

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES AN EFFECTIVE WIRELESS SOLUTION FOR INDUSTRIAL AUTOMATION BY USING RASPBERRY PI

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ABSTRACT

Theoretical-Embedded web server is the blend of inserted gadgets and web innovation. This paper is centered around advancement of installed web server in view of Raspberry Pi for the correspondence in computerization.. For compelling planning and actualizing a framework we utilize raspberry pi innovation. This raspberry pi innovation alongside Cloud makes the framework Accessible from anyplace on the planet. Different sensors are interfaced with microcontroller. Parameters like Light, weight, movement and edge are estimated and continuous detected information is accessible on the remote pc. Because of the utilization of raspberry pi innovation we can accomplish super speed transmission of huge measure of information in less time. Along these lines Proper utilization of remote sensor systems (WSNs) brings down the rate of disappointments, general cost of the framework, and builds the profitability, effectiveness of general mechanical tasks.

Keywords: Raspberry pi, Fire Sensor, Gas sensor, Embedded sever, Buzzer.

I. INTRODUCTION

Remote Correspondence Is Critical Idea And It Assumes An Essential Part In Different Ventures Of Mechanization Field. Today The Use Of Remote Correspondence In Mechanical Mechanization Is Expanding Quickly As In. Information Obtaining Frameworks With Remote Availability Are In Awesome Request In Industry And Shopper Applications . In A few Applications People Have Been Supplanted By Unmanned Gadgets That Will Gain Information And Transfer The Information Back To The Base. A Solitary Individual Can Screen And Even Communicate With The Continuous Work From A Solitary Base Station. Remote Based Modern Mechanization Is A Prime Worry In Our Everyday Life. The Way to deal with Remote System For Modern Applications institutionalized these days. Wise and minimal effort mechanization of mechanical procedures are vital to enhance process efficiencies, convey quality items, and guarantee convenience and precision of framework . Remote is anticipated to be one of the quickest developing advances in the territory of process mechanization part. The installed web server arrange comprises of cutting edge processor ARM11-Raspberry Pi. It is having RISC engineering. An inserted web server makes a simple path for observing and controlling any gadget which is at remote place . For planning the framework we require remote pc alongside the web office at the remote areas. We actualize a framework which is compact, minimal effort and having less support by utilizing GPRS innovation. GSM (Worldwide Administration for Portable Correspondence) arrange has in-constructed intense TCP/IP convention stack for web information exchange over GPRS innovation. In this way the status of various sensors introduced at working spot is observed at anyplace on the planet. The announcing of this ongoing information comparing to the procedure plants is subsequently be of awesome use for future examination.

II. PROBLEM FORMULATION

Existing approach doesn't have any automated methods where we can control the industrial devices remotely using web server, everything is manual process it may lead to lot of resource wastage. Because of lot of manual work is involved every time we should keep monitor devices and their status to maintain devices condition.

III. SYSTEM DESIGN

The multi-center installed sensor hub comprises of a detecting unit, a preparing unit, a capacity unit, a correspondence unit, a power unit, a discretionary actuator unit, and a discretionary area finding. The industrial automation system consists of two modules, embedded main board and the base station. The embedded main board module designed with the help of ARM microcontroller and the processor is programmed with the embedded c language. The embedded main board module consists of Raspberry pi which is interfaced with the gas and temperature sensors, solar panel, buzzer, ADC circuit and current measurement unit. Basically this module be kept at the industrial site which measures the boiler temperature and senses the presence of hazardous gases. The system provokes alarm during the critical situations

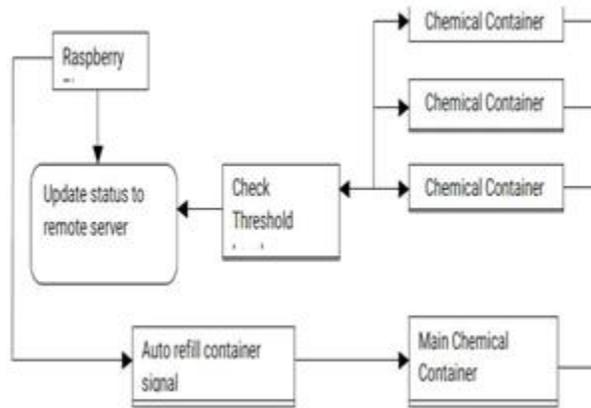


Fig. 1. Block Diagram of the Proposed System

A .Over view of system design

In our paper we are mainly concentrate on industrial automation here we are going provide sensors for chemical containers when threshold level is low in sub containers chemical is going to fill automatically and when it reaches to high level filling is automatically stop. Temperature sensor is used to detect the fire gas sensor is used to detect the leakage of gas and we are going to maintain the automatic employee entrance and exit of the company.

B. Temperature Sensor (LM35)



Fig2. Temperature Sensor (LM35)

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The LM35 course of action are precision joined circuit temperature sensors, whose yield voltage is specifically comparing to the Celsius (Centigrade) temperature. The LM35 accordingly has great position over direct temperature sensor balanced in ° Kelvin, as the customer isn't required to subtract an extensive reliable voltage from its respect secure accommodating Centigrade scaling. The LM35 does not require any external arrangement or trimming to give standard correctnesses of $\pm 1/4^{\circ}\text{C}$ at room temperature and $\pm 3/4^{\circ}\text{C}$ over a full -55 to $+150^{\circ}\text{C}$ temperature broaden. Insignificant exertion is ensured by trimming and arrangement at the wafer level. The LM35's low yield impedance, coordinate yield, and correct inborn arrangement make interfacing to readout or control equipment especially straightforward. It can be used with single power supplies, or with notwithstanding and short supplies. As it draws only $60\ \mu\text{A}$ from its supply, it has low self -warming, under 0.1°C in still air. The LM35 is assessed to work over a -55° to $+150^{\circ}\text{C}$ temperature run, while the LM35C is assessed for a -40° to $+110^{\circ}\text{C}$ region (-10° with upgraded precision).

C. Gas Sensor (MQ3)



Fig3. Gas Sensor

Delicate material of MQ-3 gas sensor is SnO_2 , which with bring down conductivity in clean air. At the point when the objective liquor gas exist, The sensor's conductivity is more higher alongside the gas fixation rising. It would be ideal if you utilize straightforward electro circuit, Change over difference in conductivity to compare yield flag of gas focus. MQ-3 gas sensor has high sensitivity to Liquor, and has great protection from irritate of fuel, smoke and vapor. The sensor could be utilized to recognize liquor with various focus, it is with ease and appropriate for various application

D. Buzzer

The buzzer is interfaced with the Raspberry pi, which provokes an alarm during hike in boiler temperature and also during the detection of presence of hazardous gases. The shows the circuit diagram of the buzzer

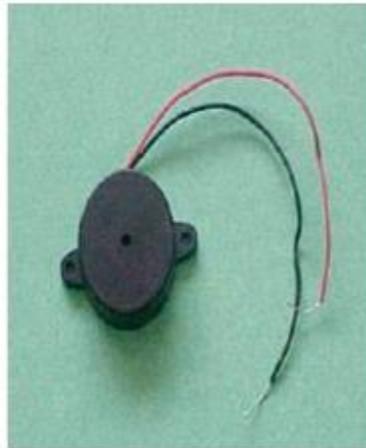


Fig.4. Buzzer

in the overhead tank and also in other containers. The capacitor is used for electrical noise and the function to keep the alarm once fire or gas is detected. Which turns off the transistor, turning the buzzer off. The water level alarm circuit is a simple mechanism to detect and indicate the level of water

IV. IMPLEMENTAION

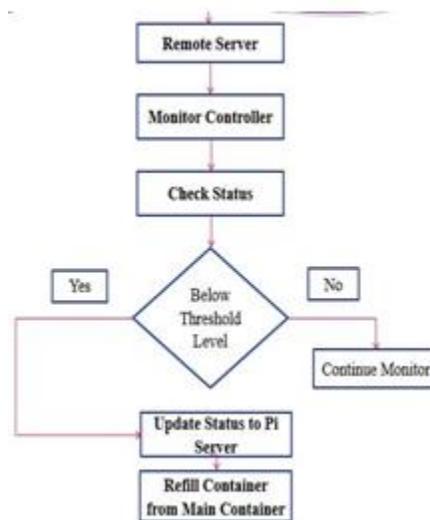


Fig 5. Data flow diagram

In this paper we are mainly concentrating on chemical container auto fill controlling process. Here chemical mixture from the main container will fill automatically to its sub container when the chemical mixture reaches to below threshold level in sub container. On that time threshold level indicating sensor will intimate or update the current status to raspberry pi through the remote server that chemical is in below the level. After receiving the signal from sensor raspberry pi will send the start signal to motors to fill the sub containers. When the chemical mixtures reaches to high threshold level sensors will update the level position, then raspberry pi will sends the stop signal to motors to stop the filling process. Like this our project design will move on.

V. CONCLUSION

By introducing IOT in industrial applications we can make all industrial process as automatic. In this project we are mainly concentrating about automation on chemical containers to fill automatically and to control other devices also web-server application helps to work automatic using internet connections

REFERENCES

1. CheahWai Zhao, CheahWai Zhao, Son Chee Loon, “Exploring IOT application using raspberry pi”, *International Journal of Computer Networks and Applications*, Vol. 2, Issue 1, pp. 27-34, February 2015.
2. S.Thenmozhi, M.M.Dhivya, R.Sudharsan, K.Nirmalakumari, “Greenhouse Management Using Embedded System and Zigbee Technology”, *International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (An ISO 3297:2007 Certified Organization)*, Vol. 3, Issue 2, ISSN (Print) : 2320 –3765, ISSN (Online): 2278 – 8875, pp7382-7389, February 2014.
3. Ron Oommen Thomas, K. Rajasekaran, “Remote control of robotic arm using raspberry pi”, *International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353*, Vol. 8, Issue 1, pp186-189, April 2014 [4]. Xiangdongcai, Guangweiyang and Xiaoqingzhang, “Design of fan performance detection system based on arm embedded system”, *International Journal of Smart Home*, vol.8, no.1, pp.311-316, ISSN:1975-4094, 2014.
4. V. PersisPriyanka, K. Sudhakar Reddy, “Identifying The Changes Through Pir By Transmitting The Video And Providing A Security”, *International journal of professional engineering studies*, vol. 5, Issue 1, pp. 71-76, June 2015