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Dam Gate Level Control with Water Quality Monitoring using IOT

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Abstract: ***The main objective of this project is to develop a mechatronics based system which will detect the level of water in a dam and thereby control the movement of gates using IOT in a real time basis which offers more flexibility. In addition to the gate level monitoring we have included another feature that is water quality monitoring. For best results, the principle operation of the automatic dam control arrangement is subjected to run under various possible circumstances, with IoT as the platform for working.***

Keywords: IOT, Mechatronics, Dam monitoring.

I. INTRODUCTION

During rainy seasons floods are natural to occur but when this occurs, the problem is raised.Water level in dam need to be maintained effectively to avoid complications. This is generally performed manually which requires full time supervision by the operators and have large staff complements. Most of the dam are built to serve more than one purpose. It is neccessary to implement a communication between the level monitoring system and computer modules or Android module. Generally the dams are operated through traditional survellience hence it results in human error therfore we are proposing a model where the dams are automated.

II. LITERATURE SURVEY

A. Xavier Litric, 'Robust IMC Flow Control of SIMO Dam River Open-Channel Systems', 'IEEE Transactions On Control Systems Technology. This paper deals with the automated management of a dam course system, where the action variable is that the upstream discharge and therefore the controlled variable the downstream discharge. The system could be a cascade of single input-single output (SISO) systems, and might be considered as a single input-multiple output (SIMO) system, since there are multiple outputs given by intermediate measure points distributed on a river. A generic strong style synthesis supported internal model controller (IMC) design is developed for internal model based controllers. The lustiness is calculated with the employment of a bound on multiplicative uncertainty taking into consideration the model errors, due to the nonlinear dynamics of the system. Simulations are carried out on a nonlinear model of the river.

B. Syed Sheraz Mohani, Syed Muhammad Umar Talha,Syed Hassan Ahmed and Mansoor Ebrahim, 'Design for Irrigation and Monitoring System of an Automated Dam' This paper explains the industry has always centered to plot for devise engineering methodologies for establishment and modification of relatively easier Controlling and Automation ways for any scrupulous method. This paper presents the planning and implementation of a impressive control system by means of microcomputers and information transmission networks. To verify the principle operation of the Controlling design to be presented a miniature Automated Dam model is experimentally tested employing a PC-based system.

C. Another monitoring system was developed for measurement of water levels, and it's composed of ultrasonic detector, PIC micro-controller, and GSM module. The ultrasonic sensor measures the gap between the sensor to the liquid surface. This method proposes the development of water level observation system by using the GSM module to alert the person-in-charge through Short Message Service (SMS),once the water has reached the critical level and it will automatically turns OFF the pump. It is possible to monitor the water level of whenever needed.

D. Drinking water is the most precious and valuable for all the kith and kin, drinking water utilities faces new challenges in real-time processing. This challenge occurred because of restricted water resources, population growth, ageing of infrastructure etc. Therefore there is a necessity of better methodologies for monitoring the water quality. Ancient ways of water quality testing methods involve the manual collection of water sample at different locations, followed by laboratory analytical procedures. Such approaches take longer time and cannot be considered efficient and it has several drawbacks:

1) Poor area coverage
2) It is labor intensive and high cost (labor, operation; and equipment)
3) The lack of real time water quality information to enable important decisions for public health protection.

III. BASIC SCHEMATIC

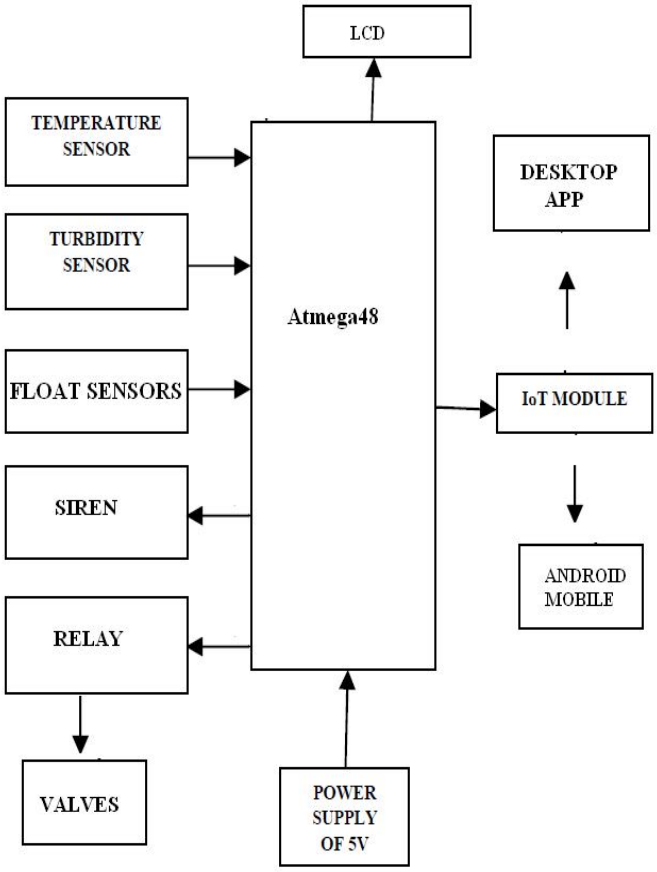


Fig1. Block diagram

ATmega48 microcontoller acts as heart of the model. The Microcontroller is interfaced with water level sensors, temperature sensor, IOT module, Turbidity sensor and LCD. Microcontroller gathers real time water level from water level sensor and humidity from temerature sensor. When the water is at high level, mid-level, low level the water is pumped out by motor1,motor2, motor3 respectively. Turbidity sensor senses the suspended particles in the water. if the water level reaches below the critical level the three motors will turn-off. All these information is sent to TCP client/android mobile or desktop app for user application and it is also displayed on LCD.

IV. IMPLEMENTATION

A. Determining The Level Of Water

in the first stage we plan on getting the level of water using ultrasonic sensor. The ultrasonic sensors are interfaced with micro controller which transfers a data to a local base station using a far field or near field communication.

B. Water Quality Testing

In this stage the turbidity sensor measures the turbidity of water .Based on the turbidity controller will decide ste whether water can be used for agriculture, drinking or industrial purpose.

C. SMS Communication

In this stage we work on transferring the obtained data to the registered mobile numbers through the GSM module.

D. Communication Over IOT

In this stage we deal with transferring the data to mobile application or desktop application through internet.

E. Flowchart of Implementation

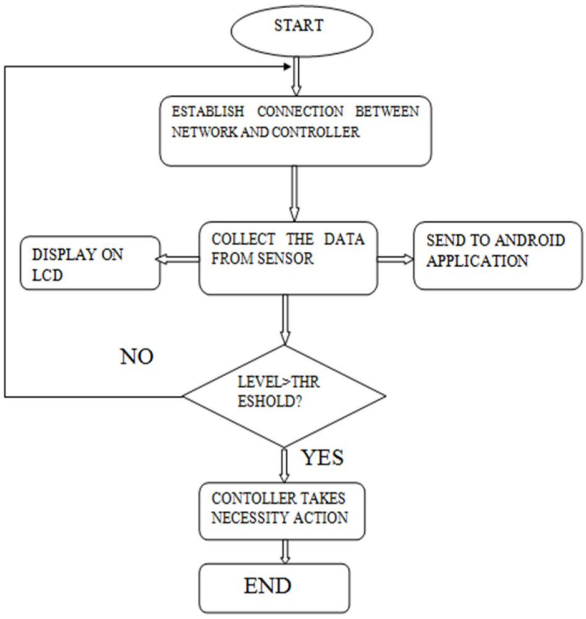


Fig 2.Flow chart

V. RESULT

We experimented the operation of the module under many conceivable situations. The outcomes were intriguing. To toss light on couple of perspectives. our module successfully sent messages to registered mobile numbers every minute and interfaced with the android application.

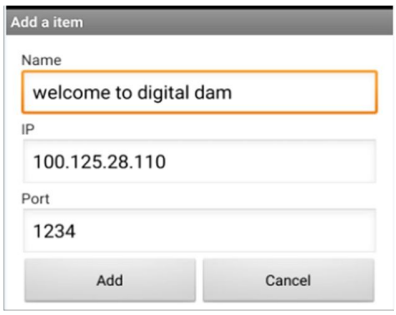


Fig 4: interfacing with android application

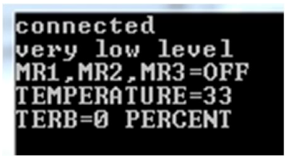


Fig 5: interfacing with android application

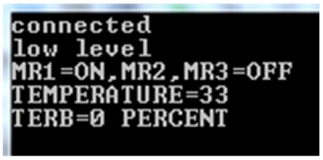


Fig 6: interfacing with android application

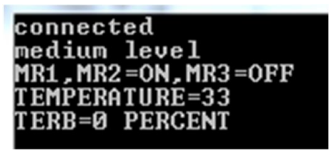


Fig 7: interfacing with android application

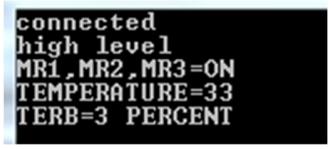


Fig 8: interfacing with android application

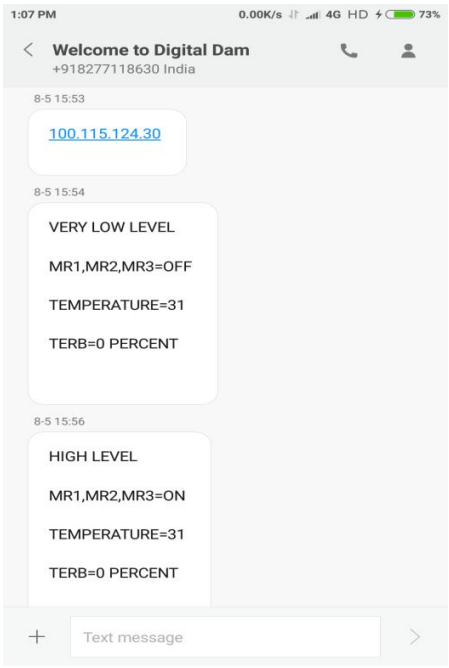


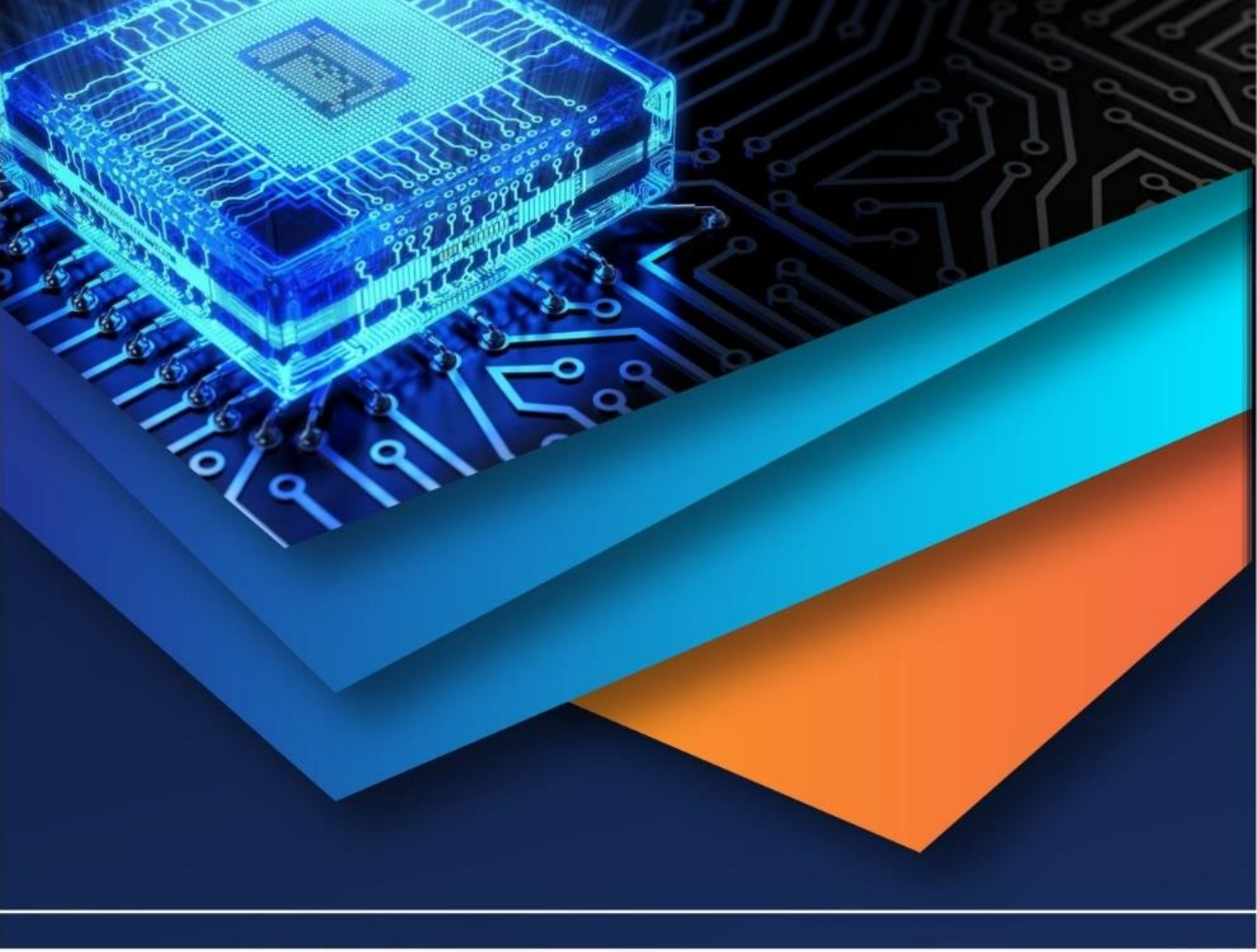
Fig 9: SMS sent to registered mobile number

VI. CONCLUSION

Our proposed model is not only automotive but also IOT based. This tested model has an added feature of water quality monitoring in all the possible conditions. This water leveling system is capable of interfacing with an android application via GSM module and is able to send status of dam to registered mobile nubers every minute. Real time status can be viewed on mobile phone or desktop app.

REFERENCES

[1] Xavier Litric, 'Robust IMC Flow Control of SIMO
[2] Syed Sheraz Mohani, Syed Muhammad Umar Talha,Syed Hassan Ahmed and Mansoor Ebrahim,
[3] Zachos, N., Kosmatopoulos, C. and Laopoulas, T. A Wireless Network of Remote Measuring Stations: Application In Water Level Monitoring. Proceedings of the IEEE International Symposium on Industrial Electronics, 1995, 153-156.
[4] Talha, S.M.U., Mohani, S.S., Ahmed, S.H. and Ebrahim, M., Design for an Irrigation and Monitoring System of an Automated Dam. Proceedings of the International Multi Conference of Engineers and Computer Scientists, 2012.
[5] Brito, N., Ribeiro, P., Soares, F., Monteiro, C., Carvalho, V. and Vasconcelos, R. A remote system for water tank level monitoring and control-a collaborative case-study. 3rd IEEE International Conference onE-Learning in Industrial Electronics, 2009, 19-23.
[6] Zhang, Z. and Hu, L.S. Performance assessment for the water level control system in steam generator of the nuclear power plant.Annals of Nuclear Energy45 (2012) 94-105.



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