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INTRAVENOUS FLUID LEVEL INDICATING SYSTEM

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Abstract – *During recent years because of the innovative progressions many advanced procedures has been developed for guaranteeing quick recuperation of the patients in medical clinics. For good patient consideration in emergency clinics, appraisal and the executives of patient's liquid and electrolyte need is the most basic thing required. All most in all medical clinic, a help/nurture is liable for observing the IV liquid level persistently. However, tragically during more often than not, the spectator may neglect to change the saline container at right time because of their bustling timetable. This may prompts a few issues to the patients, for example, reverse of blood, blood misfortune and so on. To beat this basic circumstance, an ease RF based programmed alarming and showing gadget is proposed where IR sensor is utilized as a level sensor.IR sensor demonstrate the degree of glucose bottle. LCD at the control room shows the room number of the patient for speedy recuperation.*

Key Words: **Intravenous liquid, RF Transceiver, IR sensor, Arduino Controller, Buzzer, LCD**

1. INTRODUCTION

Saline, one of the most well known intravenous treatment assumes a significant job in the administration of patients who are fundamentally sick. Reconnaissance of saline container level is significant on the grounds that when the bottle is exhausted and the needle isn't expelled from the vein then the blood streams outward into the bottle. In emergency clinics, the medical attendants or guardians are liable for checking the saline container level. For the most part, because of carelessness and any abnormal condition, the specific planning of expelling the needle from the patient's vein is disregarded which causes a genuine setback and may prompt demise too. To prevent the accident due to the obliviousness of overseers and to give awareness of attendant, the proposed is practical smart saline level observing gadget which incorporates IR sensor and LCD show. The framework is built by utilizing IR sensor and microcontroller. IR sensor can be utilized to gauge the heaviness of the trickle or to identify the movement of stream of drip.IR sensor will be set around the bottle which is portable and can be fixed anytime at which level medical attendant is required. At the point when the glucose level arrives at where sensor is fixed naturally buzzer will be turned ON at tolerant space for the sharpness of patient just as the attender/nurture. At receiver side LCD is utilized to show the arrived at an incentive just as demonstrate the room number where the trickle bottle must be supplanted which can caution the medical caretaker station. This framework keeps nurture/attender mindful of reach of low degree of dribble bottle.

2. EXISTING SYSTEM

The existing framework consist of voltage controller which is interfaced with microcontroller which is used to supply a consistent voltage of 5volts. The transmitter part comprises of a load cell. Load cell is a transducer that is used to create an electrical signal whose magnitude is propotional to the force being measured. Load cell which here is used to measure the weight of the glucose bottle .The weight of the glucose bottle is not measured accurately.

3. PROPOSED SYSTEM

In this proposed system, voltage regulator is connected to the microcontroller which isused to supply a constant voltage of 5volts.The transmitter part consist of a IR sensor.Infra Red sensor can measure the heat of an object as well as detects the motion.It emits in order to sense someaspects of the surroundings. LEDs are connected for the level indication of the fluid levels. An RF module is used both at the transmitter and the receiver side. RF module is a small electronic device used to transmit and/or receive radio signals between two devices. This wireless communication can be accomplished through Radio Frequency (RF) communication. IR sensor will be placed at the trip stand which is movable and can be fixed at any point. The sensor can be fixed at any point at which level nurse is needed. When the glucose level reaches the point at which sensor is fixed automatically alarm/buzzer will be turned ON. LED indicator will indicate the nurse station by glowing the LED. As the glucose level reaches the fixed point automatically message will be sent to the nurse station and will be displayed at LCD display. The concerned nurse can change the trips bottle.

3.1 Block Diagram

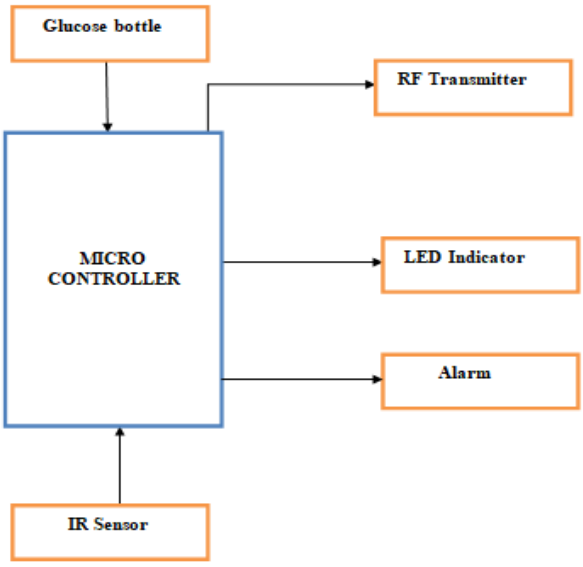

Fig- 1: RF Transmitter side Block Diagram

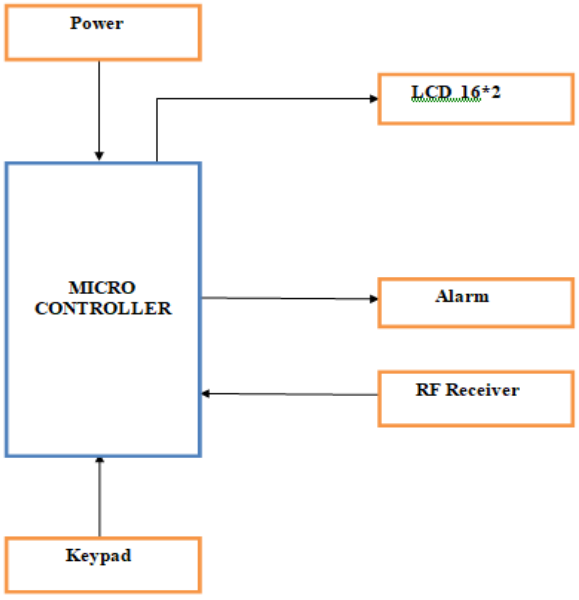

Fig- 2: RF Receiver side Block Diagram

4 HARDWARE DESCRIPTION

4.1 Arduino UNO

The Arduino Uno is an open-source microcontroller board subject to the Microchip ATmega328P microcontroller and made by Arduino.cc. The board is equipped with sets of modernized and basic data/yield (I/O) sticks that may be interfaced to various improvement sheets (shields) and diverse circuits.

Fig .4.1 Arduino UNO

The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) by methods for a sort B USB connect.basically partner it to a PC with a USB connection or force it with an AC-to-DC connector or battery.

4.3 PIC (16F877A) :

PIC is a family of microcontrollers made by Microchip Technology, originally developed by General Instrument's Microelectronics Division.PIC had read-only memory (ROM) or field-programmable EPROM for program storage, some with provision for erasing memory.Newer models allow the PIC to reprogram itself. Program memory and data memory are separated. Data memory is 8-bit, 16-bit, and, in latest models, 32-bit wide. Program instructions vary in bit-count by family of PIC, and may be 12, 14, 16, or 24 bits long. The instruction set also varies by model, with more powerful chips adding instructions for digital signal processing functions.The hardware capabilities of PIC devices range from 6-pin SMD, 8-pin DIP chips up to 144-pin SMD chips, with discrete I/O pins, ADC and DAC modules, and communications ports such as UART, I2C, CAN, and even USB. Low-power and high-speed variations exist for many types.

Fig 4.2 PIC16F877A

4.4 LCD Display

A Liquid Crystal Display is a slim, level feature contraption made up of any number of concealing or monochrome pixels showed before a light source or reflector. It is much of the time utilized in battery-controlled electronic contraptions since it uses very humble amounts of electric force.

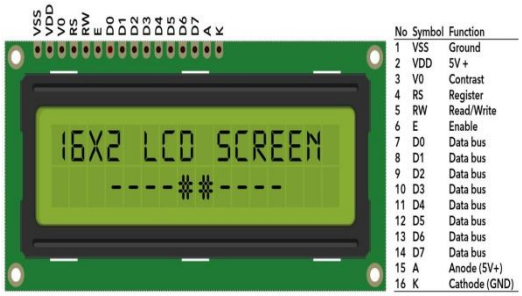

Fig 4.3 LCD Display

4.5 Transformer

Transformer is a passive electrical device that transfers electrical energy from one electrical circuit to one or more circuits. A varying current in any one coil of the transformer produces a varying magnetic flux, which, in turn, induces a varying electromotive force across any other coils wound around the same core.

Fig 4.4 Transformer

Electrical energy can be transferred between the (possibly many) coils, without a metallic connection between the two circuits. Faraday's law of induction discovered in 1831 described the induced voltage effect in any coil due to changing magnetic flux encircled by the coil.Transformers are used for increasing alternating voltages at low current (Step Up Transformer) or decreasing the alternating voltages at high current (Step Down Transformer) in electric power applications, and for coupling the stages of signal processing circuits..

4.6 IR sensor

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion.Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. The producer is basically an IR LED (Light Emitting Diode) and the identifier is just an IR photodiode which is touchy to IR light of a similar wavelength as that discharged by the IR LED. At the point when IR light falls on the photodiode, The protections and these yield voltages, change with respect to the size of the IR light got.

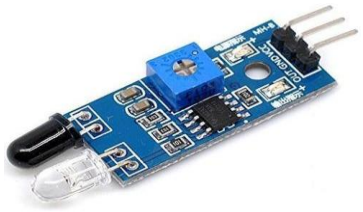

Fig 4.5 IR SENSOR

5. Result

Transmitter side

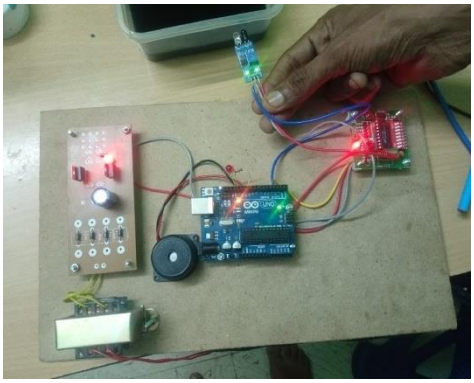

Fig 5.1 Transmitter Side prototype

At transmitter side, IR sensor is utilized for foreseeing the degree of fluid inside the trickle bottle. As IR sensor is fixed at certain point, the degree of the fluid when arrives at its point naturally signal/caution will turn ON. Driven beginnings shining at patients room

Receiver Side

At reciver side, LCD is utilized to show the arrived at an incentive just as to demonstrate the room number where the trickle bottle must be supplanted which can alarm the medical caretaker station. Caution can likewise be utilized

at nurture station for regular readiness of medical caretaker or attender

Fig 5.2 Receiver Side prototype

5.1 Simulation

Transmitter Side

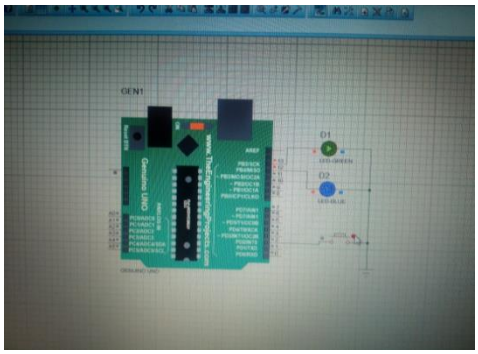

Fig 5.2 Transmitter Side Simulation output

Receiver Side

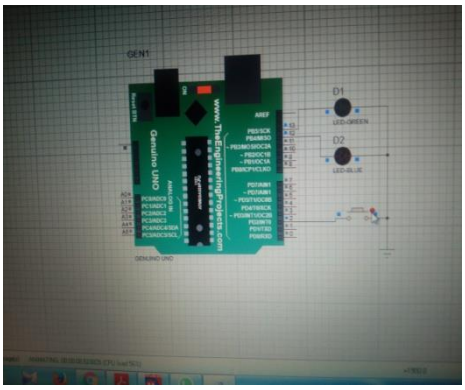

Fig 5.3 Receiver Side simulation output

6. CONCLUSION

The proposed framework enables appropriate observing of the glucose to even without any specialist or medical caretaker in this manner guaranteeing total wellbeing of the patient's wellbeing. When this glucose level pointer appears the individuals dealing with the patients and their in-charged medical attendants need not stress over the time that will take for the glucose container to be purged. They can accomplish the work without agonizing over reach of excursion jug and in this manner the messages showing the set estimation of the glucose bottle is sent to the medical caretaker station. Attender/medical attendant can go at the correct time and supplant the glucose bottle when that gets unfillede. It is of high bit of leeway to the patients particularly during evening times. This framework additionally keeps away from the lethal danger of air bubbles entering the patient's circulatory system, which is a genuine risk as air rises in blood can cause quick demise. It is savvy brilliant trickle level checking framework. The goal of growing such a framework is to lessen social insurance costs and furthermore demonstrate a quicker method for correspondence

7. FUTURE WORK

A wireless healthcare monitoring system by means of using mobile devices and sensors can be implemented in a global network with the help of Arduino and Raspberry Pi. The devices and IoT gathers and share information with each other, making it possible to collect, analyse and monitor data more accurately. Thus IoT can be used for monitoring the patient and providing services in a timely manner. The proposed system can be enhanced and extended by using other invasive as well as non-invasive sensors for picking up essential medical potentials of a patient. This can be further analysed, stored and transferred on a global platform.

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