

## IOT BASED SALINE LEVEL MONITORING SYSTEM

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**Abstract:** a failure of a person, inattentiveness and a greater number of patients, the saline is totally consumed. Initially, this might be inferred as an event. But the consequences are harmful. Just after the saline finishes, blood rushes back to the saline bottle due to difference in blood pressure and pressure in the empty bottle. Thus, Unique health monitoring systems have being developed with less human interference which will be available at low cost in rural as well as urban areas. The system objective is to trouble-shoot the above-mentioned problem efficiently. By means of this the nurse can monitor the amount of saline even in the control room. An automatic saline level monitoring consists of Level sensors which recognize the status of liquid in the bottle whether it is normal or warning status. The recognition of saline drop rate is quite accurate. The output obtained from the sensor is processed to check whether the saline bottle is empty. When the saline bottle goes below a threshold level, the alarm sound will be produced. So, the system reduces continuous monitoring of the patient by nurses.

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**Key Word:** Saline level, IR sensor, NodeMCU etc.

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## I. Introduction

Due to increase in the population, there is a need for improvement in health care. As the saline bottle goes below the threshold level, it is necessary to change the saline bottle. So new idea called IOT based Saline Level Monitoring System is emerged. The main objective of system is to provide authentic, accessible, easy and economic system for saline level monitoring. The saline is inserted into blood by considering certain characteristics like heart rate, blood pressure, body temperature, pulse rate and body weight of patient. As the saline bottle goes below the threshold level, it is necessary to change the saline bottle. An automatic saline level monitoring consists of IR sensors which are used to determine the status of liquid in the bottle whether it is normal or warning status. The notification can be sent to the nurse on her mobile. So, nurses do not need to go to patient's bed every time because they can check saline drop let status of each patient via this system. This system is a low-cost system and comfortable for a nurses. Therefore, in rural public hospital can use this system in common patient's room.

## **II. Literature Survey**

1. “Mansi G. Chidgopkar, Aruna P. Phatale” Automatic And Low Cost Saline Level Monitoring System Using Wireless Bluetooth Module And Cc2500 Transceiver “International Journal of Research in Engineering and Technology; Volume:04 Issue: 09 —September-2015”

Traditional methods used for health care are becoming obsolete due to increase in population. Current health care system requires manual care takers and their continuous monitoring duties which is very time-consuming job. *Unique* health monitoring systems are required with less human interference which will be available at low cost in rural as well as urban areas. Engineering technologies are getting combined with medical field to overcome this problem. So health monitoring systems are getting developed with the help of electronic components such as sensors, PLC, microcontrollers etc. with easy interfacing. This paper mainly focuses on providing advanced saline level monitoring system.

2. “C.C. Gavimath, Krishnamurthy Bhat, C. L. Chayalakshmi, R. S. Hooli and B. E. Ravishankera” Design And Development Of Versatile Saline Flow Rate Measuring System And GSM Based Remote Monitoring Device” International Journal of Pharmaceutical Applications Vol 3, Issue 1, 2012.”

As the world population grows, the need for health care increases. In early years, improvements in medical care has been rapid due to the advancements in the field of sensors, microcontrollers and computers. A major reason for this is the fusion of the two important disciplines namely medical and engineering. This paper describes the development of an automatic saline monitoring system using a low cost indigenously developed sensor and GSM (Global system for mobile communication) modem. This enables the doctor or nurse on duty to monitor the saline flow rate from a distance. The 8051 microcontroller is used for providing co-ordination action. An IR sensor is used at the neck of the saline bottle to know the flow rate of the liquid. The detection of saline drop rate is quite faithful. The output obtained from the sensor is processed to check whether the flow rate is slow, medium or fast and the same is transmitted through GSM technology to a distant mobile cell for future actions.

3. “Pattarakamon Rangsee, Paweena Suebsombut, Phakphoom Boonyanant” Low-Cost Saline Droplet Measurement System using for Common Patient in Rural Public Hospital. “The 4th Joint International Conference on Information and Communication Technology, Electronic and Electrical Engineering (JICTEE) 978-1-4799-3855-1/14 2014”

The system can be used to check saline droplet of patients in each patient’s bed in rural public hospital. By installing the measuring modules in all patients’ beds, the system will show saline droplet status of each patient. So, nurses can accurately check saline droplet status of their patients on a computer including saline droplet statuses, saline droplet rate (drops per minute), and remaining time. The saline droplet statuses include four statuses that are Normal status (the system is working, the green light is shown on monitor), Warning status (sensor at critical point cannot detect saline, the yellow light is shown on monitor), Error status (droplet sensor cannot detect saline droplet, the red light is shown on monitor), and Chang New Bag (the blue light is shown on monitor). So, nurses do not need to go to patient’s bed every time because they can check saline drop let status of each patient via this system. This system is a low-cost system and convinient for a nurses. Therefore, in rural public hospital can use this system in common patient’s room.

4. “P. Kalaivani, T. Thamaraiselvi, P. Sindhuja and G. Vegha” Saline Level Monitoring System Using Arduino UNO Processor “Asian Journal of Applied Science and Technology (AJAST) Volume 1, March 2017.”

The epidemic growth of wireless technology and mobile services in this epoch is creating a great impact on our life style. Some recent efforts have been taken to utilize these technologies in medical industry. In this field, ECG sensor

based advanced wireless patient monitoring system concept is a new unique idea. The saline level is indicated by LCD. The major output ECG analog signal is displayed on serial plotter. The outputs are displayed through mobile application.

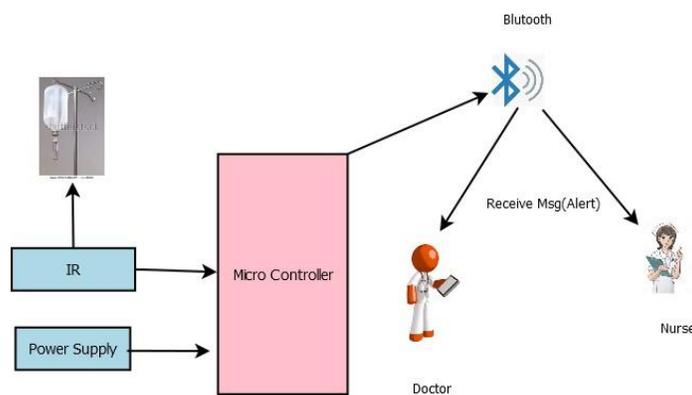
5. “Priyadharshini R, Mithuna S, Vasanth Kumar U, Kalpana Devi S, Dr. Suthanthira Vanitha N.” Automatic Intravenous Fluid Level Indication System for Hospitals “International Journal for Research in Applied Science & Engineering Technology; Volume 3 Issue VIII, August 2015.”

During last some years due to the technological growth in many sophisticated techniques has been evolved for assuring fast recovery of the patients in hospitals. For good patient care in hospitals, assessment and management of patient’s fluid and electrolyte need is the most fundamental thing required. Most in all hospital, an assist/nurse is responsible for monitoring the fluid level continuously. But unluckily, during most of the time, the observer may forget to change the saline bottle at correct time due to their busy schedule. This may lead to several problems to the patients such as backflow of blood, blood loss etc.

### III. Methodology

Initially, this might be inferred as an event. But the consequences are harmful. Just after the saline finishes, blood rushes back to the saline bottle due to difference in blood pressure and pressure in the empty bottle. Thus, Unique health monitoring systems have being developed with less human interference which will be available at low cost in rural as well as urban areas. The system objective is to trouble-shoot the above-mentioned problem efficiently. By means of this the nurse can monitor the amount of saline even from the control room. An automatic saline level monitoring consists of Level sensors which are used to determine the status of liquid in the bottle whether it is normal or warning status. The detection of saline drop rate is quite faithful. The output obtained from the sensor is processed to check whether the saline bottle is empty. When the level of saline goes below a threshold level, the alarm sound will be produced.

**Figure.No.1.** Saline Level Monitoring System.



The main objective of system is to provide authentic, accessible, easy and economic system for saline level monitoring. The saline is inserted into blood by considering certain characteristics like heart rate, blood pressure, body temperature, pulse rate and body weight of patient. As the saline goes below the threshold level, it is necessary to change the saline bottle. An automatic saline level monitoring consists of IR sensors which are used to determine the status of liquid in

the bottle whether it is normal or warning status. The notification can be sent to the nurse on her mobile. This system which can automatically monitor the saline flow rate by using microcontroller. It can wirelessly send the data to nurses or doctors' computer and display the results in the form of saline droplet rate, number of droplets coming from saline bottle, saline solution given to the patient in ml and remaining time to empty the saline bottle with the help of serial port test software.

**The step-by-step procedure:**

1. Level Sensor will continuously check the level of saline liquid whether it is above or at or below threshold level.
2. If the level of saline liquid is at or below threshold point, Alarm will be generated.
3. Immediately notifications will be sent to the nurse or doctor that there is a need for replace the saline bottle.
4. If in case, concerned patient is not been acknowledged by the nurse or doctor, buzzer will get activate.

**IV. Results**

**Figure No.2:** Admin Login Page

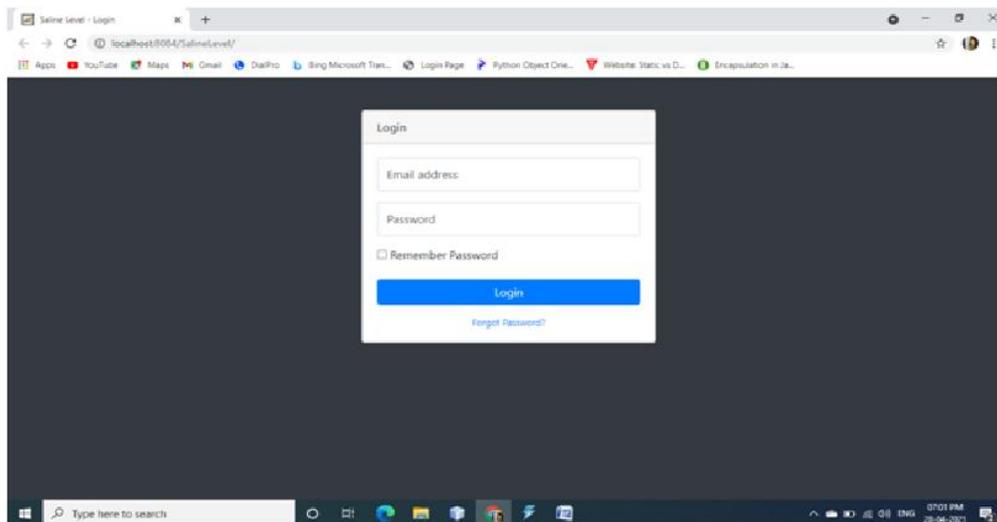


Image No.1 shows the Admin Login Page. It stores the database of Doctor and Nurse with their names, registered email address and password.

Figure No.3: Admin Home Page

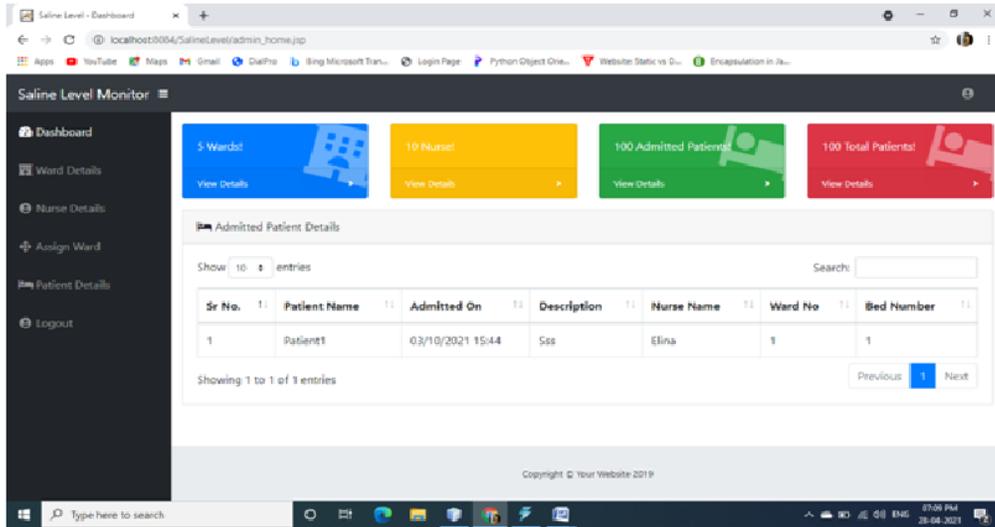


Image No.2 shows Admin Home Page. It stores the database of patients such as the name, bed number, ward number of the patient. As soon as any electrolyte bottle whose record is maintained in the database reaches the threshold level, its alert is displayed at the display screen.

Figure No 4: Nurse Details

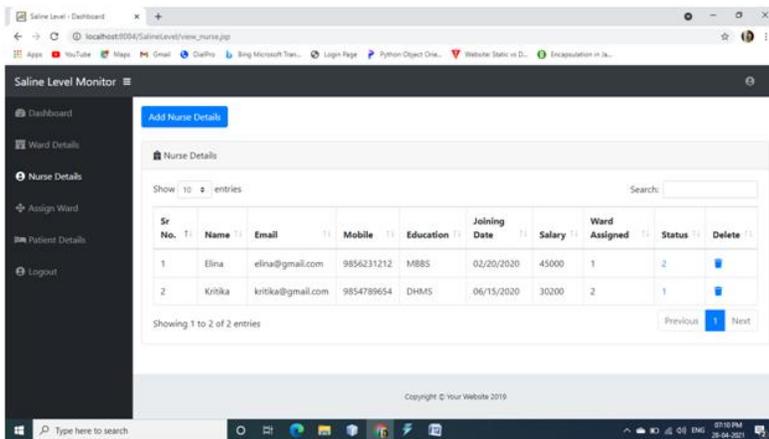


Image No.3 shows the Nurse Details Page. It stores the database of nurse like the ward they are assigned to and other information.

## **V. Conclusion**

This system which can automatically monitor the saline flow rate by using microcontroller. It can wirelessly send the data to nurses or doctors' computer and display the results in the form of saline droplet rate, number of droplets coming from saline bottle, saline solution given to the patient in ml and remaining time to empty the saline bottle with the help of serial port test software. The system is loyal, remunerative and comfortable for nurses. It can be reused for the next saline bottle. It is beneficial for nurses as well as doctors at rural hospitals. Nurses can easily monitor the saline level from distance. It is mainly advantageous at night timing as there is no need for nurses to go to patients' bed to check the level of saline in the bottle.

## **References**

- [1]. Mansi G. Chidgopkar, Aruna P. Phatale "AUTOMATIC AND LOW COST SALINE LEVEL MONITORING SYSTEM USING WIRELESS BLUETOOTH MODULE AND CC2500 TRANSRECEIVER" International Journal of Research in Engineering and Technology ; Volume:04 Issue: 09 —September- 2015
- [2]. C.C. Gavimath, Krishnamurthy Bhat, C. L. Chayalakshmi, R. S. Hooli and B. E. Ravishankera "DESIGN AND DEVELOPMENT OF VERSATILE SALINE FLOW RATE MEASURING SYSTEM AND GSM BASED REMOTE MON-ITORING DEVICE " International Journal of Pharmaceutical Applications Vol 3, Issue 1, 2012.
- [3]. Pattarakamon Rangsee, Paweena Suebsombut, Phakphoom Boonyanant "Low-Cost Saline Droplet Measurement System using for Common Patient oom in Rural Public Hospital" The 4th Joint International Conference on Information and Communication Technology, Electronic and Electrical Engineering (JICTEE) 978-1-4799-3855-1/14 2014.
- [4]. P.Kalaivani, T. Thamaraiselvi, P. Sindhuja and G. Vegha "Saline Level Monitoring System Using Arduino UNO Processor" Asian Journal of Applied Science and Technology (AJAST) Volume 1, March 2017.
- [5]. Priyadarshini R, Mithuna S, Vasanth Kumar U, Kalpana Devi S, Dr. Suthanthira Vanitha N. "Automatic Intravenous Fluid Level Indication System for Hospitals" International Journal for Research in Applied Science & Engineering Technology; Volume 3 Issue VIII, August 2015.
- [6]. K. Navya1, Dr. M. B. R. Murthy "A Zigbee Based Patient Health Monitoring System" Vol. 3, Issue 5, Sep-Oct 2013, pp.483-486.
- [7]. Nikita Patni, Kavita Sakhardande, Joanne Gomes "Web Based Remote Patient Monitoring System with Integrated GSM" International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 4, Issue 4, April 2015.
- [8]. Shyama Yadav, Preet Jain Electronics "Real time cost effective e-saline monitoring and control system " International Conference on Control, Computing, Communication and Materials (ICCCCM) 978-1-4673-9084-2/210.