

**THE DESIGN AND IMPLEMENTATION OF AN AUTOMATED LIQUID
OBSERVATION AND CONTROLLING MECHANISM UTILIZING AN
AFFORDABLE LIQUID SENSOR AND MICROCONTROLLER**

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ABSTRACT: During latest years due to the technological advancements many state-of-the-art strategies has been developed for assuring fast restoration of the sufferers in hospitals. For suitable affected person care in hospitals, assessment and management of patient's fluid and electrolyte need is the most fundamental factor required. All most in all health centre, a help/nurse is liable for monitoring the IV fluid stage continuously. But unfortunately during maximum of the time, the observer may neglect to change the saline bottle at accurate time because of their busy time table. This may additionally results in several problems to the patients along with backflow of blood, blood loss and so forth. To overcome this critical state of affairs, a low cost RF based automatic alerting and indicating tool is proposed in which IR sensor is used as a stage sensor. It is based totally at the principle that the IR sensor output voltage degree adjustments when intravenous fluid stage is under certain limit. Sophisticated health tracking systems have become developed with the help of electronic components together with sensors, PLC, microcontrollers etc. With clean interfacing. This paper especially makes a speciality of presenting superior saline degree tracking device. The concept is to provide price powerful, dependable and automated saline glide monitoring machine which can be without difficulty applied in any medical institution and can be smooth for doctors in addition to nurses to display the saline go with the flow from a distance.

KEYWORDS: Adaptive control, low voltage ride through(LVRT), photovoltaic (PV) power systems, power system control, power system dynamic stability.

1. INTRODUCTION:

Generally, as the populace growth increases, the want for health care additionally increases. Hence, it's miles an obligatory component for all and sundry in this world to take care of their health well. In this situation, retaining patient's safety is the pinnacle maximum priority to take delivery of in all hospitals. Now days, many automatic health monitoring gadgets are advanced to make sure sufferers protection and to reduce the stress of the medical doctors [1]. The invention of such devices introduces a drastic change in scientific area for tracking the parameters like heart beat price, detection of heart attack signs and symptoms and lots extra robotically with interdisciplinary nature. Even though many superior computerized devices are used, making sure the safety of the patients at some stage in IV period is still a difficult difficulty. Intravenous (inside vein) therapy is the infusion of liquid substances at once into the vein [2][3]. Therapies administered intravenously are regularly referred to as strong point prescription drugs or drips. Even although tracking the IV fluid stage of affected person is a small issue for a nurse but it's going to have an effect on the patient fitness significantly at some point of illness if the assist does not monitor it often. This may also leads to blood loss or backflow of blood to IV tube from their vein. This consequences within the reduction of haemoglobin degree of sufferers and it can additionally make the individual anaemic [4]. The project

of assessing and dealing with the patients with enough talent needs to be an essential issue for an amazing patient care. Hence to assure the safety of the patient all through IV duration there's a need to develop a green fitness tracking device. This can be done with the proposed idea of RF based totally IV fluid degree indicating system where IR sensor, RF transmitter, receiver and buzzer are used to offer intimation to govern room both to exchange the intravenous set or to replace it off. This will reduce the strain in continual tracking by the physician or nurse at a less costly fee.

2. PREVIOUS STUDY:

Due to the development in technology, the progress in clinical subject is rapid. A reason behind that is not anything however the combination of clinical and engineering disciplines. When the Normal Saline (NS) is to be positioned intravenously then it's miles called as sterile. Normal saline is typically referred as sterile answer of sodium chloride (Naci) in water. Generally, in hospitals saline degree is monitored via nurses and sufferers household. There is usually a want to test the saline degree after certain time. The existing device for saline stage tracking is very time ingesting and inconvenient for nurses. The important objective of proposed system is to provide dependable, handy, easy and value effective device for saline stage tracking. As the saline goes under the crucial stage, it is vital to trade the saline bottle [5]. A computerized saline stage tracking system includes IR sensors that are used to decide the fate of liquid in the bottle whether it's miles every day or warning repute. Bluetooth module and CC2500 wireless module act as transceiver, due to which the notification can be sent to the nurse on her mobile in addition to computer.

3. PROPOSED SYSTEM:

The supply unit consists of battery, simple filter and regulator IC 7805 that's used to provide supply voltage of 5v. There is a provision of the usage of transformer as well as adaptor of 12volt and 1 ampere contemporary [6]. If transformer is used then bridge rectifier and 1000 microfarad capacitor is furnished. Transmitter is used to transmit the facts via microcontroller to the receiver. Receiver is connected to computer or computer. TTL to USB converter is used to gain statistics on laptop or laptop so that nurse as well as medical doctor can recognize the saline stage with the help of serial port check window that is displayed on laptop or pc. The Bluetooth module is used to ship the facts wirelessly on nurse's smart cell phone and the effects are displayed with the help of Bluetooth terminal software. Due to using wi-fi modules, it is simple for nurses as well as medical doctors to test the saline degree without going at affected person's mattress. In the programming, the essential degree is ready at 70ml. Generally, saline bottle includes 500ml answer. When the saline answer is above 70ml then green led will blink and while the saline solution falls below 70ml or the important degree then pink led starts off evolved blinking and buzzer will start ringing if you want to be smooth for nurses or affected person's loved ones to recognize the exact function of last saline solution within the bottle. An IV drip is usually used for long term treatments. But it may also be used for quick term treatment to rehydrate sufferers or to present them medicines to revitalize them. It is a completely green procedure for quick offering the prescribed drug treatments into the whole body [7]. The intravenous remedy is not only used to accurate electrolyte imbalances however it can additionally be used to deliver drugs. Patients folks who can't devour enough vitamins or who cannot devour at all due to an infection, surgical operation or coincidence, may be feuded with enough nutrition through their vein the usage of IV therapy. These sterile solutions (sodium and dextrose) containing vital nutrients to aid the human life which is injected into the patient's body via a tube attached to the needle. Due to loss of being concerned, many problems will rise up such as blood loss, backflow of blood thru an IV tube. To conquer this situation a powerful concept is proposed to increase a powerful fitness tracking gadget which alerts the health practitioner or nurse whilst the fluid stage of saline bottle is beyond the brink restriction. It contains of IR sensor, RF transmitter, Receiver, buzzer, and so forth. Basically IR transmitter transmits an IR ray that is obtained by the IR receiver and the measured output is in terms of voltage. Fig. Shows the block diagram of Automatic drips degree Indicating machine.

4. SIMULATION RESULTS:

The programming is primarily based on controller platform that's completed the usage of C compiler. The consequences are received on Smartphone with the help of Bluetooth terminal software and are acquired on pc or pc the usage of serial port check software. The results include wide variety of droplets coming from saline bottle, the answer given to affected person in ml, the droplet price and last answer in bottle.

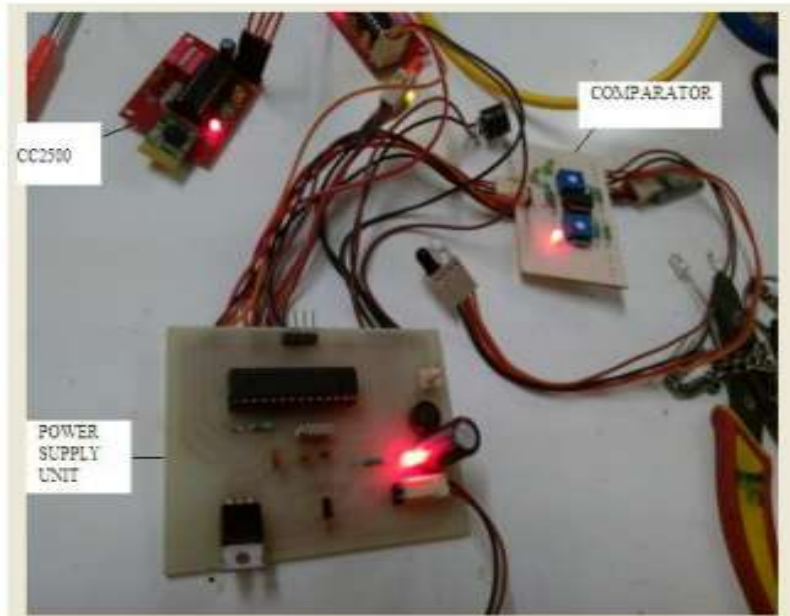


Fig.4.1. Hardware kit diagram.

The above system became finished in all the three rooms (control room). Here the receiver is constant at a centralized area which gets all statistics and it feeds the ones to controller. Then according to the guidance written within the controller, it plays the sequence of operation, with display device LCD and buzzer. LCD shows the room wide variety of the patient needed to alternate the saline bottle. The buzzer is used to supply alarm until observer trade the saline bottle. The fig. Indicates the LCD which presentations room range of affected person. In traditional technique, IR sensor is used as drift fee sensor that is used to give intimation to alternate the intravenous set on the last moment. This can also leads to extreme fitness issues and additionally to late healing. Here the name IR sensor is usually recommended to apply as a stage sensor for imparting the intimation to the help to trade the intravenous set. This is implemented with an easy controller, IR sensor, RF transceiver to offer the right information at imply time and it's also be nearly possible and less expensive.



Fig.4.2. Sensor section.

5. CONCLUSION:

The machine which could routinely display the saline drip rate by using microcontroller. It can wirelessly ship the records to nurse's or doctor's laptop and display the consequences in the shape of saline droplet price, range of droplets coming from saline bottle, saline solution given to the patient in ml and ultimate time to empty the saline bottle with the assist of serial port check software program. The system is dependable, cost powerful and convenient for nurses. It may be reused for the subsequent saline bottle. It is beneficial for nurses in addition to docs at rural hospitals. Nurses can without difficulty monitor the saline stage from distance. It is specifically advantageous at night time timing as there's no need for nurses to go to patient's bed to test the extent of saline in the bottle.

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