

SALINE MONITORING SYSTEM

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***Abstract* - In the process of medication, it is a common practice to treat patients with saline for dehydration and other medical ailments to improve the health condition of the patients. When fed with saline continuous observation of nurses is mandatory in monitoring the level of the saline. There are many cases where patients are being harmed due to the staff inattentiveness, as their absence does not notice the completion of saline level in the container. This raises the problem of back flow of blood immediately after the completion of saline in the container. Hence to protect the patient from getting harmed, an IoT based saline level monitoring system has been developed. The proposed model incorporates a sensor which continuously detects the saline drops and three minutes prior to the saline content getting empty an alert is sent to the nurse or doctor.**

I. INTRODUCTION

Arduino microcontroller is a programmable circuit board; unlike other

circuit boards the Arduino does not require separate hardware to upload a code and plays a significant role in developing monitoring systems. In hospitals in the process of medication to patients, when the patients are fed with saline they must be constantly monitored. More often in the busy continuous schedule of the staff attending the large set of patients, the nurse may forget to monitor and change the saline bottle as soon as its completion. Thus, the blood rushes back to the saline bottle through the intravenous tube because of the imbalance created between the blood pressure and pressure within the empty saline bottle. This may cause the backflow of blood from their veins through cannula resulting in the reduction of patient haemoglobin levels and shortage of red blood cells (RBC's).

Patients most frequently face this problem in the hospitals. This may even lead to a patient's death. So, to overcome this

problem there is a necessity to develop a saline level monitoring system which reduces the dependency of patients on nurses. In this system, whenever the saline in the bottle completes, automatically the tube is compressed and additionally it also gives a buzzer alerting the staff about the completion of saline in the bottle. By this, we can avoid the patient's problems and even the hospital staff also feel at ease. This system improves efficiency in the work giving greater results in the hospital maintenance. It is cost effective and even flexible for nurses.

II. PROBLEM STATEMENT

When saline is attached to a patient, the nurse sets the droppage speed and leaves. But when the saline is finished from the bottle there is no way of knowing it unless and until the patient tells the nurse. But till changing or removing saline the whole system will act as a pump in and pump out machine which will cause pain to the patient because it is just pumping the air in and out, in some cases this arises the problem of backflow of blood immediately after the saline bottle is empty.

III. METHODOLOGY

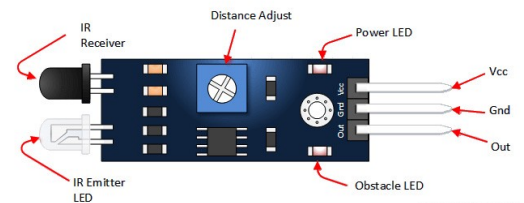
Based on our problem statement, we have created a prototype to protect the patient from getting harmed. An IOT based saline level monitoring system is proposed. The proposed model incorporates a sensor which continuously detects the saline

drops and three minutes prior to the saline content getting empty an alert is sent to the nurse or doctor.

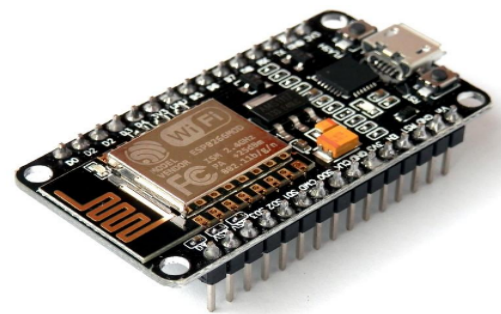
IV. COMPONENTS USED

1 Hardware

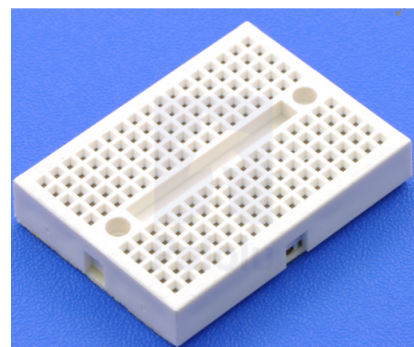
- IR Sensors – 2



- ESP8266



- Bread Board



- Jumper Wires

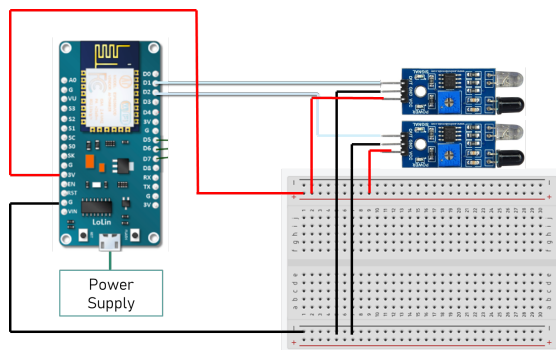


2 Software

- Arduino IDE

V. WORKING

With the help of the first IR sensor will detect the drops in the drip chamber and the program will calculate the drip speed and estimate the time. This will determine the time at which the bottle will get empty. Data will be uploaded to the server simultaneously. The system will then send a message 3 minutes prior to the bottle getting empty. If the Doctor/Nurse responds to the first alert then the system will get reset. If the first alert doesn't get the response, second IR sensor detects the liquid level and if goes down the certain level then the second alert message is sent.



Circuit Diagram

VI. CONCLUSION

With an automatic saline monitoring system, the manual effort of continuously monitoring patients injected with saline by the nurses will be reduced. This will lessen

the worry in persistent observation by the medical caretaker at a reasonable expense.

In future work, it can send wireless messages to doctors and nurses about the saline droplet rate, it can also include the smart health system, which gives the information about different body parameters. This can help in deciding whether the patient requires another saline bottle or not.

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The days we have spent in the institute will always be remembered and also be reckoned as guiding in our career.

REFERENCE

- [1]Low-Cost Digitization of Infusion Pump for Real-time Automated Flow Rate Monitoring and Warning.
- [2]Smart Saline Level Monitoring System Using ESP32 And MQTT-S.