts of electric power.

Interfacing an LCD to PIC Microcontroller

LCD Operation:

In recent years the LCD is finding widespread use replacing LEDs (seven-segment LEDs or other multisegment LEDs). This is due to the following reasons:

- The declining prices of LCDs.
- The ability to display numbers, characters, and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
- Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU (or in some other way) to keep displaying the data.
- Ease of programming for characters and graphics.

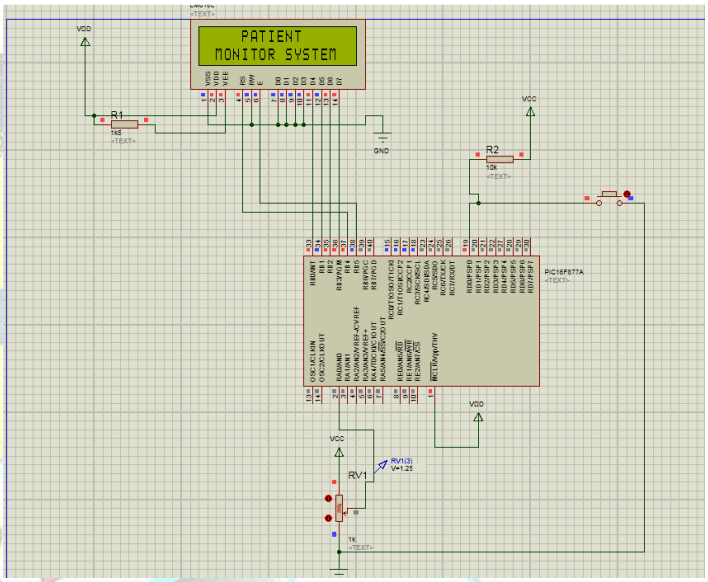

Fig 3.LCD Interfacing in Proteus

C. Software

In software architecture we have developed in embedded side measuring technique by using proteus 8.1 version.

Click on Proteus ISIS and it will be appear as shown in image below. Right click the image and open in new tab to get a better look of the image. In the central area, we design our circuit i.e. place the components and then join them.

First icon on the toolbar is to create a new layout, second is to open an existing layout, next one is to save your layout, then there comes few zooming options and also some tools which we will further discuss in next tutorials and at the end of section 1, you can see ARES icon and we will also see its use when we will design the PCB layout.

Let's come to section 2, it has two buttons on it, one is P and other is E. P changes with the selection change of section 3 mostly it is used for opening the part list i.e component list and E

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is used for editing purposes, like you want to edit the properties of any component then simply click on that component and then click on E and it will open the properties of that component and you can easily edit it.

Section 3 is most commonly used section of proteus. It has a lot of functions on it. We will check them today one by one in complete detail.

Now finally the section 4, this section shows different buttons like play, stop etc. When you design some circuit in Proteus, then you want to run it in order to check whether it's working or not. So in order to run the circuit, you have to click on this play button. So when you click on play button the circuit starts to run, now click on Pause button and it will pause and Stop to stop the circuit running.

Circuit designing in Proteus

- First of all, open the Proteus ISIS software.
- In the start, it will look exactly the same as in below image.
- Now click on button P as shown in figure.
- When you click this button a new window will pop up as shown in below figure.
- This is the place where we search our components, like as I want 7805 so I searched for this component and the Proteus has given me the related components.
- Once you get your desired component, simply double click on it and it will be added in your database so that you can use them.
- The below image shows the components which we are gonna use in this project, so simply search for all the components and then double click on them and finally you will get all the components as shown below:
- Now place these components in the Proteus workspace and connect them.
- Design exactly the same circuit as shown in the below figure:
- Now our circuit in Proteus is ready to use, the next step is to write a code for the PIC Microcontroller 16F877A and then burn it into the Proteus and check its working.

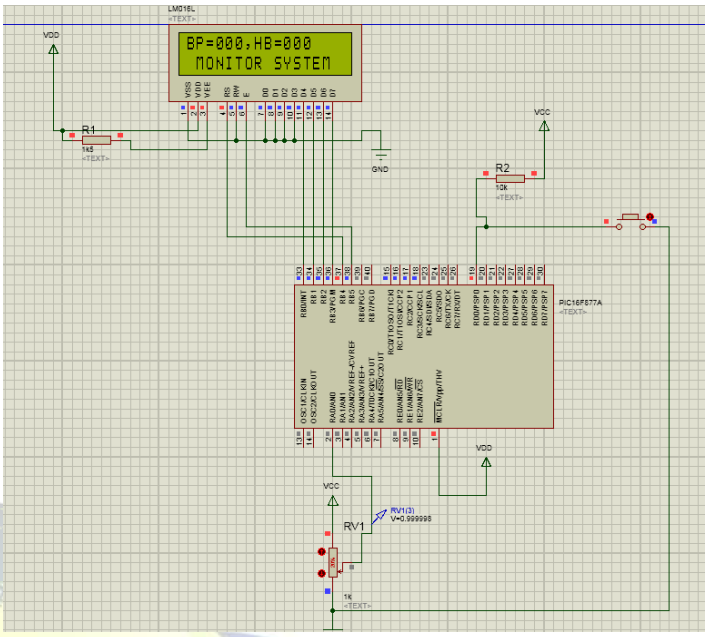

Fig 4. Initial Stage

III. ANALYSIS FOR THE CASE STUDY

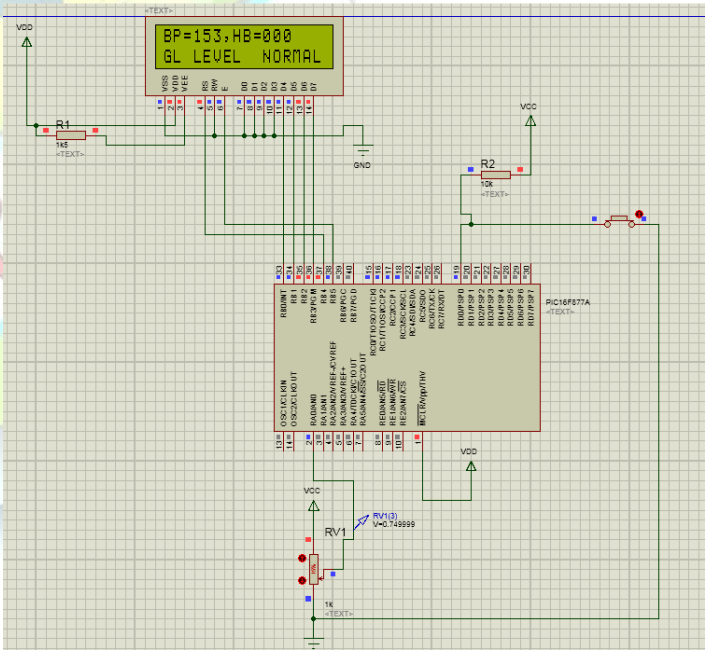

Fig 5. BP Reference

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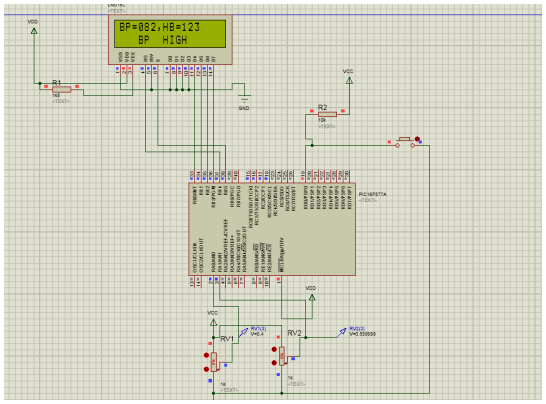

Fig 6. BP Variable

The preferred subjects for this study were aged people who were able to perform the physiological measurement protocols. Here we preferred parameters are blood pressure, blood sugar and Heart beat measurement.

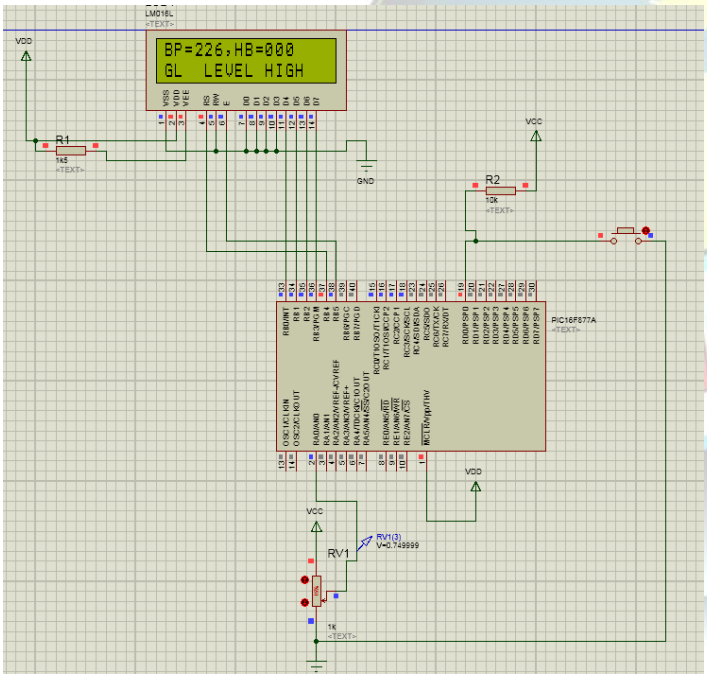

Fig 7. BP & GL Record

The major purpose of the case study is to validate the whole system and to make sure it is simple enough for the end, especially for the ICU patient monitoring purpose. In the study, we let the whole system run continuously collecting the heart rate, Blood pressure and Blood glucose level. The system works properly without throwing any exceptions. After the sampling data is collected into the database in LCD display, we set the reference point of Blood pressure and heart beat. And checks with the patient condition whether high or low range with the reference value. According with that data it will show to the helping assistance. From this experiment, we find that the whole system is robust. Then everything is done with GSM technology.

IV. CONCLUSION

Thus by using the three sensors this project electronic intensive patient care unit monitors the patient's pressure, heart beat and blood glucose. This unit provides a constant monitoring of patients in critical conditions and is useful to the doctors and nurses who need not be at the patient's bedside constantly. This is a lifesaving bio medical equipment. Now I have implemented the monitoring side software simulation using Proteus software.

REFERENCES

1. C. T. Chittenden and C. S. Weaver (1988), "Blood pressure measurement artifact rejection in noisy environments," presented at the 10th Annual International Conference of The IEEE Engineering In Medicine and Biology Society, 1988

2. D. K. Jung, K. N. Kim, G. R. Kim, D. H. Shim, M. H. Kim, B. C. Choi, and D. J. Suh (2005) , "Biosignal monitoring system for mobile telemedicine," *Proceedings of 7th International Workshop on Enterprise networking and Computing in Healthcare Industry,* pp.31-36,2005.

3. D. Lucani, G. Cataldo, J. Cruz, G. Villegas, and S. Wong (2006), "A portable ECG monitoring device with bluetooth and holter capabilities for telemedicine applications," *Proceedings of the 28th IEEE EMBS Annual International Conference,* pp. 5244-5247, 2006

4. E. S. Berner, R. K. Kasiraman, F. Yu, M. N. Ray, and T. K. Houston (2005), "Data quality in the outpatient setting: impact on clinical decision support systems," in AMIA AnnuSympProc, 2005, pp. 41-45.

5. G. D. Clifford, W. J. Long, G. B. Moody, and P. Szolovits (2009), "Robust parameter extraction for decision support using multimodal intensive care data," Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, vol. 367, pp. 411- 429, 2009

6. J. Abdul Sukor, S. J. Redmond, G. S. H. Chan, and N. H. Lovell (2012), "Signal quality measures for unsupervised blood pressure measurement," Physiological Measurement, vol. 33, pp. 465-486, 2012

7. M.F.A. Abdul and B. Woodward (2005),"Bluetooth Telemedicine Processor for Multichannel Biomedical Signal Transmission via Mobile Cellular Networks," *IEEE Transaction on Information Technology in Biomedicine,* Vol. 9,pp. 35-43, 2005

8. S. Charbonnier, J. P. Siche, and R. Vancura (2000),"On line detection of movement artifacts to improve ambulatory blood pressure monitoring," in *17th IEEE Instrumentation and Measurement Technology Conference*, 2000, pp. 693-697.

9. S.H. Toh, K.H. Do, W.Y. Chung, and S.C. Lee (2009), "Health Decision Support for Biomedical Signals Monitoring System Over a WSN," *Second international Symposium on Electronic commerce and Security,*pp. 605-608,2009.

10. X. Kong and R. Feng, (2001), "Watermarking medical signals for telemedicine," *IEEE Transaction on Information technology in biomedicine,* vol. 5, pp. 195-201, 2001.