

OIL FIELD MONITORING SYSTEM USING CLOUD

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Abstract:

The cloud based networks allow monitoring the data through the internet. The condition of the oil storage tanks can be monitored using level sensor, temperature sensor and pressure sensor. The sensor output is given to a microcontroller located in oil well. The data's are sent to the cloud via ESP8266 (Wi-Fi).oil well can be monitored and controlled from any place. In the existing model of oil well monitoring system, manual analysis is used. But this is a drawback because of the harsh conditions in the oil rug. This could be overcome by using remote monitoring. For this purpose, artificial intelligence in the workplace leads to cyber security problems. So, we go for remote monitoring system. In this method of analysis, temperature sensor, ultrasonic sensor and pressure sensors are used. The ultrasonic sensor is used to measured the tank level. The pressure sensor is used to measure the pressure of oil in the tank and the temperature sensor is used to measure the temperature of the surroundings. All these details are collected and is stored in the cloud. For this purpose here use Wi-Fi. All these data's cloud be retrieved from the cloud from any place. Thus, this method has proved to be an efficient method of monitoring oil rugs.

Key words: **level sensor, temperature sensor, pressure sensor, oil rugs.**

I. INTRODUCTION

An oil field is a region with an abundance of oil wells extracting petroleum (crude oil) from below ground. Because the oil reservoirs typically extend over a large area, possibly several hundred kilometers across, full exploitation entails multiple wells scattered across the area. In addition, there may be exploratory wells probing the edges, pipelines to transport the oil elsewhere, and support facilities. One of the major advancement in the field of wireless communication is the possibilities of remote monitoring and management. Earlier, commercial grade DVR and

NVR systems were deployed for monitoring. But they have the possibilities of being affected by harsh weather conditions and vandalism. Also, we have to deal with the damage, loss of equipment, leakage of hazardous chemicals etc. This condition was improved by rugged remote surveillance NVR. Then have on board cellular surveillance solutions which could be accessed from remote areas.

Cloud based monitoring is not only used for the purpose of cost efficiency, but to avoid compliance and insurance related costs. Existing systems include SCADA system that uses video monitoring

and additional sensors to collect data from every part of the operation. Advanced video monitoring process includes the use of artificial intelligence. But the use of lots of smart devices accessible through internet increases the cyber threat attack.

II. RELATED WORK

A. TRANSMITTER SECTION

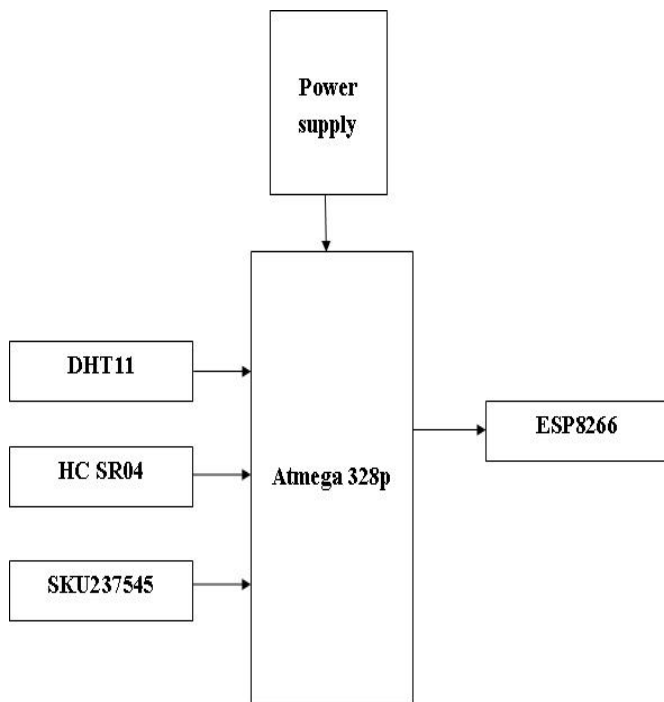


Fig1 Block Diagram of Transmitter

DHT11 is the temperature sensor is used to measure the Surrounding temperature of the oil well. HC SR04 is the ultrasonic sensor that is used to measure the distance of the oil from the top of the tank. Which means that it can be used to measure the height of the tank. SKU237545 is the pressure sensor that is used to measure the pressure of the oil flowing in the tank. The micro controller used is Atmega 328p. The microcontroller is supplied with a power supply of +5V. DHT11, HC SR04 and SKU 237545 are interfaced with Atmega 328p and act as the input for the same. The output from this arrangement is given as input to the Wi-Fi ESP8266 module.

RECEIVER SECTION

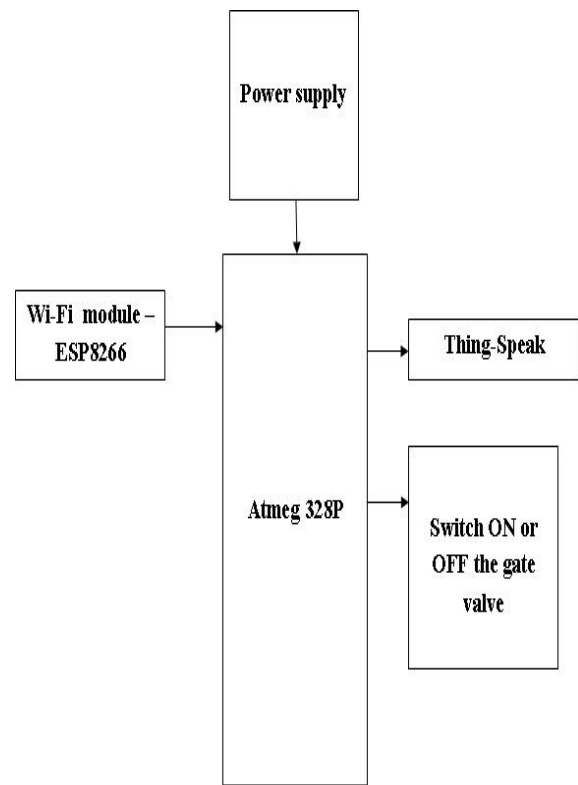


Fig 2 Block Diagram of receiver

Atmega 328p reads the value from ESP 8266 module. The microcontroller is connected to ESP 8266 module from which the messages are sent to user. We have created a login ID in Think Speak website where all the data's are stored. If the value The pressure is continuously monitored. The values are updated via ESP 8266. The values are monitored such that when the value stays within the threshold value, the valve remains closed and when the value exceeds the threshold value, the valve opens. This application is held by authorized persons.

III.RESULTS

The oil field is monitored using cloud. The temperature, tank level and the pressure of oil flow are monitored continuously and uploaded in the Thing Speak via ESP 8266. The corresponding output can be viewed in Thing View App.

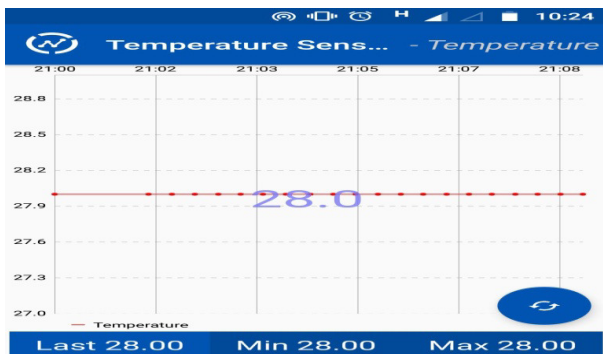


Fig 3 DHT11 Temperature Sensor Output in Thing Speak web page

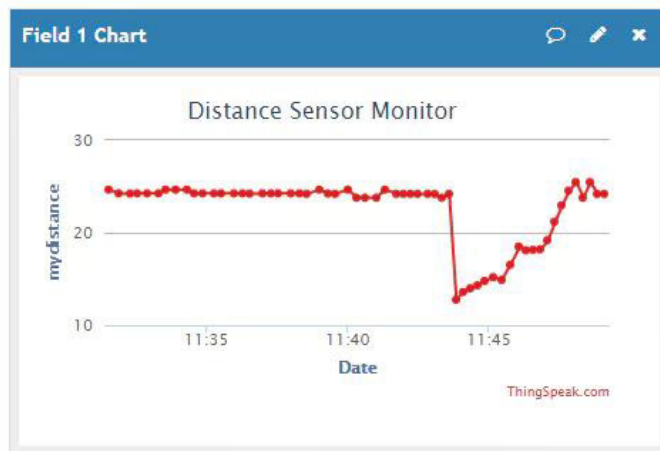
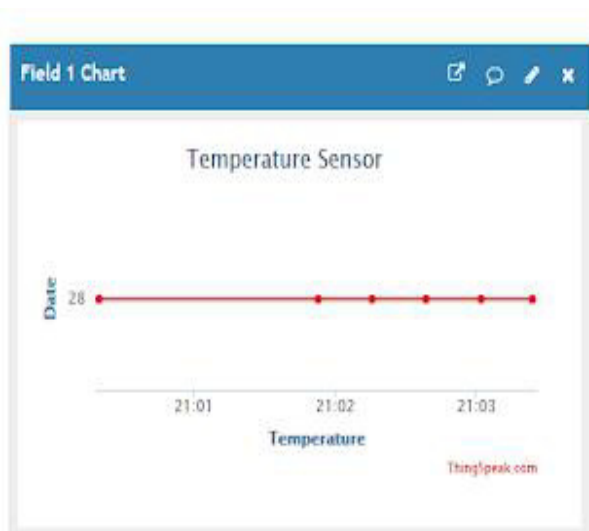


Fig 5 Thing View Output of DHT11 Temperature Sensor

Conclusion:

The monitoring of oil field is implemented by a smart way of transferring the field parameters to smart phone apps. The hardware portion plays a major role of detecting and reading the field parameters successfully. Thereby, the software portion is to deliver the field parameters to the human which is done by the trending and the most reliable term IoT. The Arduino IDE software helps greatly to interface the hardware kit and to monitor and control. The system helps to send the critical field parameters to the authorized person in the industry. GSM can be used for transferring the information. But here, instead of using GSM, we have used ESP 8266 for updating and this can be viewed in Smart phones.

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