

# IoT Industrial Based Monitoring System Using Raspberry Pi

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**Abstract-** The Internet of Things sits on the intersection of sensors, networks, layout, commercial enterprise fashions, and a massive type of industries. At its excellent, the IoT is the idea that wireless verbal exchange and digital intelligence can be embedded into the whole thing round us clothing, motors, houses, flowerbeds, even the ground beneath our feet. Underlying this transformative idea are complicated and interwoven layers of physical, virtual and human infrastructure so as to allow billions of gadgets to accumulate, transmit and collect statistics via the Internet.

Coal mining is usually a hard and perilous challenge, with hundreds of twist of fate and much less safety. In this assignment a unmarried board pc i.e. Raspberry Pi is used which acts as a CPU with ARMv8 (BCM2837) microprocessor, 1.2 GHz velocity and 1GB of RAM is used this is programmed in python programming language. A Wireless Sensor network (WSN) is created the use of the sensors like Temperature sensor, Humidity sensor, Gas sensor and LDR, whose values can be up to date every 2nd and deliver to the Raspberry pi so as to automate the technique like if Temperature is immoderate it'll ON the cooling FAN and deliver SMS, Humidity High Buzzer will prompt and SMS is probably sent mechanically. Any abnormality in sensor automation can be applied. At the identical time all of the WSN values may be accrued and deliver to the raspberry pi server on the way to be updated within the internet page with picture of any abnormality. Web page could have 3 fundamental element i.e. Tracking phase, photo updating and controlling section. This project is built which will make the subjects automatic with greater protection factors.

**Keywords-** ARM, CPU, GHZ, IOT

## I. INTRODUCTION

In the above block diagram Wireless Network Sensor (WSN) i.e. Temperature sensor for monitoring the atmospheric Temperature of the environment, Humidity to apprehend if any rainfall or monitoring the atmospheric humidity content cloth. LDR to come across the moderate intensity in that region if the slight is low the Led will glow routinely, the dependency of the LED depends on the LDR. Gas sensor discover polluted air if any toxic gas is detected it will offer the alert. This all sensors are analog sensors and as our Raspberry Pi3 a single board computer that's programmed in python programming language doesn't have the constructed in ADC so an outside known as MCP30008 is used to convert analog values to virtual values. Now our Raspberry Pi3 will

update all the sensor values within the server as a result and robotically on/off the buzzer, motor and cooling FAN constant with the alternate inside the WSN. And an internet website is programmed the use of HTML and PHP this is stored within the server i.e. Apache server and moreover SMS API is constructed to ship SMS. Also a virtual camera is used to seize the photograph while there is any abnormality in sensor values.

## II. LITERATURE SURVEY

In industrial automation, there are different manufactures producing their own PLCs [3]. The PLCs in an industry is connected with distributed control system (DCS) by protocols such as RS232/485, USB and Ethernet [1] [5]. The DCS has multi-level hierarchical network structure for communication. Due to the hierarchical network structure, the communication becomes complex and high in cost. Complete network from field level to control level is not formed [8]. The java simulators can be used as front end panel for monitoring and control. The java servers used to control the process in a field [5]. Internet of Things (IoT) is a fast developing technology that connects all devices with internet [6]. For soft real time systems TCP, UDP and IP protocols are efficient [3]. Embedded web server and Linux based system is cost effective with high performance [3]. The RS232 protocol is sufficient for parameter monitoring and control [2]. The master slave architecture gives good performance in real time control applications [7]. The graphical language is efficient for development of front end and back end panels for process monitoring and control [4]

## BLOCK DIAGRAM

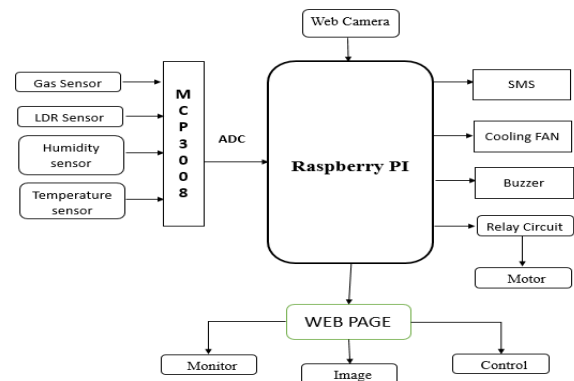


Fig.1: Block Diagram



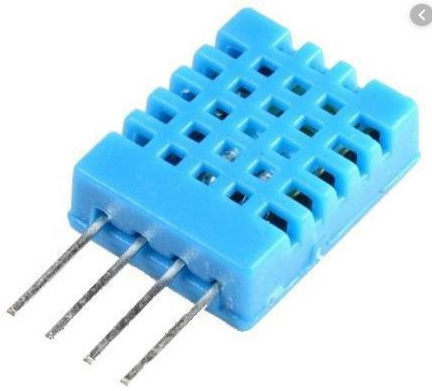


Fig.6: Humidity sensor

The DHT11 is a basic, ultra low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). Its fairly simple to use, but requires careful timing to grab data.

#### LDR SENSOR

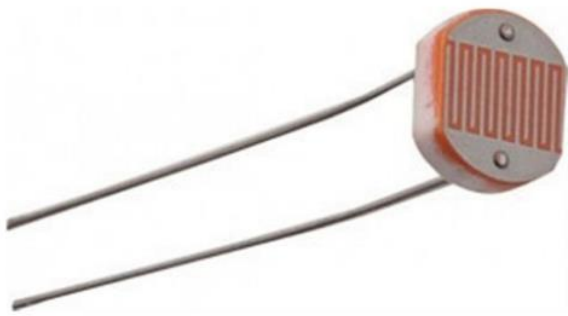


Fig.7: LDR sensor

An LDR is a component that has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used in light sensing circuits.

#### IV. SOFTWARE TOOLS

##### Linux

Linux is a free open source working framework and it has a place with the Unix working frameworks. In reality Linux implies the piece itself which is the core of the working framework and handles the correspondence between the client and equipment. Regularly Linux is utilized to allude to the entire Linux dispersion.

Linux appropriation is a gathering of programming in view of the Linux Kernel. It comprises of the GNU-task's parts and applications. Since Linux is an open source venture, anybody can alter and circulate it.

##### Raspbian Wheezy

Raspbian Wheezy is a free working framework in view of Debian appropriation. It is made by a little group of designers who are enthusiasts of Raspberry Pi. Raspbian is improved for the Raspberry Pi's equipment and it accompanies more than 35 000 packag-es and pre-incorporated programming. Raspbian is still under dynamic advancement and it intends to enhance the solidness and execution of the Debian bundles

##### Python

Python is a multi-worldview programming dialect: protest arranged programming and organized writing computer programs are completely upheld, and there are various dialect highlights which bolster practical programming and viewpoint situated programming (counting by meta programming and by enchantment strategies). Numerous different standards are bolstered utilizing expansions, including configuration by contract and rationale programming.

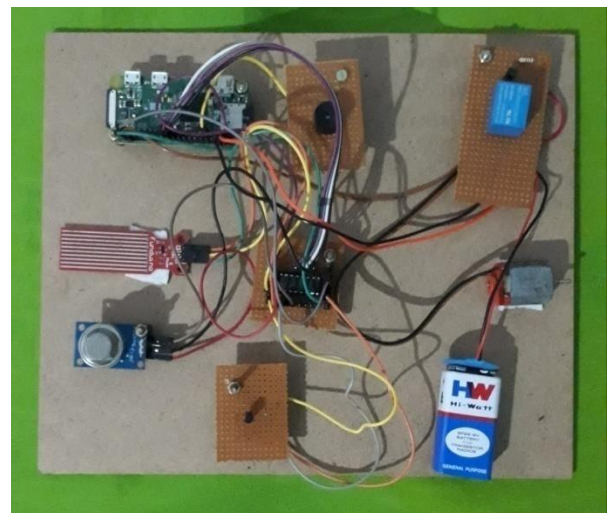
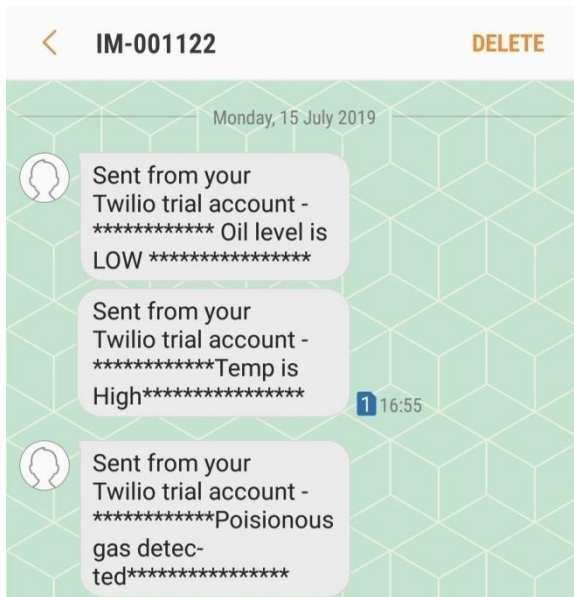


Fig.8:

##### RESULT:

```
Python 2.7.9 Shell
File Edit Shell Debug Options Windows Help
Python 2.7.9 (default, Sep 17 2016, 20:26:04)
[GCC 4.9.2] on linux2
Type "copyright", "credits" or "license()" for more information.
>>> ----- RESTART -----
>>>
Oil level: 6 Temperature: 35.87 GAS: 758
Oil level is LOW
Poisonous gas detected
Oil level: 6 Temperature: 34.415 GAS: 764
Oil level is LOW
Poisonous gas detected
Oil level: 5 Temperature: 34.415 GAS: 760
Oil level is LOW
Poisonous gas detected
Oil level: 5 Temperature: 34.415 GAS: 755
Oil level is LOW
Poisonous gas detected
Oil level: 5 Temperature: 34.415 GAS: 764
Oil level is LOW
Poisonous gas detected
```



### V. CONCLUSION

The have a look at on actual time tracking of toxic gases and precise parameters determined in underground mine has analyzed the usage of wi-fi sensor network. A real time tracking device is advanced to offer clearer and further problem to issue perspective of the underground mine. This system is displaying the parameters at the LCD at the underground segment wherein sensor unit is installation in addition to at the tracking unit; it'll possibly be beneficial to all miners gift within the mine to keep their existence in advance than any casualty takes area. Alarm triggers even as sensor values crosses the brink level. This device furthermore shops all the records within the laptop for destiny inspection.

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