IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology
Vol. 3, Issue 4, April 2016

Wireless Based Water Level Monitoring and Control System

Prof S.D.Anap[1], Dengale Rani V[2], Ghule Suvarna U[3], Jadhav Shradha B[4]

Dept. of Electronics, PREC, Loni, India[1]

Student of Electronics, PREC, Loni, India [2,3,4]

Abstract: Now a day's drainage blockage is the major cause of pollution and flooding in the Metro manila cities. Because of these people in Metro cities faces no. of problem such as bad impact on human health and also causes of accident. We have designed the drainage blockage detection system to avoid such problems. This system provides monitoring of drainage condition and to inform authorities of these condition. This design present an implementation wireless sensor network in the monitoring of drainage system using GSM system. To detecting blockages and monitoring water level condition we use level sensor. This design consist of GSM module is used to send the messages to central computer and monitors all drainages throughout the area.

Keywords: Include GSM- model, ARM7, Level sensor, IR sensor, Solenoid valve, Pressure sensor.

INTRODUCTION

Control System and automatic Drainage Water of level Monitoring Using ARM7 proposed to overcome the real time problems with continued expansion of industries, from industries of the surrounding environment. As one of the key components of city infrastructures, urban drainage systems are generally networks which carry urban wastewater and rainwater to one or more terminal points, where it is treated and/or discharged to the environment. Combined sewer systems carry rain and wastewater together.[6].The 3.5 year project completed in 2004 includes an online system with 25 rainfall measurements 40 flow measurements and 20 water level measurements; this measuring system is designed to achieve the real-time control and the calibration of model that is used for the hydrodynamic sewer system operation. With Simulation runs of a rule-based control software, the system operation was made. Now a days we have used wireless technologies. Due to increasing drainage problems it is necessary to urgently resolved. Drainage handles liquid waste coming from street , factories and creeks The wastage and gases produced from the industries are very harmful to human beings and to the environment.

Clogging of drainage is measure causes of flooding and pollution. The drainage blockage controlling is necessary to avoid such problems. detection of drainage is routinely required. our system is used for the control and monitoring the drainage blockages. These system has mostly consist of three important parts that is controller is brain of our system ,development of system that can process the data ,modulates the signal and transmit via antenna. This system the research methodology is using GSM network platform, with single-chip microcomputer control technology and wireless network technology as the core, the intelligent information collection ,information processing, to the user service terminals, to realize water level telemetry ,flood control information data sharing purpose.[1] In these system we have used level sensor for measuring water level, IR sensor for blockage detection, Solenoid Valve to provide bypass system for water. Water level observation of flood is an important step based on GSM [8].These proposed system is focused more towards prevention.

BLOCK DIAGRAM

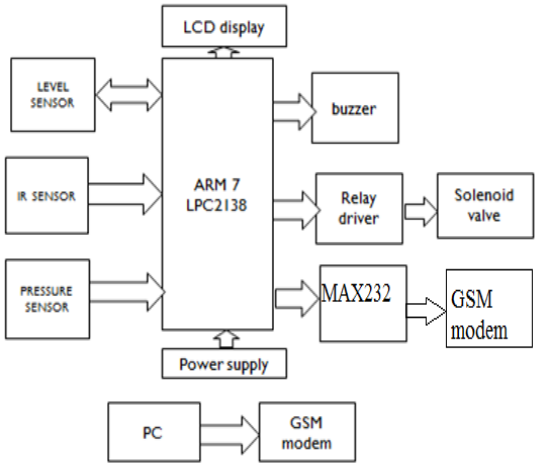


Fig. block diagram

WORKING

In this system we have used level sensor for measuring level of water in drainage. IR sensor is used for blockage detection. For temporary control of water level we provide bypass system by using solenoid valve.If level of water goes above the predetermined limit then solenoid valve is open and buzzer gives indication.We have used wireless system in that we used GSM modem which is used for sending message to the authorities relative the water levels.

Level Sensor :

For measuring level of water in these system we have used conducting metal strip.the whole thing depends on principle of electrical conducting property of water. when

IARJSET
ISSN (Online) 2393-8021
ISSN (Print) 2394-1588
International Advanced Research Journal in Science, Engineering and Technology
Vol. 3, Issue 4, April 2016

signal sensed by level sensor it is fed to microcontroller for further action.

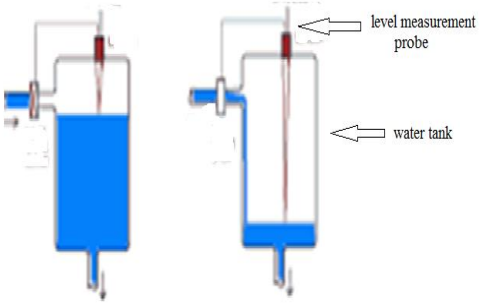


Fig. Level Sensor

IR Sensor:

It is used to detect presence of object or obstacle in Drainage pipe. Normally, light from the IR led keep falling on the IR sensor continuously and thus the IR offers a low resistance. Whenever there is obstacle between LED and sensor output goes low which turn off the next transistor .Its collector voltage is applied to inverter IC. Double inversion is done with 7404 IC.

The output of second inverter gate is applied to the base of transistor which drives it into conduction. Transistor collector current will flow from relay coil, which will turn on the sv by connecting 24v dc supply to it. As soon as transistor is in saturation, collector current will flow from relay coil. Relay coil will be in energized condition, which will change contact from NC to NO. 24V is applied to SV or No contact of the relay. LED1 at collector of transistor will turn on to indicate the status of SV. The diode in parallel with coil will act as a freewheeling diode to dissipate the stored energy across coil.

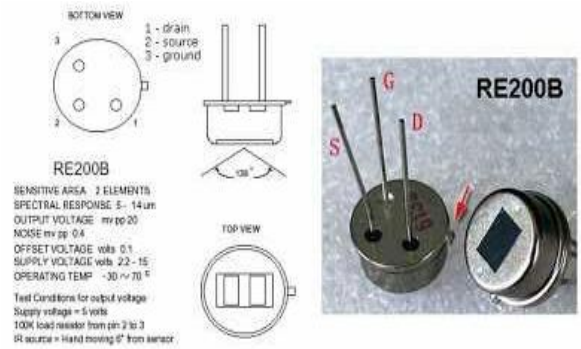


Fig. IR Sensor

LCD Display:

We had used 16 *2 Liquid crystal display. For display level of water.

Features:

16*2 display
Supply voltage 7 v
1/16 duty cycle
5 x 8 dots with cursor
Built-in controller

Solenoid valve :

If water level goes to above predetermined level then for controlling purpose we have used bypass system .for that we have used solenoid valve which has one inlet & other is outlet valve.

Fig. solenoid valve

LPC2138:

In this system we have used most popular & widely used controller i.e.ARM7 (LPC 2138) .Which has tiny size and low power consumption.

Features:

The ARM7TDMI-S is a general purpose 32-bit microprocessor.
very low power consumption and high performance
Power supply pin can be connected to a battery or the main 3.3V.
The LPC2138 incorporate a 32 kB flash memory system .
The LPC2138 provide 8 k of static RAM
Multi Master bus
32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 or HVQFN package.
Power saving modes include Idle and Power-down.

GSM Model :

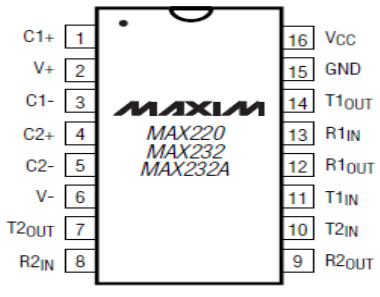
Our system is wireless based so we have used SIM 900 GSM modem. this modem is globally accessed by 212 countries. which is used sending message to authorites when water level goes to above the predefined limit .

Features:

Good subjective speech quality.
Low terminal and service cost.
Supports for international roaming.
It has range of new facilities and services.

MAX232:

RS232 (Recommended standard-232) is a standard interface approved by the Electronics Industries Association (EIA) for connecting serial devices.



DIP/SO

CAPACITANCE (µF)					
DEVICE	C1	C2	C3	C4	C5
MAX220	4.7	4.7	10	10	4.7
MAX232	1.0	1.0	1.0	1.0	1.0
MAX232A	0.1	0.1	0.1	0.1	0.1

Fig.MAX232

DOI 10.17148/IARJSET.2016.3416

IARJSET
ISSN (Online) 2393-8021
ISSN (Print) 2394-1588
International Advanced Research Journal in Science, Engineering and Technology
Vol. 3, Issue 4, April 2016

Relay :
Relay is used to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuit).

Buzzer:
The indicating devices used in drainage system is buzzer. This gives information about the level increased above the predefined limit. A buzzer is an electromechanical device which isused for anaudio signalling purpose. It Alert the authorities.

ADVANTAGES

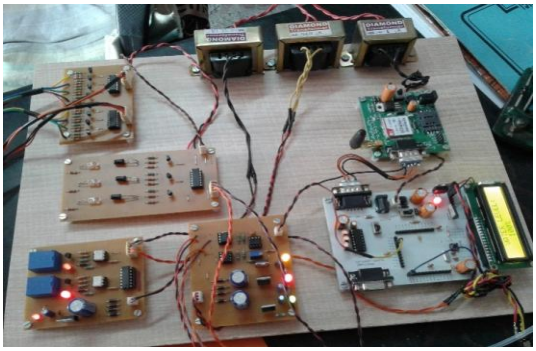
1. GSM based user-friendly interfacing.
2. Low power consumption.
3. Long life.
4. Highly flexible.
5. Low cost:

APPLICATION

1. For industry & commercial use: From industries and commercials for industrial applications in the proper disposal of sewages are still a challenging task. Drainage pipes are using for the disposal while cleaning the blockages in the drainage pipes to solve this problem we can use such system sometimes there may be loss of human life.
2. These system used in DAM.
3. Also for home & official use.

RESULT

From this project we got information related to the blockage of drainage, pressure& level of water .in this way we can detect blockage of drainage & control this.



CONCLUSION

In this System we have explained about the design of a cost effective easy method to control the water level of the tank wirelessly and automatically. As per our design it is best implementable for houses and offices. In this system by using level & IR sensors we can monitoring & control the drainage blockage.Also in this system we are using solenoid valve for bypass purpose. From that, we can prevent the breakage of pipe, avoid chances of flood And also prevent the pollution. In this way our system helps to create good environment & save the human life.

REFERENCES

[1] LiuJinHuaGaoGongLiang.Based on G S M of groundwater level and rainfall on-line monitoring system [J].Automation technology and application, 2007, 6 (I) • 28-29.
[2] JIANG Jing, ZHANG Xuesong, Campus sewage treatment based on program logic control. 978-1-4577-2074-1/12/$26.00_c 2012 IEEE
[3] Wang Juan, Wireless Real-time Observation System for Water Level of Urban Drainage. DOI 10.1109/ICMTMA.2011.858
[4] S. M. Khaled Reza., Shah Ahsanuzzaman Md. Tariq., and S.M. Mohsin Reza., "Microcontroller Based Automated Water Level Sensing and Controlling: Design and Implementation Issue", Proceedings of the World Congress on Engineering and Computer Science, Vol 1, pp.1-7, 2010
[5] MelatyAmirruddin., Nurhakimah M. Mukhtar., Hana A. Halim., and Nur S. Noorpi., "Microcontroller Based Water Level Indicator Using GSM Modem: Design and Application", 1st International Conference on Future Trends in Computing and Communication Technologies, pp.79-83, 2012.
[6] Yan Xijun., Lu Limei., and XuLizhong., "The Application of Wireless Sensor Network In the Irrigation Area Automatic System", International Conference on Networks Security, Wireless Communications and Trusted Computing, Vol.1, pp.21-24, 2009.
[7] Christian Reinisch., Wolfgang Kastner., Georg Neugschwandtner., and Wolfgang Granzer., "Wireless Technologies in Home and Building Automation", 5th IEEE international conference on Industrial Informatics, Vol. 1, pp.93-98, 2007
[8] Y unpengLiu., and Chen yang., "Based on GSM Network of Intelligent Telemetry Water System", International Conference on Electronics and Optoelectronics, Vol.2, pp.220-222, 20
[9] Wireless Real-time System for Monitoring the Storage of Urban Storm Drainage,YinHailongXuZuxin, DOI 10.1109/NCIS.2011.18711.

BIOGRAPHIES

Prof. Sachin D Anap, has completed his M.E.(Electronics and Telecommunication) & B.E. (Electronics and Telecommunication). He is working as a Assistant Professor in Electronics Department, Pravara Rural Engineering College, Loni, Dist. Ahmednagar, Maharashtra, India. Prof.S.D.Anap has teaching experience of 08 yearsto Graduate Students. Prof.S.D.Anap has Published 07 papers in International Journal, 01 paper in National Journal & presented 03 papers in National Conference.

Ms. Dengale Rani V. studied in BE(Electronics) in Pravara Rural Engineering College, Loni, Dist.-Ahmednagar, Maharashtra, India. Loni, Dist.-Ahmednagar, Maharashtra, India.

Ms.Ghule Suvrana U. studied in BE(Electronics) in Pravara Rural Engineering College, Loni, Dist.-Ahmednagar, Maharashtra, India

Ms.Jadhav Shradha B. studied in BE(Electronics) in Pravara Rural Engineering College Loni, Dist.-Ahmednagar, Maharashtra, India.