



Android Based Fault Detection System in Industry

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ABSTRACT: Now a day, automation is a major part in the industry. Human efforts are reduced using the automation system which monitors and indicates any fault in the system as per program. Here we suggest a similar automation system which will be used in industry for monitoring various parameters such as temperature, humidity gas and fire. We use different sensor to monitor and detect the fault. These are connected to the PIC controller and PIC controller is interfaced to android application. We use a Bluetooth module to communicate PIC controller with android app. We provide a real time continuous monitoring of the parameters on the android display. If any parameter goes above the set threshold the system indicates it through and sends SMS to the respective authorities.

KEYWORDS: PIC16f877 Microcontroller, Sensors, ULN2803 (Device Driver), Android Operating System, Bluetooth device, Controlling Device.

I. INTRODUCTION

Safety and security is most importance for anything which we have in our daily life, especially in the industry prevents the explosion of gases. In our industry sector there is more fault occur therefore our industry sector most problem face people therefore wastage of time ,wastage of money and industry production are reduces. We use different sensor to monitor and detect the fault. These are connected to the PIC controller and PIC controller is interfaced to android application.

This method is simple, convenient and penetrating, with lower cost and higher accuracy. This project has 4 sensors. These four sensors are LPG gas sensor to detect the gas leakage, Temperature sensor for overheats detection and fire sensor to detect fire and we use the humidity sensor. If any fault is detected then basic device turned on and SMS is sent. ANROID MODULE is used to send the SMS whenever there are any fault occurs.

II. RELATED WORK

The system is equipped with a GSM modem to send and receive text message (SMS) and relay board to control electronic equipment. The system raises an alarm and send an alert message to administrator when the room temperature is above threshold, which is 28°C [1]

As per previous research papers GSM based Industrial security system use PIR sensor, Gas sensor and Smoke sensor And Main fuse Failure Detector at Home & Industries .The system is fully controlled by the micro-controller and the micro-controllers will continuously monitors the sensors, detector and GSM modem will send the type of problem to user.[3]

The system uses GSM technology and 8051 Microcontroller. This work includes the study of GSM modem using sensors. GSM network operators have roaming facilities.[4]



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III. PROPOSED ALGORITHM

A. DESIGN CONSIDERATIONS

1. Start.
2. Initialize ADC and UART of PIC controller.
3. Initialize Bluetooth module.
4. Connect Bluetooth module to hardware.
5. Press start button on android app.
6. Controller will start reading sensor values.
7. Send to android app and display on android.
8. If sensor values is greater than threshold send SMS.
9. And start the output devices.
10. Repeat step 6.

B. DESCRIPTION:

Android is an open source and Linux-based Operating System for mobile devices such as smartphones and tablet computers. Android was developed by the Open Handset Alliance, led by Google, and other companies. Android offers a unified approach to application development for mobile devices which means developers need to develop only for Android, and their applications should be able to run on different devices powered by Android.



Fig. 1

ANDROID STUDIO

Steps

1. Start a new android studio project
2. android studio and create the new project
 - a] Application name
 - b] Company name
 - c] Package location and locate selector
 - d] And next step selected
3. Target android devices
 - a] Selected form factor your app will run on
 - b] Phone and tablet minimum SD
 - c] Wear
 - d] TV
 - e] Android auto selected



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- f] Next
- 4. Add activity to mobile
 - a] Add no activity to mobile
 - b] Blank activity
 - c] Empty activity
 - d] Full screen activity
 - e] Google admobadc activity
 - f] Google map activity
 - g] Login activity
 - h] Master/detail flow
 - I] scrolling activity
 - j] Next
- 5. In my application main window occurring selected app
 - a] Manifest
 - b] Java in main activity program
 - c] Types the program types and the layout checking
 - d] Then check the output

IV. SIMULATION RESULTS

This project is a combination of hardware system and android application. Hardware and android communicate using Bluetooth module. At hardware side we use a Bluetooth module and the in-built Bluetooth of Android cell is used. In this to build the android app we use android studio software. Android app GUI indicates the values of parameters. It will have a start and stop buttons to turn on and turn off the basic devices. When we press the start button on the GUI internal timer starts and the android app connects with the hardware Bluetooth and sends command to the read each all sensor. Two sensors provide analog values which are temperature and humidity. The digital value gives gas and fire sensors. If all the sensor exceed their range then automatically value displayed on android application this application can be turned on basic device.

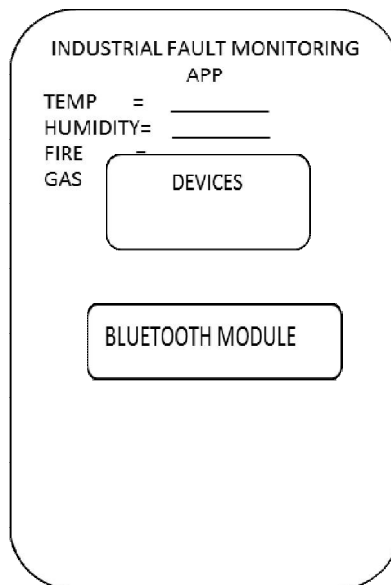


Fig. 2

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For designing this system here we use Temperature sensor, Gas sensor, Fire sensor humidity sensor, PIC Micro controller, Power supply, android based mobile etc. By using this project we detect the fault occurred in the industry.

In the industry no immediate action taken by authorized person on the fault, so that in this project by using GSM facility we will send the message instantly to respective authority. At that place this project is very useful. This system easily fault detected above parameter exceed the parameter then priority based fault detected and automatically send the message to the 3-4 managers in the Industries, primary based solution we are using fan, and water spray, this devices are automatically turn on . In industry many fault occurs because of the parameters exceed their range here, we are using LM35 as a temperature sensor to detect the temperature. This sensor will measure the room temperature and if the temperature increases above a fixed value it will be displayed on android operating system. Gas leakage in the room

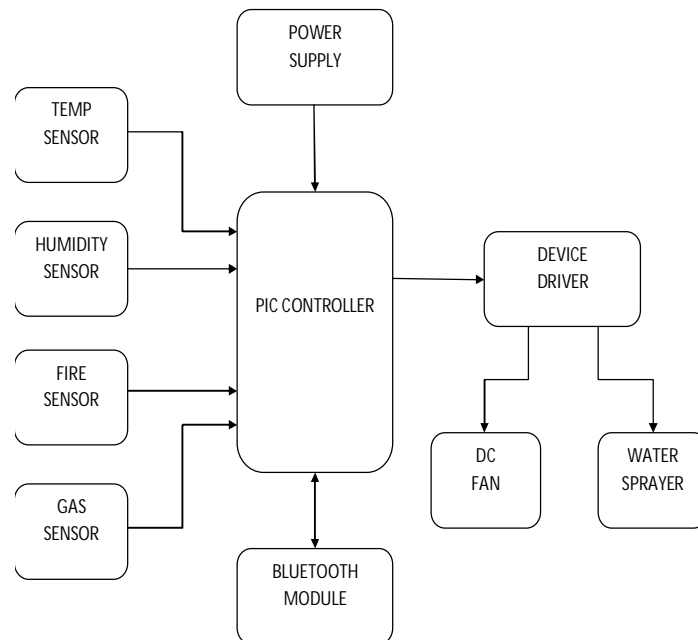


Fig. 3

it will signal to the micro controller and system alert will be started are using gas sensor. So that everybody working in the area would know the danger. We are also use a fire sensor which would detect the fire and indicate it to the system. Here we use the humidity sensor which detected humidity in industry sector, using android operating system we make one application and this stored the data and information send through message to the manager automatically and basic device turned on easily.

V. CONCLUSION AND FUTURE WORK

This system is for measure the parameters values and to detect the fault in the industries. If fault occurred we take immediate action on it hence this system increases the security of industry and the peoples who work in the industry. It is also use in the smart kitchen.

1. We can connect to net through Wi-Fi and observe this data in remote location.
2. We can increase no of sensor which we require.
3. This system we can display the values server to other server uploading using IOT.



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REFERENCES

- [1]Theophilus Wellem ,Bhudi Setiawan,' A Microcontroller- based Room Temperature Monitoring System' *International Journal of Computer Applications (0975 – 8887) Volume 53– No.1, September 2012*
- [2]Ashish Shrivastava, Ratnesh Prabhaker, Rajeev Kumar and Rahul Verma,'GSM BASED GAS LEAKAGE DETECTION SYSTEM', *International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 1, Issue 2 (may-june 2013), PP. 42-4*
- [3] 1M.Sravan Kumar, 2M.Mounika, 3L.Ramya Pavani, 4E.Ranadeep, 5 B.Siddhartha 6K.B.V.S.R.Subramanyam ' GSM BASED INDUSTRIAL SECURITY SYSTEM '1, 2,3,4,5 B.E Students, 6Associate Professor, SR Engineering College, INTERNATIONAL JOURNAL OF CURRENT ENGINEERING AND SCIENTIFIC RESEARCH (IJCESR) ISSUE-5, 2015
- [4] Aishvarya Kumar Sharma¹, Kushagra Kumar Choubey², Mousam Sharma³' INDUSTRIAL AUTOMATION USING 8051 MICROCONTROLLER' Address for Correspondence 1,2B.E.Scholar, 3Assistant Professor, IEEE Dept., BIT, Durg, (C.G.), India
- [5]J. G. Gajipara and prof. K. A. sanagara, 'Stepper motor driver for high speed control by high voltage and constant Current', in *of IEEE International Journal of advanced engineering and studies*, vol. 1, pp. 178-180, 2012.
- [6] A. Jain, D. kumar and J. Kedia, 'Design and development of GSM based energy Meter', *International Journal of Computer Application*, vol. 47, no. 12, June 2012.
- [7] HongLi Zhu and LiYuan Bai. 'Temperature monitoring system based on AT89C51 microcontroller.' In IEEE International Symposium on IT in Medicine Education. ITIME (August 2009), volume 1, 316-320.
- [8] T.O. Loup, M. Torres, F.M. Milian, and P.E. Ambrosio. 2011. Bluetooth embedded system for room-safe temperature monitoring. *Latin America Transactions, IEEE (Revista IEEE America Latina)* (October 2011), 9(6):911-915.
- [9]H. Robinson, 'Obstacles and opportunities for model-based testing in an industrial software environment' ,Proc. 1st European conference on Model-Driven Software Engineering(2003), pp. 118-127, Dec. 2003
- [10] P. M. Franck,' Fault diagnosis in dynamic systems using analytical and knowledge- based redundancy A survey and some new results', *Automatica*, vol. 26, no.3, pp. 459-474, 1990.
- [11] C.S. Berendsen , G. Rostaing, G. Champenois,' How to detect and localize a fault in DC/DC converter', Proc. IECON92, vol. 1, pp. 536-541, 1992.
- [12] .M. El Hachemi Benbouzid,' a review of induction motors signature analysis as a medium for faults detection' *IEEE Transactions on Industrial Electronics* (Volume: 47, Issue: 5, Oct 2000) Page(s):984 - 993 Date of Publication: 06 August 2002
- [13] D. J. T. Siyambalapatiya, "Reliability improvement and economic benefits of on-line monitoring system for large induction machines", *IEEE Trans. Ind. Applicat.*, vol. 26, pp. 1018-1025, July/Aug. 1990.
- [14] F. M. Discenzo, "Motor diagnostics: Technological drivers leading to 21st century predictive diagnostics", Proc. 1997 Int. Conf. Maintenance and Reliability, vol. 1, pp. 30.01-30.12.
- [15] A. H. Bonnett, "Cause and analysis of stator and rotor failures in three-phase squirrel-cage induction motors", *IEEE Trans. Ind. Applicat.*, vol. 28, pp. 921-937, July/Aug. 1992.