

IOT Based IV Bag Monitoring and Alert System

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Abstract

In modern years, we have seen much more technologies are upgrading which helping us to take better care of patient's health and convince them fast and safe recover. When the patient gets admitted in the hospital the most basic thing is given to the patient fluid and electrolytes to increase their strength and energy. In most of the hospital almost all the patients, mainly ICU patient, have to adjust the volume of the fluid and electrolyte into the bloodstream 24x7 which is done using drip. These drip or IV bag need to regular monitor or changing the to maintain fixed flow of fluid or to prevent any infection. Anyhow this system is simple, but in overcrowded hospital when there is large number of patients present in the hospital so there is risk of insufficiency of nurses can put patients at health risk which a sink patient's health more savagely or in worse case it can lead to death. Almost in all hospitals the nurses are responsible for monitoring the drip level. But disastrously, because of their frenzied schedule, the observer may get forget to check every patient or to forget to change the bottle at appropriate time. During pandemic hospitals were infest with patients so it become so hard for the doctor to monitor each and every patient even so many patients die due to untaken care. So to avoid such situation we are developing such system which will reduce the doctor works. To overcome such a critical situation, we are proposing the IOT Based IV Bag Monitoring and Alert System using Node MCU.

Keywords: *Efficient, Smartphone, Display screen Weight Sensor, Node MCU.*

INTRODUCTION

Intravenous Therapy is Medical Treatment we can deliver IV fluids in person's body. When we can deliver IV fluid it increases Immunity power as well as recovers patients as quick as possible. But now a day there is difficulty every time doctor are not available to monitor all patients at a time so in this project we are solving this problem the solution that is iv bag monitoring and alert system, it will help to monitor all patients every time automatically.

It will send the notification to the doctor or nurses when the bottle goes empty as well as if any difficulty arises to be continued flow of fluids and It checks the level of iv fluids present in a bottle and that notification goes to the doctors and nurses. Also we are providing facility that is a buzzer it will sounds when the bottle goes empty. If the fluid of iv bottle get stops then patient can face the problem's like Patients rehydrate their mouths, air embolism collapsed vein, fluid overload, infection, infiltration, Phlebitis etc.

This project Propose the method for hospital to efficiently monitor the IV Bag glucose level. Our proposed system

consists of a weight sensor that will detect the level of the bag. A control mechanism can alert the nurses and doctors if the fluid level in IV bag drops down at critical level to prevent air embolism collapsed vein, fluid overload, infection, infiltration, Phlebitis etc.

After that it's up to nurses if he/she wants to continue or change the IV bag. This project significantly improves the overall efficiency of the hospital personnel. Our main aim behind building this project is to provide a reliable, cost effective and automatic IV bag monitoring system which anyone can implement or operate easily without any problem.

Components-

- Weight sensor
- Node MCU
- Bag Stand
- LCD Display
- Hooks
- IC and IC base
- Resistors
- Capacitors
- Transistors
- Diodes
- SMP

Modeling and analysis-

Circuit Explanation: -

Intravenous therapy is used to deliver fluids, medications and nutrition directly into person's vein. IV therapy is commonly used for rehydration and to provide nutrients and is crucial to help an individual with making a speedy recovery of an admitted person. IV drips needs to be regularly monitored and replaced. The flow of IV fluid also needs to be metered depending on the patient and their ailment. This IV intravenous Fluid Monitoring uses a weight sensor to detect as the fluid level; in the IV infusion bottle goes to empty state. The system makes use of a weight sensor with an Atmega microcontroller and Wi-Fi transmitter and LCD display to achieve this functionality. This allows for IV monitoring system.

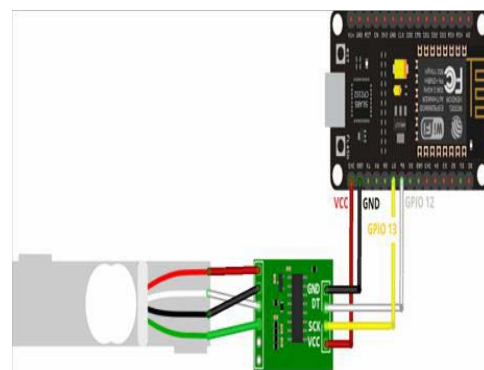
The weight sensor is attached to a small stand. The stand is fabricated with a cross section at bottom to balance it. A small rod stretching from the top allows user to suspend the weight sensor hook on the stand. The weight sensor calculates overall the weight of IV Bottle First it calculates weight of an empty bottle. This is considered as empty weight. When IV bag is suspended onto the sensor stand, it keeps on dripping until the fluid runs out. The value of weight sensor is constantly

transmitted to atmega microcontroller. The controller constantly processes this data and processes it.

The current level of IV bag is parallel displayed on LCD display. And this data is transmitted on IOT server via WIFI Module. This level is displayed on IOT server online. As soon as the level falls below certain level it LCD display. 5 kg weight sensor is connected with Node MCU by using HX711 load cell amplifier module. The HX711 is a precision 24-bit analog to digital converter. it gets measure of that bottle. We can display the measured weight in LCD display. And we send the values to doctors through the notification.

The notifications will received the doctors all the time. Thus the IV bag monitoring can help to reduce the risks of the patients.

Block Diagram: -



Circuit Diagram-



Application:

1. This application is used in hospital to monitor IV Bag
2. This project is used in government and private hospital.
3. Health and organization sector

Advantages:

1. Easy to operate
2. Low power consumption
3. Useful for managing large of patients during times of crisis.

Future scope:

The future development study and research of portal will enable us to newer, fresher and advance utilizes in our project Due to scalability made possible into the IOT, there is huge scope for development in future. We can add extra features in this this project will monitor only one IV bag but applying various technology and

methods on this project we can do it for more than one IV bag.

CONCLUSION

This study proposes an IOT-based monitoring and control platform for IV infusion setup. The suggested work will reduce the amount of time and work of nurses and doctor to check IV bag continuously. It also improves the clinic efficiency, safety and patient experience in hospital and make home care possible for many patients.

The weight sensor which is used in project simplifies and expedites system implementation. The display screen also help to show the all updates of IV bag all the time. This system may be quickly installed on the stand where the drip bottle is hung, making replacing the bottle simple without having to bother about all the gear.

REFERENCES

1. Sanjay.B, Sanju Vikasini.R.M, “ IOT Based Drips Monitoring at Hospitals” 2020 International Research Journal of Engineering and Technology (IRJET) Volume 07, Issue 04 (April 2020)
2. S. N. Ibrahim, M. S. L. Hakim, A. L. Asnawi and N. A. Malik, "Automated Water Tank Filtration System Using LDR Sensor," 2016 International Conference on Computer and Communication Engineering (ICCCE).
3. N. Giaquinto, M. Scarpetta, M. A. Ragolia and P. Pappalardi, "Real-time drip infusion monitoring through a computer vision system," 2020 IEEE International Symposium on Medical Measurements and Applications (MeMeA).
4. H. Amano, Hidekuni Ogawa, W. Caldwell, “A remote drip infusion monitoring system employing Bluetooth,” 2012 Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2012. DOI:10.1109/EMBC.2012.6346356
5. Mohammed Arfan, M Srinivasan, Adithya Gowda Baragur, “Design and Development of IOT enabled IV infusion rate monitoring and control device for precision care and portability,” 2020 4th International Conference on Electronics, Communication and Aerospace Technology (ICECA), 2020. DOI: 10.1109/ICECA49313.2020.9297376