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Smart Automatic Drip Bottle Exchange System Using LabVIEW

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ABSTRACT: Now a days, Drip bottle injection is one of the most commonly practised procedure to aid in treating a person. Modern lifestyle has led to a dramatic increase in health condition such as diabetics, irregular blood pressure, heart condition etc., which need frequent assistance of drip bottle injection during clinical procedure. Drip injection also plays a major role in aiding patients with proper hydration, sugar level and intake of essential fluid needed for recovery. In this project, the level of the bottle is monitored by LabVIEW and the information is passed to mobile through IoT technology. The level of the fluid is sensed by level sensors and the data's are shared to LabVIEW. We use cloud computing to handle bulk data's without any reductions in efficiency. The common procedure to replace the empty drip bottle is by manually replacing them with the help of the attenders which is not efficient all the time. To avoid any error or lack of attention by the attenders which leads to patient's wellbeing, we incorporate the techniques of automation by utilizing anelectric solenoid to replace the empty bottle with a new one at the right time.

KEYWORDS: LabVIEW, IoT, Cloudcomputing, Sensors, Data Monitoring, Electric Solenoid

I. INTRODUCTION

If Attendant in Hospitals have forgotten to change the Glucose drip bottle at once it emptied, it would bring a bad consequence to the Patient's health. An alerting signal like sound alarms for replacing the glucose drip bottles is being used in very few hospitals. The sound alarms may not be heard by Attendants at sometimes, if they are not too near to the Patient. Obviously, the sound cannot be increased in the hospital zone. Hence, Replacing the sound alarms with the alerting phone message may be considered as an efficient method. So the level sensor is used to sense the level of the glucose in the drip bottle. The sensed level will be sent to the mobile through Wi-Fi module. The measured level will be displayed both in LabVIEW and Cloud Server and the time of the level also will be monitored and stored.

II. LITERATURE REVIEW/SYSTEM MODEL

S.NO	PAPER TITTLE	AUTHOR-YEAR	OBSERVATION
1	Automatic Indication level of Glucose System in Glucose trip bottle	S.Gayatri , et al; - 2019	Alert message sending to nurse method
2	Remote Monitoring the glucose bottle Level in Hospitals	S.Ram Kumar, et al; - 2018	GSM and alarm used to indicate Glucose level
3	Intravenous Fluid Level Indicator	A. Arulious ,2017	Load sensor used to detect the glucose level

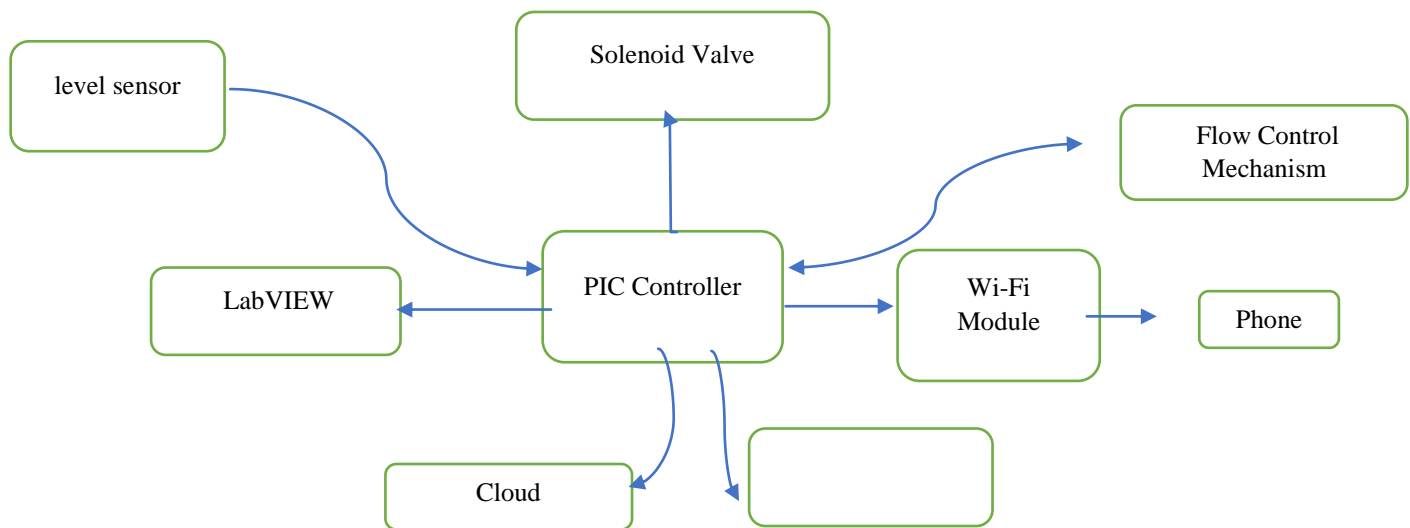
In this module consists two Glucose bottles with flow monitoring system. Each Glucose bottle connected by Solenoid valves (each one). These valves are connected with PIC Controller and level sensors.



The Glucose level is observed by PIC Controller along with-it patient’s Body temperature and they are measured by corresponding sensors which are interfaced with PIC Controller and these values are stored in LabVIEW also. The PIC Controller is connected to pass the information to the server which is the cloud storing IoT technology.

This data with (4) Stop Message send to user by Wi-Fi Module (i.e.) Starting of Bottle (1) Stopping of Bottle (1) and Starting of Bottle (1) and Stopping of Bottle (2) each (4) Message sending with Patient details to user.

Block Diagram



Once the module Starts first patient details (i.e.) Body temperature is measured by sensor. These details are stored in server by LabVIEW and after that solenoid valve (1) getting energized by PIC Controller and tripping will starts.

Whether Glucose willflow or not also it’s flow Speed controlled by flow control Mechanism that is the flow values sensing mechanism. After Starting of first Bottle dripping ((i.e.) flow feedback is normal Means) the Message (i.e.) Bottle (1) dripping Started and normal Message with Patient details (Body temperature) send to user.

In case any Problem occurs((i.e.) flow rate value is high/solenoid valve not work properly fault/error Message will send to user. After Bottle (1) dripping completion, if flow rate value is not coming for Particular time delay Means Bottle (1) is Completed.

First Solenoid valve starts to deenergized and after deenergizing valve will Starts for some Time Example one Minute Second Bottle Solenoid will be getting energized and again it’s flow rate and flow Speed are sensed and Controlled by flow Control mechanism if everything Normal Means System Start and Normal Message will send to user with Patient, Body temperature output, else fault/error Message will send to user. From which attendants will monitoring the patient’s temperature and fluid level periodically.

All details including flow rate, level of Glucose Bottle, Solenoid valve number, Patient Body temperature Periodically Stored in cloud by LabVIEW.

Here Wi-Fi Module is used to send Message to user four times only (i.e.) 1) Bottle (1) Starts Normal/error and 2) Bottle (2) Starts Normal/error and 3) Bottle (1) completion 4) Bottle (2) completion with all-time Patient details.



III. COMMUNICATION

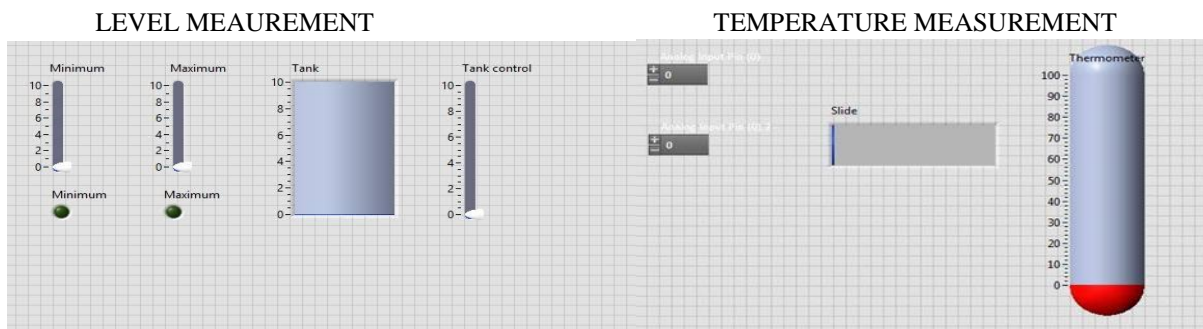
The Internet of Things (IoT) is a modern technology that describes the network of physical objects “things” that are interface with sensors, software, controllers and other technologies for connecting and share data’s with other device and store data’s through internet or Local area network (LAN) using CLOUD storing technology. In this model, we have used “Think Speak”-IoT web server is a web based(server) open application IoT source that carried data’s to store and retrieve in future from the cloud source or Local Area Network as a communication server. Think Speak provides instant visualizations of data inferred by your device through internet. Think Speak stores the data from sensor that analyse and visualize with software. Think speak communication act as “Data packet” which is interfaced with “PIC Controller”. The server will store the data’s and the data’s in cloud will be stored as permanently and then the data’s can be used to communicate with other device like mobile etc., .The primary feature of Think Speak communication is ”channel” that have field for data, location and status of data’s which stored in Think Speak. We can easily send sensor data’s to other modules. In this sensor data’s are processed and will be send to mobile from cloud through IoT. Here two way of communication is possible one with graphical representation (LabVIEW) and other with status of data’s through cloud.

IV. SCOPE OF MODEL

The Fluidlevel and Temperature is monitored periodically and visualized in graphical representation in LabVIEWsoftware. Automatically exchange drip bottles once it emptied through mechanical actions like Electrical solenoid valve. Communication server is used to store and retrieved data’s and alert messages will also be sent to the mobiles though IoT.

V. RESULTS

The figure shows the output of level and Temperature using LabVIEW

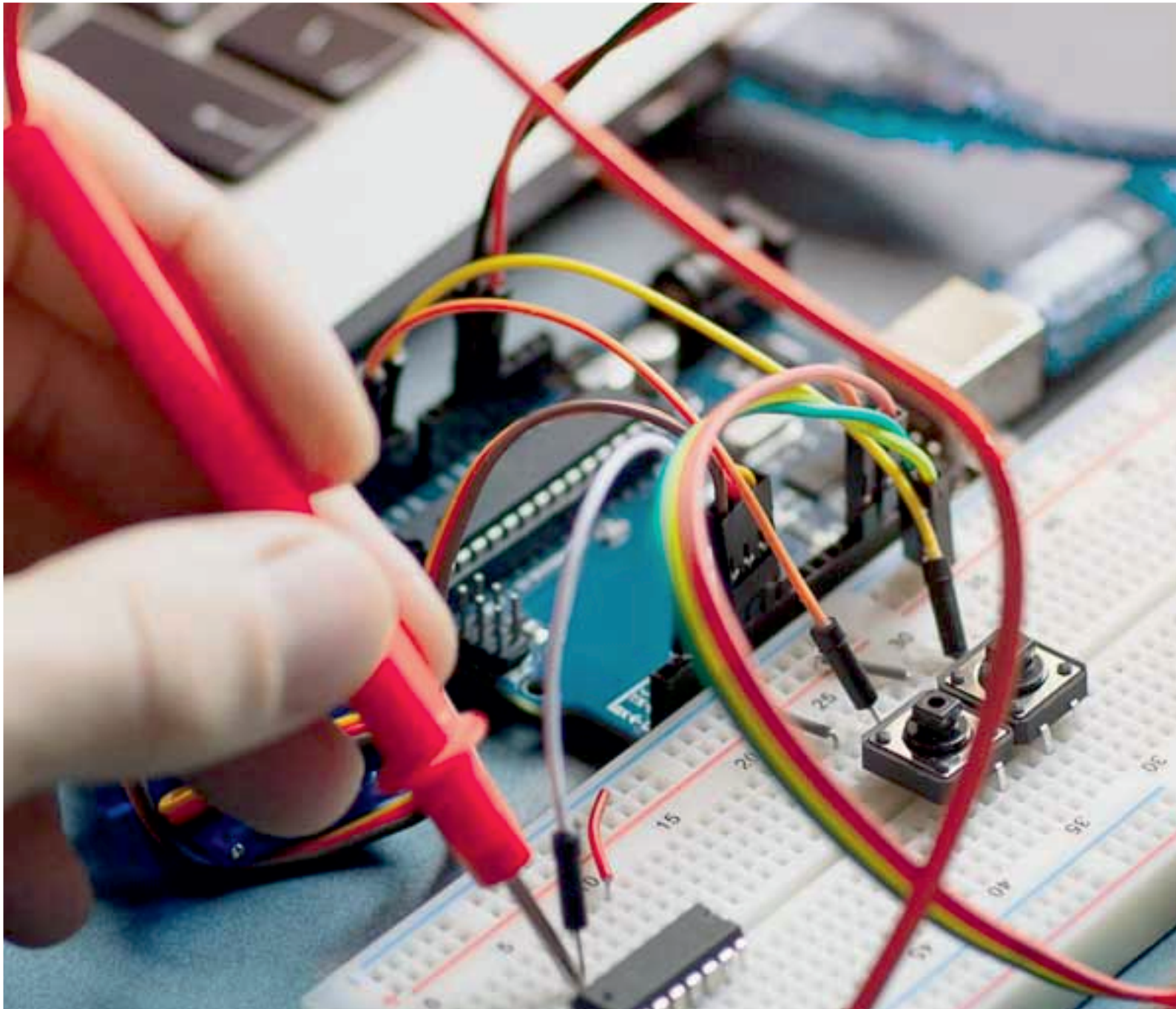


VI. CONCLUSION

We have developed a model in which we sense temperature, flow, level and monitor by LabView with PICController. Through our model the fluid flow control through solenoid valve and if the drip bottle gets emptied next bottle exchange by opening next valve automatically. From which we monitoring as well as automatically exchange the bottle. The data’s from sensor pass to alerting devices through IoT Think speak web server technology.

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