Industrial Parameters Monitoring Process through IoT

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Abstract— In recent times, the use of automation is being used widely in the wireless technologies. These improvements in the technology provides a wide variety opportunity in the field of communication. When the internet access is given to the embedded devices, the demand for it will increase due to the capability of accessing of the devices. These devices access the parameters like temperature, voltage, Light intensity and humidity. The data can be viewed on both mobile and personal computer and the values are stored in the cloud. If there is change in the values of the measured parameters, the values automatically get updated. The large amount of data with super-fast transmission can be achieved in very less time. This paper deals with the design and implementation of wireless communication system of IOT using Raspberry Pi.

Keywords: *Industrial, IOT, cloud, automation, access.*

I. INTRODUCTION

These days all the social activities are mostly dependent on the automation. In current situation life without automation engineering cannot be imagined. A wide range of areas can be covered in the system research. [1] Automation is playing an important key role in the research. Few applications are designed to collect and send the data using through wireless. It is sent to a raspberry pi for wireless industrial automation. [2] The process to the wireless network for industrial standardized applications has become easy due to the use of automation. It is cost effective and this process are important to improve the process efficiency and to deliver quality output. The timeliness and accuracy of the system is also measured. [3] Wireless is one of the fastest growing advancement techniques in the field of process automation. [4] Various devices are used in the working of synchronization which are responsible for function related to control of the instrumentation and the operational management system. Wireless is very important has there will be no damage of wires and system will not be complex.

II. MOTIVATION

Increase in the technology, the efforts of the labour work should decrease which might results in the better improvement of work. The reduce time and efforts, we are taking up the project of the "Industrial Parameters Monitoring Process Through IoT". The use of wireless communication makes it even easier for the measurement process. The changes in the data can be accessed from any location in the Industry by reducing the efforts of human labour.
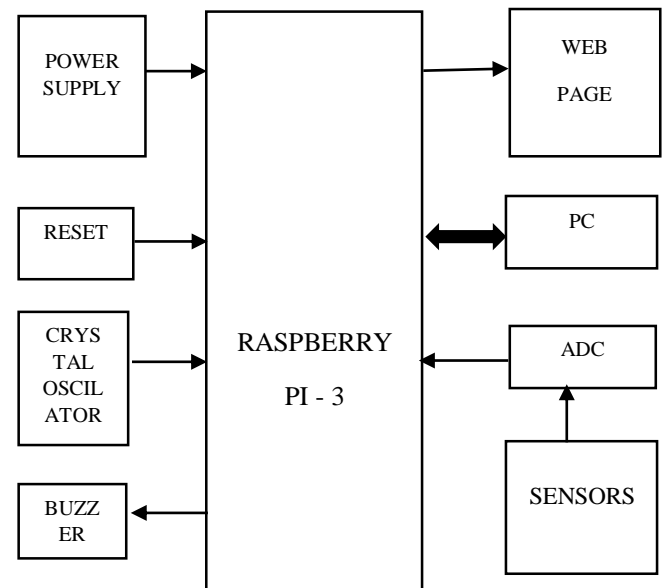
III. BLOCK DIAGRAM

Fig.I.Blockdiagram of the suggested approach.

All the four sensors i.e. temperature sensor, LDR sensor, A.C voltage sensor and humidity sensor are connected to Analog to Digital covertor(ADC) which inturn connected to Raspberry Pi which consists of an inbuilt Reset and Crystal Oscillator.
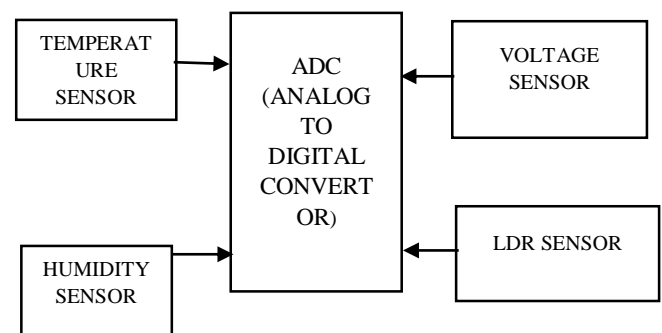

Fig.II.Block diagram of different sensors connected to ADC

IV. BRIEF INTRODUCTION TO HARDWARE COMPONENTS USED IN THE PROPOSED METHOD

A. Raspberry Pi

This set up consists of a micro controller called Raspberry pi which is a mini computer that was specifically created to make tech learning easier. It has lot of components for computer- based projects, like USB ports, an ethernet port, an SD card slot, WI-FI antenna ports, and more. It does not come with peripherals, like cables, a keyboard, a mouse, or a monitor. It is great for learning program languages, like Python, Scratch, and Wolfram.

B. Temperature Sensor

Temperature sensor used is LM35 which is series precision integrated- circuit with an output voltage linearly proportional to the centigrade temperature. The advantage of temperature sensor is measuring the temperature and checking the battery temperature.

C. Voltage Sensor

Voltage sensor i.e. DHT11 is primary function is to detect and measure AC and DC voltage levels. When the presence of voltage is detected, the sensors provide an output in the form of analogue voltage signal, current levels, frequency and modulated frequency outputs or audible sounds

D. Humidity sensor

Humidity sensor is one of the most important devices that has been widely in consumer, industrial, biomedical, and environmental etc. Humidity sensor used in the project is Rotary A.K.A Radio Pot. Humidity is also a major factor for operating sensitive equipment like electronics, industrial equipment, electrostatic sensitive devices and high voltage devices etc. In industries high humidity will reduce the amount of oxygen in the air and hence reduces the firing rate.

E. LDR sensor

LDR sensor is light dependent resistor. It works on the

principal of photo conductivity. The passive components are basically a resistor whose resistance value decreases when the intensity of light decreases. The main advantage of LDR is cheap and readily available in many sizes and shapes. They need small power and voltage for its operation

F. WI-FI Module

WI-FI module is in-built in raspberry pi. WI-FI used is ESP8266 is one of the most popular WI-FI modules available in the market, allowing makers to develop IOT products with ease. However, a lot of projects require hard coding the WI-FI credentials into the device module, which is fine for prototyping but if your devices are sent to remote locations then the Wi-Fi credentials will have to be changed resulting in reprogramming the device.

G. Buzzer

Buzzer gives a sound of beep when there is changes in the sensors occur. It gives beep when the values of sensors are less than or greater than the prescribed values or the given values. Buzzer is an electromechanical, mechanical or piezoelectric. These consists of alarms and timers.

H. ADC (Analog to Digital Convertor)

This device converts the analogue data into the digital data. The physical parameters such as temperature, voltage, humidity, Light intensity gives the analog data, the analog data cannot be given to the controller so the data is converted to digital using ADC.

V. SOFTWARE

Python is a easy programming language with which a raspberry pi 3B can interface.it runs on windows, Linux/Unix, Mac OS X and has ever been ported to Java and, NET virtual machines. It has some pre-defined libraries which or not available in any of the languages like C, C++, java etc. it works more quickly and integrates systems more effectively. The web page is used to see the results of the sensors. The webpage used is "Think Speak. Com".

VI.WORKING OF THE SYSTEM

The power supply of 5V is given to the controller. HDMI connector is connected to the Raspberry pi. Raspberry pi is a micro controller [5]. All the sensors i.e. temperature, humidity, voltage, Light Intensity sensors parameters are given to ADC and the digital data is taken by controller from ADC. If we want the direct range of sensors, the minute changes of sensors cannot be detected by microcontroller so ADC gives the digital data to controller. All the sensors have same power supply of 5V, ground and which are connected to ADC channels ranging from 0 to 3. All the output of sensors is given as input of the ADC and the output of ADC is given as input to the controller. Buzzer has two terminals positive and negative. Buzzer gets ON and OFF when VCC and the ground gets the power supply and the ground pin is given to the controller GPIO pin. It has in-built WI-FI which uses to send the data into the cloud. If any parameter becomes abnormal the buzzer will be on. The results of the system can be seen in graphical form in the "Think Speak.com" web page.
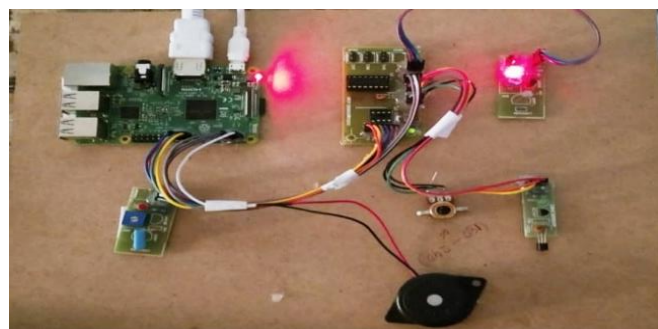

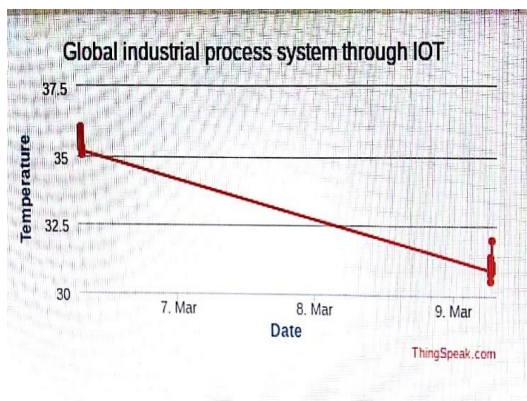Fig.III. Setup of the proposed System

VI. EXPERIMENTAL RESULTS
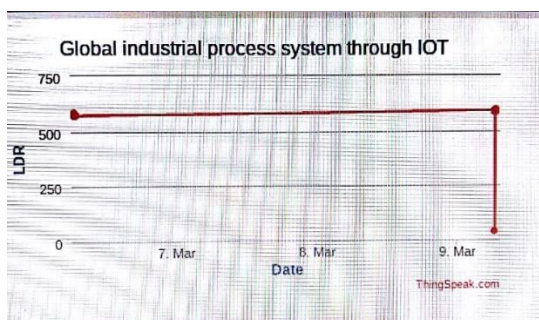

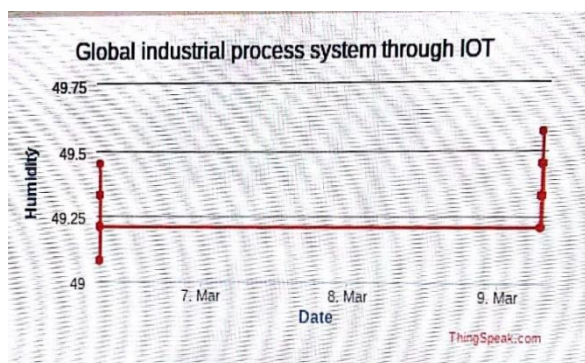Fig. IV. Temperature sensor output

Fig.V.LDR Sensor Output
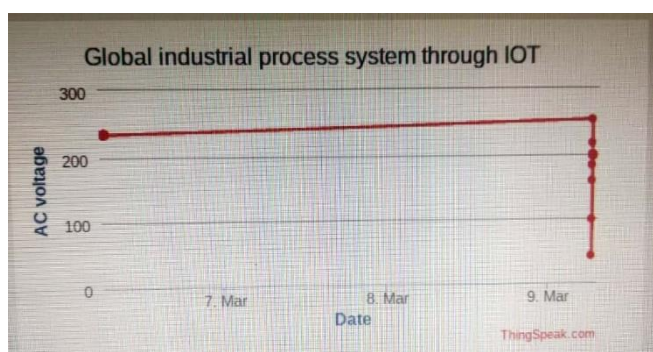

Fig.VI.Humidity Sensor Output

Fig.VII.AC Voltage sensor output

VII. CONCLUSION

"Industrial Parameters Monitoring Process Through IoT", the data obtained from different sensors are showed in the monitor. If there is change in the values, values get updated automatically. The changes in the data can be accessed from any location in the Industry by reducing the efforts of man power. The data obtained is shown in the graphical form and can be shown in numerical form also.

VIII. FUTURE SCOPE

The evolving technology is playing a crucial role in the improvement of automotive business. This will make a better use of IoT thus resulting in the gain of a competitive edge. In future we can attach a camera module to raspberry pi for the automation of security purposes and by connecting the headphones to the controller port we can listen the changes of the parameters in the industries.

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