Environmental Parameters In Industries Is Monitoring Through PC Using Wireless Data Transfer

Deepak Mewara[1]. Bhanu Pratap Singh[2] and Mukul Joshi[3]

[1]*Department of Electrical Engineering, JNU,*
[2]*Department of Electrical Engineering, JIET*
[3]*Department of Mechanical Engineering, JNU,*
dkm1991.dm@gmail.com, bhanurathore32@gmail.com

Abstract— **Remote Monitoring, and Control is one of the most important and necessary criteria for increasing production and process plant availability. There is lot of development in industry and the requirement for industrial monitoring system is getting higher. System should be able to acquire, save, analyze, and process real time data. It is also required controlling particular machines, to change related environment factors and monitoring in long distance so that it realizes modern, intelligent and accurate control. Advantages can be achieved by the substitution of arduino to realize data acquisition and control (DACS). This DACS system measures the remote signals and controls the remote devices through reliable protocols and communication network as a web server. In addition or expanding this project of that a GSM Mobile Communication will help to providing information about related parameter to the system when web server is not available to client.**

I. INTRODUCTION

With the development of modern industry, the requirement for industrial monitoring system is getting higher. The system is required to be able to acquire, save, analyze, and process data. It is also required controlling related instruments to change those environment factors and monitoring in long distance so that it realizes modern, intelligent, and accurate control. In this paper, we propose a Zigbee-based portable low-cost data-acquisition system, which can establish a reliable bidirectional connection for data-acquisition. The application of Zigbee and embedded technology makes the remote monitoring possible and give the stability, reliability, security and real time of the data transmission. It will effectively improve the scalability and maintainability of the control system and reduce cost of the equipment maintenance. Automation is achieved by various means such mechanical, hydraulic, pneumatic, electrical, electronics and computers. The biggest benefit of automation is that it saves labor however it is also used to save energy and materials and to improve quality, accuracy and precision. The primary aim of the proposed work is to design, develop and implement automation in the some section of the spinning mill. In this system using of some sensors like smoke sensors, Temperature sensor, and Light sensor, for respectively monitoring the parameters of Temperature, Smoke, and Light. The sensors are interfaced

with Arduino and the production value is calculated. All those measured parameters are displayed in PC and also synced with cloud. To Design a system for collectively controlling monitoring and maintaining various parameters using different sensors in mill. To synchronously calculate and monitor the production rate in Arduino and upload it to the cloud storage as it can be viewed at any time anywhere using Internet of Things Technology. The ability of a company to fully understand the system and realize its great potentials - The speed at which the company can adjust its management strategy to accommodate effective and efficient implementation of the Automation in its system. These two criteria can be met at no additional cost to the company. They only require commitment and strive to do things differently using the exiting qualifications. In addition, continuous appropriate implementation of the Automation System will eventually lead to substantial reduction in personnel involvement.

II. PROPOSED SYSTEM

In this system, the implementation of wireless data transfer application in the industrial automation helps to monitor the overall industrial parameters through a single PC. This reduces the high manpower requirement in the industrial monitoring field and this system provides automatic control of the parameters by wireless data transfer application, in case the sensed value exceeds a fixed value. This system having various sensors such as pressure sensor, temperature sensor and level sensor and are used to sense the parameters. The sensed values are then processed by the microcontroller and are displayed through the respective LCD displays. Finally, with the help of wireless data transfer communication the overall industrial parameters are monitored through a single PC.

Measurement and controlling of electrical appliances through IR remote is interesting and very useful application. This is a standalone project as it can be used by physically challenged as well as old people to turn loads ON/OFF .This system is widely used in industries, offices, Banks, hotels, hospitals, and display boards. This is an interesting project built with wireless communication and Arduino unit. By using this project we can measure electrical parameters like temperature, smoke, light, etc. The

main function of the project is to transfer data from one point to another which is at a distance from each other and the switching of electrical appliances through optical fiber. The data to be transmitted is outputted from the PC itself. Here switching of appliances is concerned, there is a PC at the transmitter end which corresponds to the control of a particular appliance at the receiver end placed at a distant place. The electrical parameters signal is used to drive AC electrical appliances using a combination of wireless communication between hardware and PC. The project is build around AT89S52.It is used for switching the load equipment according to the command signal given by PC from transmitter end the channel of data.
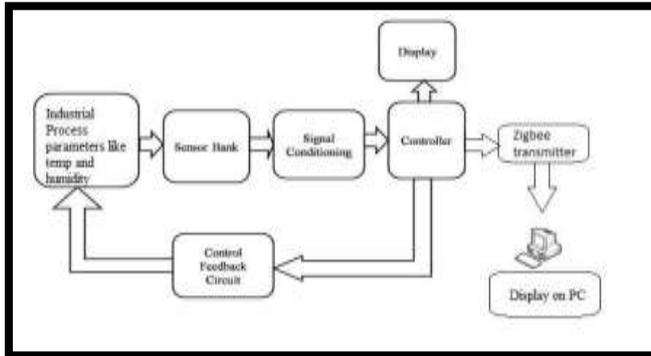
Fig.1- Remote Monitoring & Controlling of Real Time Industrial Parameters through Zigbee Module

Fig1. Shows Block Diagram of the overall system. Humidity, Temperature are taken as a parameter and the sensors concerned to each sensor (Humidity sensor, Temperature sensor) will sense and give output corresponding to the value. This signal is analog in nature, so it is required to convert these analog signals in digital form because microcontroller reads digital signals. For conversion of analog to digital signal, signal conditioner is used. This signal is taken into ARM Microcontroller through the input channel for comparison. This Microcontroller compares the data with its threshold value for any status changes or value crossing the limit. If the value is more than the threshold value, alert the user by making the relay ON, else the relay is in OFF condition. Also, these values send to the computer which is placed on remote place near to the user or authority. Zigbee is used for communication purpose. It has RF waves, which are electromagnetic waves propagate at the speed of light, or 186,000 miles per second (300,000 km/s). The frequencies of RF waves, however, are slower than those of visible light, making RF waves invisible to the human eye. The frequency of a wave is determined by its oscillations or cycles per second .One cycle is one hertz (Hz); 1,000 cycles is 1 kilohertz (KHz); 1 million cycles is 1 megahertz (MHz); and 1 billion cycles is 1gigahertz (GHz). A station on the AM dial at 980, for example, broadcasts using a signal that oscillates 980,000 times per second, or has a frequency of 980 KHz. A station a little further down the dial at 710 broadcasts using a signal that oscillates 710,000 times a second, or has a frequency of 710 KHz. With a slice of the RF pie licensed to each broadcaster, the

RF range can be neatly divided and utilized by multiple parties.

III.   COMPONENTS USED

Following are the components used in this project:
- **Arduino Unit**
- **Temperature sensor**
- **Smoke detector**
- **IR module**
- **Ethernet Shield**
- **Relay driver circuit**
- **Adapter(+12v)**

Arduino: The board features an Atmel ATmega328 microcontroller operating at 5 V with 2Kb of RAM, 32 Kb of flash memory for storing programs and 1 Kb of EEPROM for storing parameters.


Fig-2 Arduino Model

The clock speed is 16 MHz, which translates to about executing about 300,000 lines of C source code per second. The board has 14 digital I/O pins and 6 analog input pins. There is a USB connector for talking to the host computer and a DC power jack for connecting an external 6-20 V power source, for example a 9 V battery.

When running a program while not connected to the host computer. Headers are provided for interfacing to the I/O pins using 22 g solid wire or header connectors. Thus for now we had designed a system for proper controlling monitoring of production and other parameters in spinning mill using IoT.

Temperature Sensor:-
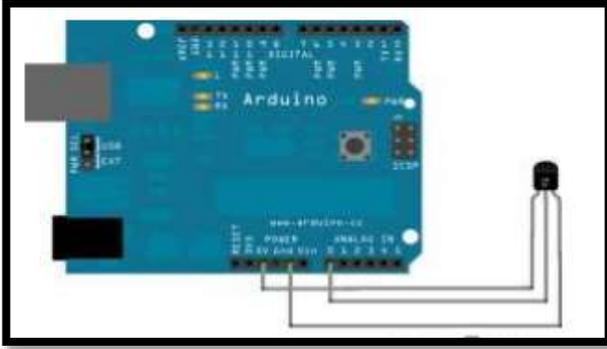
Fig.3- Temperature Sensor

A simple temperature sensor using one LM35 precision Integrated-circuit temperature device with an output voltage linearly-proportional to the centigrade temperature and Arduino. It can measure temperature from -55c to +150c. The voltage output of the LM35 increases 10mV per degree Celsius rise in temperature. LM35 can be operated from a 5V supply and stand by current is less than 60μA.The purpose of this sensor in this system is to monitor the temperature and to regulate Air Cooler system .It is designed that whenever the temperature goes beyond 35° C the Air Cooler system has to turned on. Temperature sensor LM35 is interfaced to the Arduino through the analog input pins Ao and 5V and Gnd from Arduino. Analog pin Ao is set as input and the voltage output of LM35 is coupled to the Arduino. The conversion of Celsius and Fahrenheit is done by certain formula. The output is displayed in the serial monitor. When the temperature goes above 35C the cooler system gets ON automatically. An infrared sensor is an electronic instrument which is used here to detect and count the motion of cones on conveyer. IR sensors are capable of detecting motion of object and heat emitted by an object. IR detectors are specially filtered for Infrared light, they are not good at detecting visible light. On the other hand, photocells are good at detecting yellow/green visible light, not good at IR light.
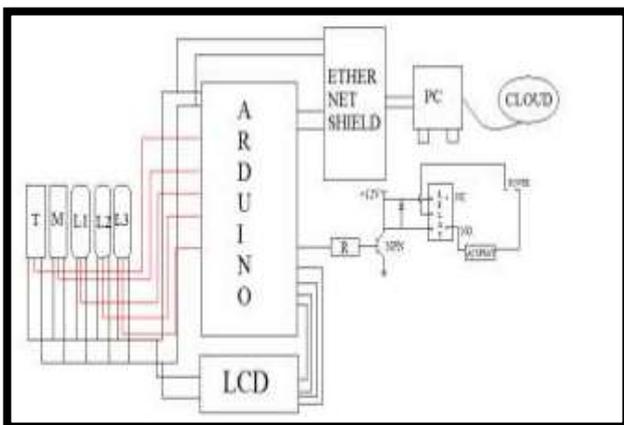
Fig 4- Circuit Diagram

The Internet of Things (IoTs) can be described as connecting everyday objects like smart-phones, Internet TVs, sensors and actuators to the Internet where the devices are intelligently linked together enabling new forms of communication between things and people, and between things themselves. Now anyone, from anytime and anywhere can have connectivity for anything and it is expected that these connections will extend and create an entirely advanced dynamic network of IoTs. IoTs technology can also be applied to create a new concept and wide development space for smart homes to provide intelligence, comfort and to improve the quality of life.

A close connection between things and humans, the cyber world and the physical world, has thus been established via sensors and devices. And that is why the potential for transformation is immense. Every industry will create new business or implement the technology to offer new services to the customers and to increase the quality and performance of the system. In this paper, we extend our previous work and present a low cost and flexible home control and monitoring system using an embedded micro-web server, with IP connectivity for accessing and controlling devices and appliances remotely using Android based Smart phone app. The proposed system does not require a dedicated server PC with respect to similar systems and offers a novel communication protocol to monitor and control the home environment with more than just the switching functionality. In the present work it has been utilized for rest full based Web services as an interoperable application layer that can be directly integrated into other application domains like e-health care services, utility, distribution, or even vehicular area networks (VAN).

IV. WORKING

Initially arduino Ethernet shield is interfaced with arduino properly and Ethernet LAN cable is connected with Ethernet shield in this IoT project we are going to control the home appliances through the android application called "Blink". This app is available in Google playstore. After installing that app in our phone we need to create an individual account by using our mail ID. Then we need to create a new project. After creating the project it will generate a unique key, this key will further used in arduino programming to interconnect a mobile app with arduino Ethernet shield. Then we want to download the Blink library in arduino home page. Then it is added to the arduino IDE. There are so many programs available in that file, but we need only Ethernet program. On clicking that program, we need to replace the token with that unique key generated by Blynk app. This app consists of 3 modules which are used to represent the input stock value, Lap weight count, Output number value respectively.

Figure 5.1: Circuit Connection

Figure 5.2 (a) Arduino transmitter (b) arduino receiver with

USB connection

V. RESULTS

Case 1: In the figure shown below, the project detects the variations in the temperature of the environment.

Figure 5.3 Variation in the temperature

Case 2: In the figure shown below, the project detects the variations in the light intensity of the environment.

Figure 5.4 Variation in the light intensity

Case 3: In the figure shown below, the project detects the smoke in the environment.

VI. CONCLUSION

The designed project is used to detect and monitor the four parameters of the industries viz, the temperature, humidity, light intensity and smoke detection. The project is found to be very useful for many industrial parameters monitoring and have capability to be extended for many other parameters monitoring.

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