REMOTE MONITORING THE GLUCOSE BOTTLE LEVEL IN HOSPITALS

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Abstract:

During recent years, due to the technological advancements many sophisticated techniques has been evolved for assuring fast recovery of the patients in hospitals.Need for good patient care in hospitals, assessment and management of fluid and electrolyte is the most fundamental thing required. All most in all hospital, an assist/nurse is responsible for monitoring the Glucose bottle level. But unfortunately most of the time, the observer may forget to change the saline bottle at correct time due to their busy schedule.To overcome this critical situation, a GSM based automatic alerting and indicating device is proposed where weight sensor is used as a level sensor. It is based on the principle that the IR sensor output voltage level changes when intravenous fluid level is below certain limit. A comparator is used to continuously compare the message output with predefined threshold. When the transceiver output is negative then the Arduino controller identifies the fluid level is too low and it alerts the observer through the mounted LCD display and mobile phone at the control room indicates the room number of the patient for quick recovery.

Keywords:

Glucose bottle, load cell, weight sensor, Arduino Controller ,GSM modem , LCD

I. Introduction:

Generally, as the population growth increases, the need for health care also increases. Hence it is a mandatory thing for everyone in this world to take care of their health properly. In this scenario, maintaining patient's safety is the top most priority to be given in all hospitals. Now days, many automatic health monitoring devices are developed to ensure patients safety and to reduce the stress of the doctors. The invention of such devices introduces a drastic change in medical field for monitoring the parameters like heart beat rate, detection of heart attack symptoms and much more automatically with interdisciplinary nature. Even though many advanced automatic devices are used, ensuring the safety of the patients during IV period is still a challenging issue. To notify the hospital staff about the level of glucose in a glucose bottle, that is being injected through the patient's vein (IV therapy).This automation eliminates the manual need to monitor the level of glucose in the bottle. The load cell amplifier attached with the load cell helps in finding the weight of the glucose bottle. By using the weight, the level of liquid present in the bottle can be calculated so that when the liquid reaches its minimum level, GSM modem is used to send alerts to mobile phones.The first intimation, an SMS alert is sent when there is 50 ml of liquid present. The second intimation, a call alert is sent when there is 30 ml of liquid left.

II. Literature Survey:

2.1. AUTOMATIC INTRAVENOUS FLUID LEVEL INDICATOR SYSTEM FOR HOSPITALS

Therapies administered intravenously are often called specialty pharmaceuticals or drips. Even though monitoring the IV fluid level of patient is a small thing for a nurse but it will affect the patient health severely during illness if the assist does not monitor it regularly. This may leads to blood loss or backflow of blood to IV tube from their vein. This results in the reduction of hemoglobin level of patients and it may also make the person anemic. The task of assessing and managing the patients with sufficient skill needs to be a fundamental thing for a good patient care. Hence to assure the safety of the patient during IV period there is a need to develop an efficient health monitoring system. This can be achieved with the proposed idea of RF based IV fluid level indicating system where IR sensor, RF transmitter, receiver and buzzer are used to provide intimation to control room either to change the intravenous set or to switch it off. This will reduces the stress in continual monitoring by the doctor or nurse at an affordable cost.

2.2. A NEW WIRELESS SENSOR FOR INTRAVENOUS DRIPPING DETECTION

The sensor network we are proposing has been developed focusing on the application, the detection of the intravenous dripping, for which the cost and the energy consumption have been optimized. This sensor network is formed by different wireless devices, which are placed in the drip chamber of the patients, and by a central device located in every room of the sanitary center. The wireless device consists of four modules: the sensor module, the radio module, the feeding module and the microprocessor. It is possible to emphasize that this article includes the study of the dripping detection techniques, as well as the development and implementation of the sensor and the base station. In this moment, the project is focused on the implementation of the location and routing algorithms of the sensor network.

III. Existing System:

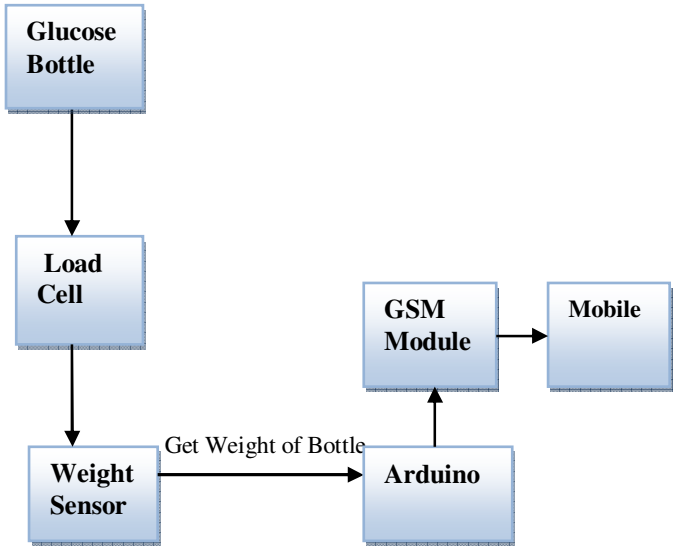
The alarm signal can disturb the patient. It requires the caretaker of the patient to request the hospital staff to replace the bottle. Absence of intimation may cause major issue for the patient

IV. Proposed System:

This system eliminates the constant manual monitoring of the level of liquid in a bottle.The first intimation is given when 50 ml of liquid is left so that the hospital staff gets enough time to reach the room and replace the bottle.The second intimation is sent in the form of a call alert to indicate the urgent need to replace the bottle .

V. System Architecture:

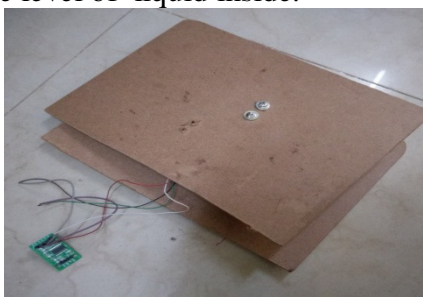
In the system,by using the weight, the level of liquid present in the bottle can be calculated so that when the liquid reaches its minimum level, GSM modem is used to send alerts to mobile phones



VI. Modules Description:

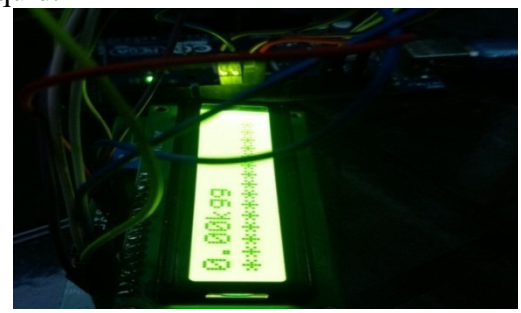
6.1 Sensing weight using load cell

The weight of the bottle can be calculated with the help of a load cell and a load cell amplifier, which is used to predict the level of liquid inside.



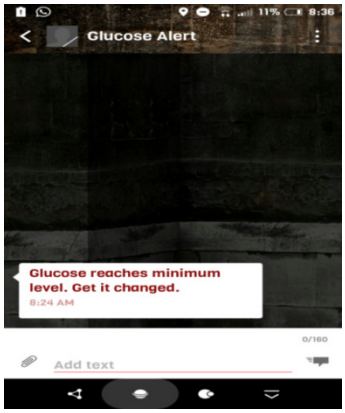
6.2 Displaying weight in LCD

The weight of the glucose bottle as predicted by the load cell is displayed in an LCD so that it is easy to monitor the level of liquid.



6.3. Sending SMS alert via GSM

The first intimation which is an sms alert is sent through a GSM modem, when the level of liquid is 50 ml, which gives enough time for the hospital staff to reach the room and replace the bottle.



6.4. Sending Call Alert via GSM

The second intimation which is a call alert, is sent through a GSM modem, when the level of liquid is 30 ml. In case if the first intimation is missed, this call will alert the hospital staff about the urgent need to replace the bottle.

VII. Output & Result:

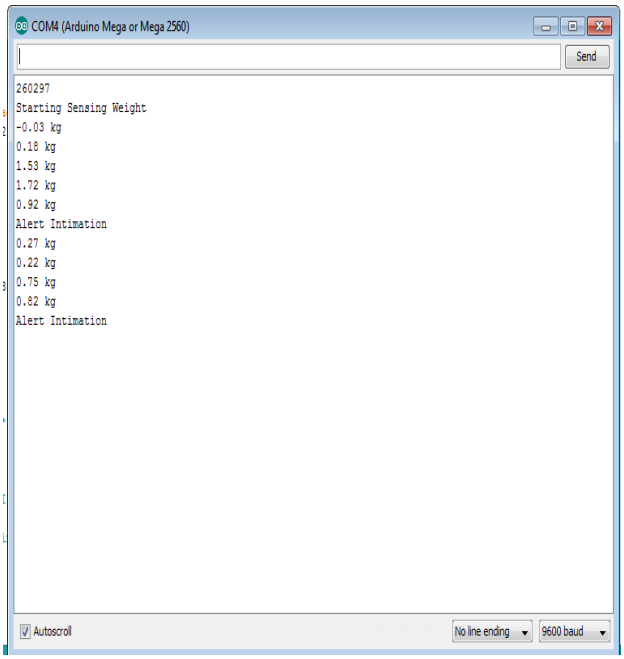


Fig7.1: OUTPUT ON SERIAL MONITOR

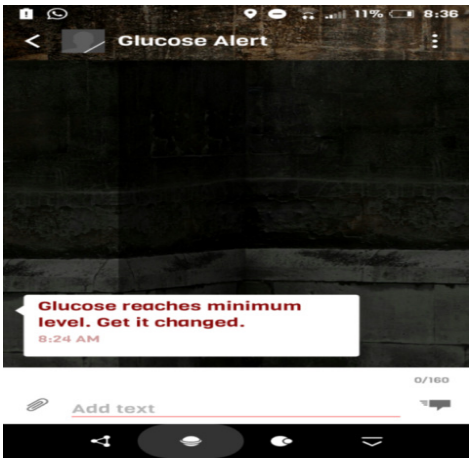


Fig7.2: SMS ALERT RECEIVED

VII. Conclusion:

By sending glucose bottle alerts to hospital staff, the constant need to manually monitor the level of glucose is avoided. This is of high advantage to the patients especially during night times. This system also avoids the fatal risk of air bubbles entering the patient's bloodstream, which is a serious threat as air bubbles in blood can cause immediate death.

VIII. Future Enhancement:

In future the system can be extended to a distributed wireless network system. Furthermore, with the development of embedded hardware, more complex embedded coding and we send the security alert to the 3G mobile so only the sending and receiving speed is high, this can be used to give more kinds of applications in the future.

IX. References:

[1] R.Vasuki, C.Dennis, HemPriya Changer, "An portable monitoring device of measuring drips rate by using an Intravenous (IV) set", International Journal of Biotechnology Trends and Technology Vol. 1, Issue 3, No.4 2011.

[2] C.C.Gavimath, Krishnamurthy Bhat, C.C.Chayalakshmi, R.S.Hooli, B.E.Ravishankera "Design and Development of versatile saline flow rate measuring system and GSM based remote monitoring device", International Journal Of Pharmaceutical Applications ISSN 0976-2639.

[3] R.Aravind, Syed Mustak Ahmed "Design of family health monitoring system using wireless communication", International Journal of Advanced Research in Computer and Communication Engineering Vol. 2, Issue 9, September 2013