

Automatic Drip Bottle Exchange System Using Electric Solenoid By LabVIEW

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Abstract: In day to days lifestyle, the drip bottle injection plays a most vital role in saving the patient’s life. As the level of diabetic, accident survivors and other causality out patients getting increased, the amount of dripping glucose bottle will also get increased. Drips are so important that the required nutrients for the patients and the supplements are sometimes passed through drip bottle and other things including daily fluid to people who cannot drink water during surgery and also to maintain patient’s hydration and blood sugar levels. In this project, the level of the drip bottle and the temperature of the patient’s body is monitored by LabVIEW and the information is passed to mobile through IoT technology. The level of the fluid is sensed by sensors and the data is passed to LabVIEW. In most of the hospitals, the drip bottle will be emptied and the another one will be exchanged by attendants. We are making to involve the automation in this area by exchanging the next drip bottle automatically. For this we use electric solenoid for exchanging the drip bottles automatically.

Keywords: LabVIEW, IoT, Cloud computing, Sensors, Data Monitoring, Electric Solenoid

I.INTRODUCTION

The system is Designed as a smart glucose drip bottle which can intimate and control the glucose flow automatically in hospitals. It is used to prevent the back flow of blood to the glucose bottle. It helps in reducing human work and to switch the next glucose bottle automatically if bottle is emptied. 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

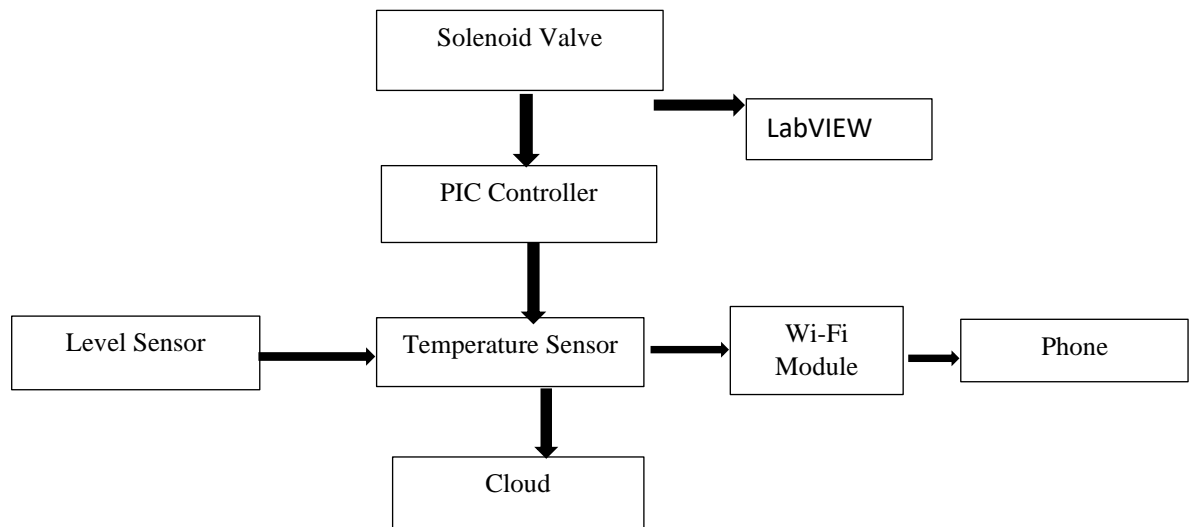
S.NO	PAPER TITTLE	AUTHOR-YEAR	OBSERVATION
1	Automatic Indication level of Glucose System in Glucose trip bottle	S.Gayatri , et al; - 2019	Alert message sending to nurse method
2	Remote Monitoring the glucose bottle Level in Hospitals	S.Ram Kumar, et al; - 2018	GSM and alarm used to indicate Glucose level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

In this module, the flow monitoring system is designed with glucose bottles. Each Glucose bottles are connected with Solenoid valves to each other. PIC Controller board and level sensors are interfaced with glucose bottles.

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 also to user.

FLOW CHART



Once the module Started collecting the patient details such as Body temperature, level are measured by their sensors. These details are stored in server by IoT technology and the drips will start to flow is controlled by solenoid valve through PIC controller.

Whether Glucose will flow 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) tripping 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

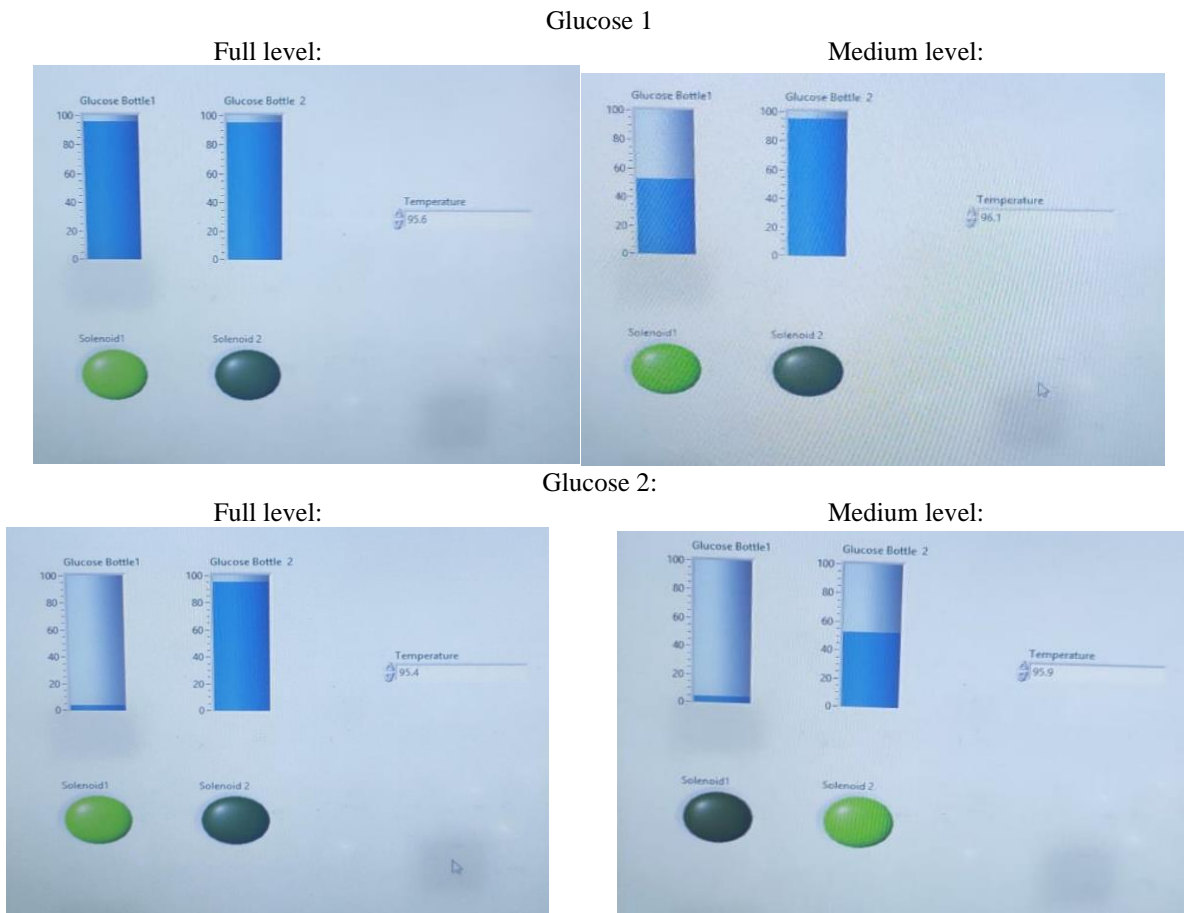
IoT (internet of things) is used to communicate the sensor data's with other devices for messaging purposes. The Internet of Things (IoT) is a modern technology that describes the network of physical objects "things" that are interface with sensors, software, controllers and other technologies for connecting and share data's with other device and store data's through internet or Local area network (LAN) using CLOUD storing technology. Here communication is connected between PIC Controller and mobile device through IoT Think speak server 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. In this module, information collected by Think speak technology is pass to other devices like mobiles etc. for alerting purposes. Think speak communication act as "Data packet" which is interface 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... 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. Communication is easy in this module because of modern IoT.

IV.SCOPE OF MODEL

The Fluid level and body temperature is monitored periodically and visualized in graphical representation in LabVIEW software. 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.RESULT

The output of our model shows in figure



VI.FUTURE SCOPE

In future, we have an idea to add GSM module for alerting in SMS methodology along with some extra patient monitoring parameters like heart rate measurement, Blood pressure monitoring, flow rate monitoring and pulse rate measurement will be monitored periodically.

VII.CONCLUSION

We have developed a model with sensors for monitoring level and temperature with LabVIEW. In addition, with that drip bottle exchange by solenoid valve is a major part in our module. For communication, IoT technology using web server (Wi-Fi module) is used for efficient communication.

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