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Smart Industry Security System Using IOT

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ABSTRACT

Present work explains various security issues in the existing industry automation systems and proposes the use of logic based security algorithms to improve industry security. In the work done so far, communications were accessed through Bluetooth or Zigbee which are limited in range and not secure.These days IOT (Internet of Things) plays a important role in industry and it will reach the smart phone. The environmental factors such as temperature, humidity, moisture is necessary to monitor continuously for preventing our earth (environment) from green house effect. In this project, Arduino microcontroller and GPRS are used for communication. Temperature sensors and gas sensors are used for fire detection or any gas leakages, IR sensor is used verify the motion of the users. These sensors are placed in the primary areas of the industry such as cylinder manifold, control room, backup room and in unauthorized access rooms to detect any unusual activity. If any variations detected by sensors, it will sends a message to Arduino microcontroller to alert the GPRS and send a message to the mobile, so that the User can verify the alerts in his mobile or pc from any part of the world.

Keywords: GPRS, IR Sensor, Temperature Sensor, Arduino Microcontroller

I. INTRODUCTION

Wireless technology is the most trending technology widely used in every human's life. In the existing systems we are using many wireless technologies like ZigBee, Bluetooth etc..,

BLUETOOTH:

Bluetooth is most widely used wireless communication protocol in portable devices. It has operating frequency of 2.4 GHZ.

ZIGBEE MODULE:

Zigbee Module is used in wireless communication for short distance communication like in the order of 100 meters.

DISADVANTAGES:

- Limited area
- Less data usage
- Less data rate.

Proposed system:

In recent days, security to home is becoming most common need for every person in cities. To achieve this we have implemented one system to observe temperature, gas and identification of human. We are using latest technology i.e., GPRS with Arduino to update parameters to the cloud.

ADVANTAGES:

- To know the status of the parameters like temperature, gas and person identification in your home from anywhere in the world.
- High accurate response from the system.

Block diagram:

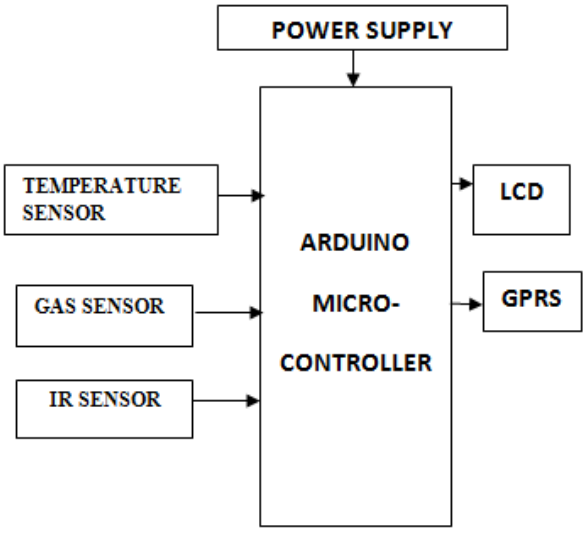

Figure 1. Block Diagram

Hardware description:

Arduino (Atmel328p):

The Arduino Micro Controller is a open source platform which has 6 analog pins, 14 digital pins, one serial port, one power jack and one usb jack for code dumping.

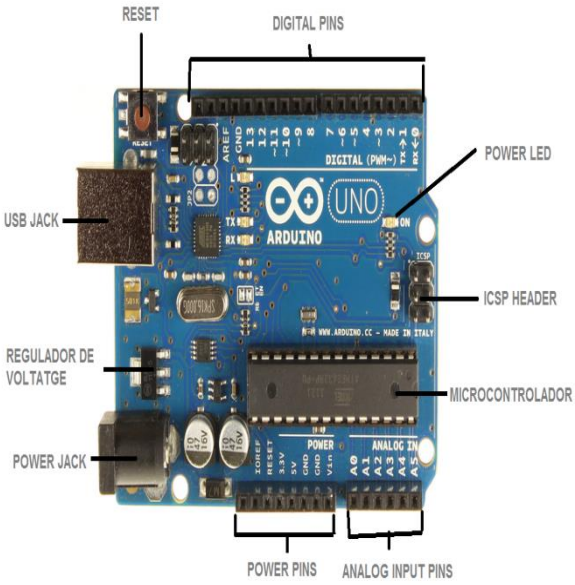

Figure 2. Arduino Microcontroller

TEMPERATURE SENSORS (DHT11):

DHT 11 sensor is used to measure temperature as well as humidity. It is resistive to wet components and includes NTC temperature measurement devices. It is much useful in industrial and medical sector.

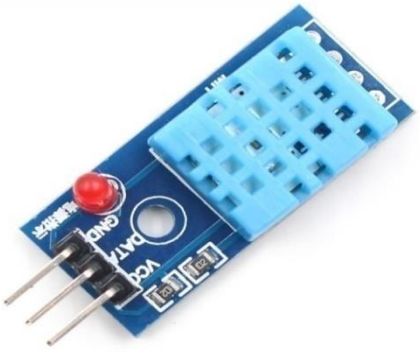

Figure 3. Temperature Sensor

GAS SENSORS (MQ2):

The gas detector is a device used to detect the poisonous gas in particular area.

Different types of gas sensor available in market today

- MQ2
- MQ3
- MQ4
- MQ5
- MQ6
- MQ7
- MQ8
- MQ9

Each type has unique characteristics to detect the gas. Sensible material of the gas sensor is Sno2.

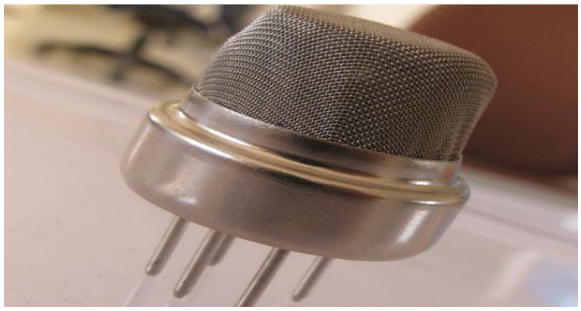

Figure 4. Gas Sensor

The gas sensor module includes a steel cover beneath which a recognizing portion is housed. This recognizing portion is subjected to current through accomplice leads. This current is called as warming current through it, the gases moving towards the recognizing portion get ionized and are eaten up by

the recognizing portion. This developments the resistance of the recognizing section which changes the estimation of the display abandoning it. When any gas is detected the output comes fro the sensor module to the controller or relay.

Figure 5. Steel cover of the gas sensor

Gas sensor uses are widely useful in our daily life for more security in our homes.

IR SENSORS:

IR (infrared sensor) is like a proximity sensor which has two LEDS (i.e., one black led and one white led), one comparator (LM325), and potentiometer. Here white led transmits IR rays forward direction Upto some extent if there is any obstacle in between some part rays will be reflected back. The black led observes reflected part. The comparator observes frequency variation between incident and reflected waves. By this it will generate digital output.

Block diagram and Functioning of IR Sensor:

The affectability of the IR Sensor is tuned utilizing the potentiometer. The potentiometer is tunable in both the headings. At first tune the potentiometer clockwise way with the end goal that the Indicator LED begins shining. Once that is accomplished, turn the potentiometer sufficiently only in hostile to clockwise heading to kill the Indicator LED. Now the affectability of the beneficiary is greatest. Along these lines, its detecting separation is greatest now. In the event that the detecting separation (i.e., Sensitivity) of the recipient is should have been diminished, at that point one can tune the potentiometer the counter clockwise way starting here.

Further, if the introduction of both Tx and Rx LED's is parallel to each other, with the end goal that both are confronting outwards, at that point their affectability is greatest. In the event that they are moved far from each other, with the end goal that they are slanted to each other at their bound end, at that point their affectability decreases.

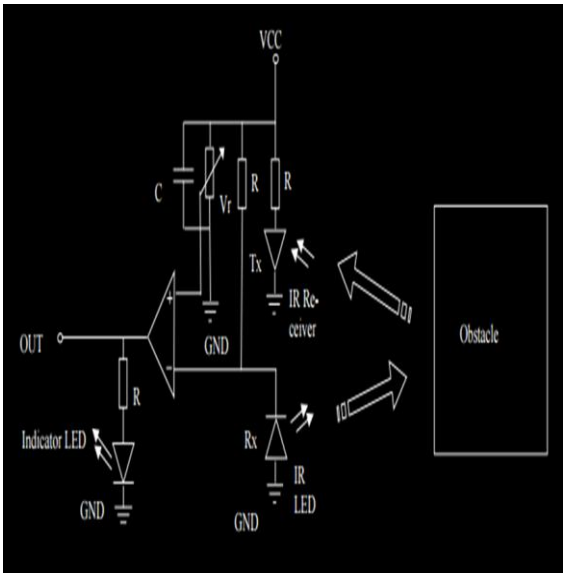

Figure 6. Block diagram of IR sensor

Tuned affectability of the sensors is restricted to the environment. Once tuned for a specific encompassing, they will work splendidly until the point that the IR enlightenment states of that locale almost consistent. For instance, if the potentiometer is tuned inside room/working for most extreme affectability and afterward taken out in open daylight, its will require retuning, since sun's beams additionally contain Infrared (IR) frequencies, therefore going about as an IR source (transmitter). This will aggravate the recipient's detecting limit. Thus it should be come back to work superbly in the new environment.

The yield of IR beneficiary goes low when it gets IR flag. Henceforth the yield stick is regularly low on the grounds that, however the IR LED is constantly transmitting, because of no impediment, nothing is reflected back to the IR recipient. The sign LED is off. At the point when an obstruction is experienced, the yield of IR recipient goes low; IR flag is reflected from

the hindrance surface. This drives the yield of the comparator low. This yield is associated with the cathode of the LED, which at that point turns ON.

Software description:

Arduino IDE:

The Arduino IDE (integrated development environment) is a software which is user friendly since it has inbuilt libraries to access any module.

The code to the controller is send through USB cable by just clicking "upload". We check errors by just clicking "compile".

Results:

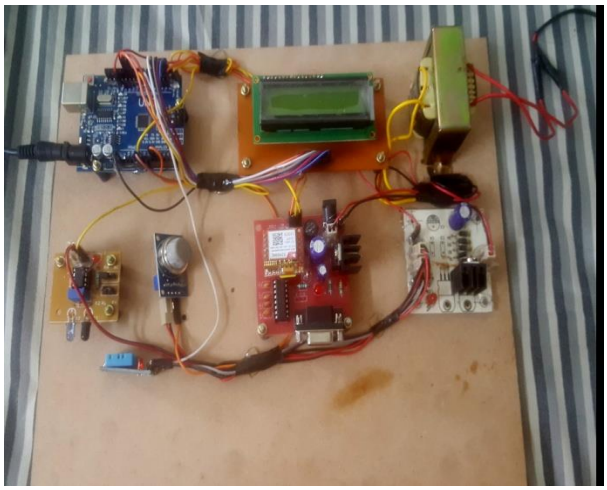

Figure 7. Project Kit

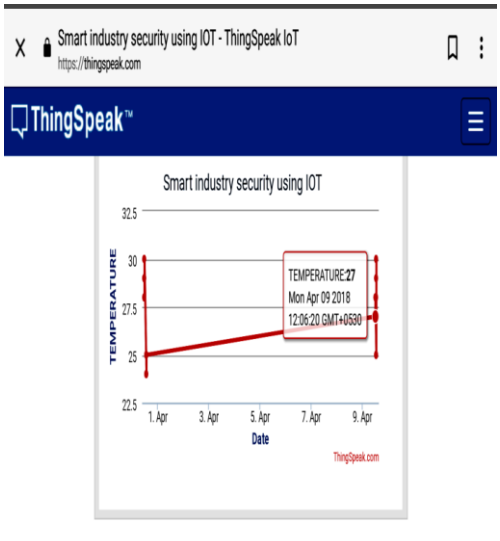

Figure 8. Temperature graph

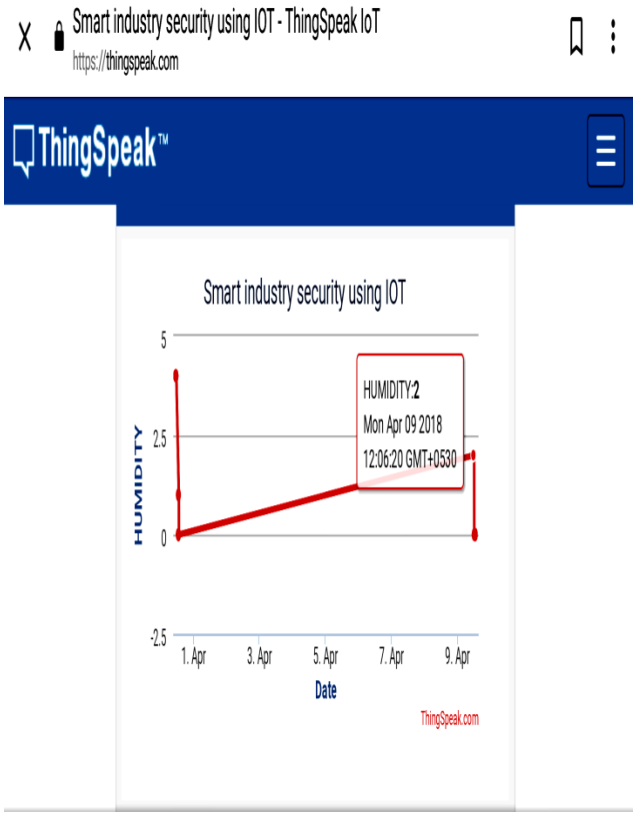

Figure 9. Humidity graph

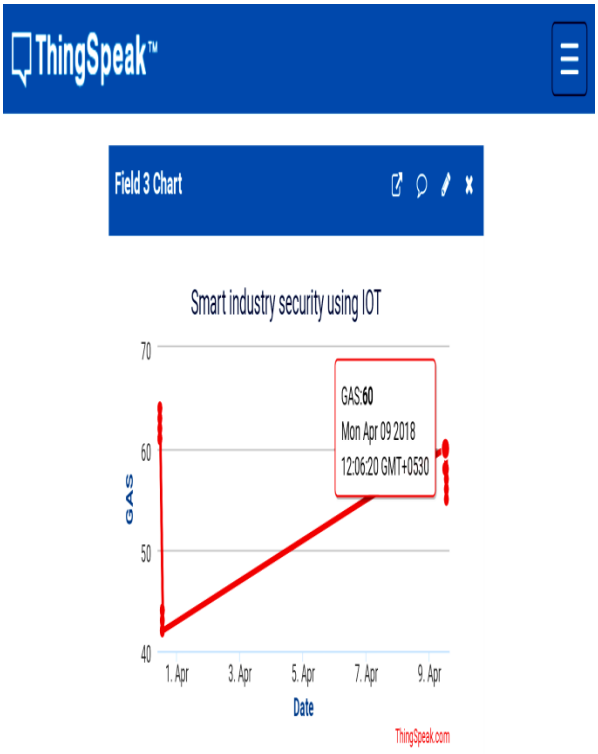

Figure 10. Gas graph

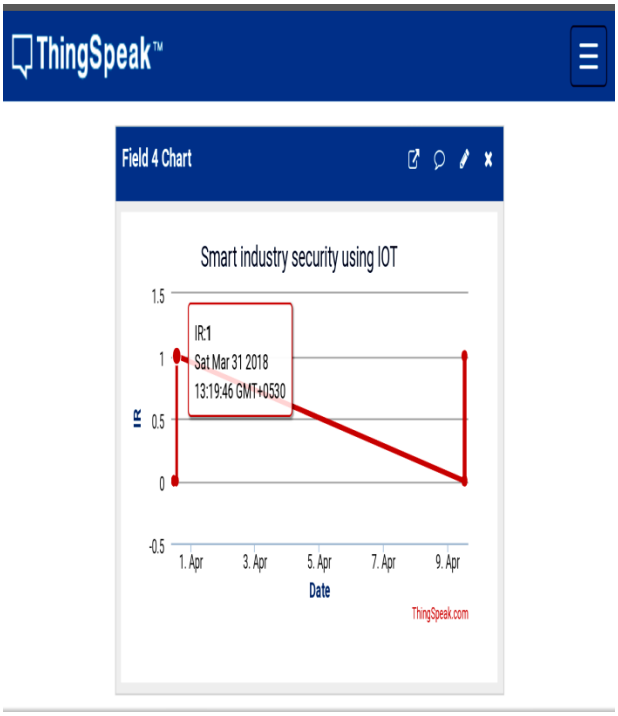

Figure 11. IR graph

Advantages:

It will secure our industry by detecting harmful gases and sending alerts to the registered user. The main advantage of this project is, it has very secured and accurate working of the sensors which sends the data to microcontroller. It can be used in home and offices as well.

Applications

1. In home security system
2. In industries.
3. To detect and secured from harmful gases at any place

II. CONCLUSION

By utilizing this venture we secure our industry from a few sorts of mischances even we are not in industry. In this project we use temperature sensor, humidity sensor, IR sensor and gas sensor. If any accident happens in our industry, temperature sensor will send the data to the system by using GPRS. Similarly, gas sensor will send data to system when gas sensor is activated.

In future, if there is any gas leakage detected by sensors we can place exhaust fans in order to let the gas out of the room. If temperature detectors detect any fire accident, we can use sprinklers to let the heat down. Not only the registered user can receive alerts, alerts can be sent to the nearest fire station as well.

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