

IoT based Industrial Controlling System using web page and Android application

¹Pratibha Lagad, ²Sanjay Patil

¹P.G. Student, ²Associate Professor

Department of electronics and telecommunication.

D.Y. Patil College of engineering and technology, Kolhapur, India

Abstract: The concepts of Internet of Things (IoT) are applied to a number of applications ranging from home automation to industrial IoT, where connecting physical things from anywhere through a network. These things take an active part in the Internet, exchanging information about themselves and their surroundings. This will give immediate access to information about the physical world and the objects in it leading to innovative services and increase in efficiency and productivity. The proposal of system is to develop an IoT based industrial controlling system using SMS & E-mail alert. This device is essential for sensor data collection in the Internet of Things (IoT) environment. It is planned to style a re-configurable sensible device interface for industry in IoT atmosphere, during which ARM is adopted as the core controller. Thus, it will scan information in parallel and in real time with high speed on multiple completely different device information. Intelligent device interface specification is adopted for this style. The device is combined with the most recent ARM programmable technology and intelligent device specification. By detecting the values of sensors, it can easily detect the Temperature, Smoke, and Fire present in the industrial environment and we can handle any situation from anywhere in the world through IoT. So that critical situation can be avoided and preventive measures are successfully implemented.

Index Terms: Internet of things, ARM controller, Industrial Controlling, Temperature, Fire, Smoke.

I. INTRODUCTION

Technological developments have enabled to be taken classic systems place by Automatic and advanced systems. In addition, the availability of fast-processing, stable and sensitive products provided particular benefits in industrial automation. As a result of the developments in Communication technologies, systems are no longer monitored and controlled by personnel using classic methods, but automatically by computer-controlled or remote-controlled devices. Industrial environmental conditions have been upgrading day by day with this newly introduced automatic techniques as a result of getting rid of the conventional procedures of manufacturing increasing huge workloads. The next generation industries will be definitely more advanced and automatic as compared with existing ones. This brings on a new terminology of "Smart Industries" in this new era of Monitoring as well as controlling of various Industrial applications. As an emerging technology brought about rapid advances in modern wireless telecommunication, Internet of Things (IoT) has attracted a lot of attention and is expected to bring benefits to numerous applications. The newly introduced concept of "Internet of Things" (IOT) is providing a helping hand to achieve the Industrial automation through remote access. In IOT each device or devices constituting a system will be able to communicate with the other devices or system in the same premises over a common platform. Hence this leads to exchange of relevant data, statistics, logs and various other parameters information among various devices to improve their performance, which will help industries to have better productivity, management and increased throughput.

The Embedded systems are electronic devices that incorporate microcontroller with in their implementations. The main purpose of the microcontroller is to simplify the system design and provide flexibility. Having microcontroller in the device means that removing the bugs, making modifications, or adding new features are only matters of rewriting the software that controls the device or in other words embedded computer. Internet systems are electronic systems that include a microcomputer to perform specific dedicated applications.

Internet of Things (IoT) has attracted a lot of attention and it is expected to bring benefits to numerous application areas including industrial systems.

II. PROPOSED WORK

A. Block Diagram –

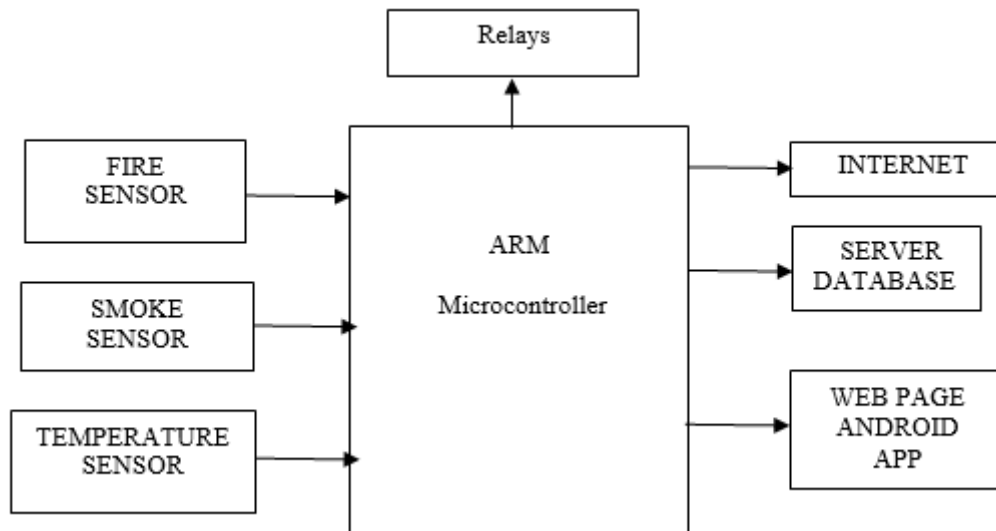


Fig 1: Block diagram of proposed system

The proposed work is related to implementation of system which consists of industrial controlling. The proposed system is mainly based on the values of the sensors (temperature, fire & smoke). By detecting the values, controller can easily find out the smoke, temperature and fire present in industrial environment. These values are continuously monitored by the controller and stored on the server.

For alert system we are using SMS and E-mail alert. If there are any changes in temperature, smoke or fire we get instantaneous information from the site through automatic generated mail and SMS.

The proposed system for Industrial Controlling consists of the ARM controller, web page and android app. The main objective is to control the electrical appliances and machines used in the industry. The microcontroller is interfaced with sensors to sense the conditions. The measured sensor values of the plant or industry are sent to the controller. The measured sensor values from the sensors are compared with the threshold values in the controller and then sent to the Internet.

These values are stored in the database of the server and displayed on the web Page and android app. If there are any changes in temperature, smoke or fire we get instantaneous information from the site through automatic generated mail and SMS. The web page displays the status as emergency. The microcontroller is interfaced with relays and they can be turned on/off using the information from the web page and android app.

B. Algorithm-

The algorithm for industrial controlling is as follows:

1. Start
2. Initialized the port
3. Receive input from sensor.
4. If sensors detect any hazard and accident, then send SMS and e-mail alert.
5. If sensors do not detect any hazards, it will go back and continuously check and display the sensor value.
6. From the status of web page and android app we can control the device from anywhere.

III. PERFORMANCE EVALUATION-

The following fig. shows the status of parameters displayed on the web page and android app.

Fig 2. Shows the various options on android app. and the status of parameters (Temperature, fire, smoke)

Fig3. Shows the web page contents displaying the emergency status.

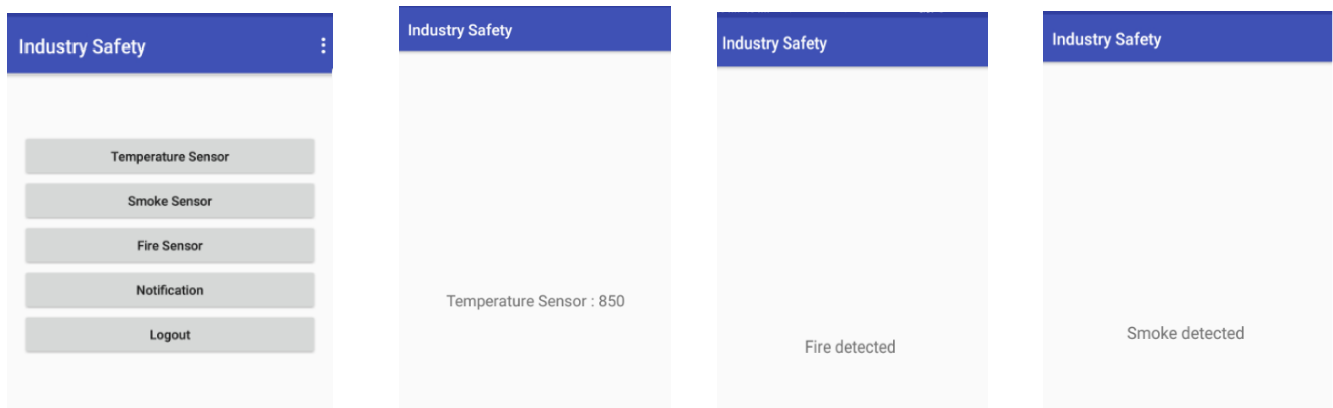


Fig 2: android app screen displaying status of parameters



Fig 3: web page

III. CONCLUSION

This paper represents an industrial controlling solution based on providing intelligence using an IoT prototype with sensors. It can read, collect, and transmit huge volume of data over the Internet. Such data can be used to dynamically manage various industrial processes. The key idea of the proposed work is to provide flexible and long-distance connectivity between industrial environment and user. The advantages of the developed system are to have a continuous monitoring over industrial applications and also control them if going beyond their threshold conditions. Future work will focus on improvement of above proposed work and adding features to make a reliable smart Industrial monitoring and controlling system. It is responsible for measuring the values of the sensors (temperature, fire & smoke). By detecting the values controller can easily find out the temperature, smoke and fire present in industrial environment. These values are continuously monitored by the controller and stored on the server.

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AUTHOR'S BIOGRAPHY

1. Pratibha D. Lagad has completed B. E. in Electronics Engineering from D. Y. Patil College of Engineering & Technology, Shivaji University, Kolhapur, Maharashtra, India. She is pursuing M.E. in Electronics & Telecommunication Engineering from DYPCET, Kolhapur. Her research interests are Internet of Things (IoT), Industrial Automation & Embedded Systems.



2. Prof. Mr. S. B. Patil has pursued M.E. in Electronics Engineering with specialization in Embedded Systems. He is working as Associate Professor in D. Y. Patil College of Engineering & Technology, Kolhapur

