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PROTECTING THE IOT BUSINESS WITH ARDUINO

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ABSTRACT: We may now have infrastructure systems that connect our surroundings in more ways than we ever believed possible thanks to the smart grid, smart housing, smart water networks, and smart transportation. These innovations were made possible by the Internet of Things (IoT).Embedded devices that are networked open the door to possibilities for intelligent handling and monitoring. These gadgets will have the capability to connect to the internet and communicate a wide variety of information to one another. A WIFI module and internet of things applications that make use of sensors are included in our plan to construct a tracking system for industrial use. It is able to rapidly determine the temperature, humidity, and gas concentration in a commercial or manufacturing setting by using data from sensor devices.

***Key Words*:** IoT, Message Alert system, WIFI- Module, ETC...

1. INTRODUCTION

At the present time, the industrial monitoring industry requires a greater amount of manual labor to be conducted in order to monitor and manage factors in plants such as temperature, humidity, gas, and so on. This is due to the fact that there are less automated methods available for performing these tasks. The people who live in more industrialized areas are the ones who are most concerned about this particular issue. When monitoring and managing the parameters are not carried out in the suitable manner, a risky condition can develop.

The vast majority of companies are forced to deal with issues of this sort as a direct result of the errors of their employees. We are eliminating errors that were previously caused by people by implementing industrial robotics and the internet of things into our production processes. Wireless Sensor Networks, often known as WSN for its abbreviation, have been put to use to collect data about various physical occurrences for a range of uses, including monitoring of oceans and habitats, as well as for surveillance.

2. EXISTINGSYSTEM

Putting in place a tracking and remote control system for a home security system that is powered by ZigBee and GSM technology Arbab Waheed Ahmad, Naeem Jan, Saeed Iqbal, and Chankil Lee came up with the idea of utilizing a ZigBee and GSM-based home security monitoring and remote control system. People have always had a long-standing need to carry out activities in their homes that provide them with a sense of being safe and in control of the situation.

The currently available technology needs to be upgraded so that it can provide global coverage, is dependable, can be used at a distance, and can operate in real time.

INDUSTRY-BASED SECURITY SYSTEM USING GSM AND ARDUINO

In addition to Pratiksha Patil, other people who contributed to the writing of this work include Shubenham Raut, Avinash Gaikwad, and Mudaliyar Raghurajan. This article provides detailed instructions on how to put together a GSM-based tracking and surveillance system that is both simple and affordable.

3. PROPOSED SYSTEM

The Internet of Things (IoT) industrial security

system that is connected with Arduino is designed to assist companies in reducing the likelihood that they will incur monetary losses as a result of accidents. Explosions and other forms of property damage may be caused by gas leaks that occur in furnaces and other locations where rapid fire detection is essential. There is a possibility that flames will result in catastrophic losses for businesses. Reduced visibility in the workplace not only makes working conditions less safe but also raises the risk of accidents occurring.

When working with Arduino, this feature is built right into the system itself. By keeping an eye out for fires, gas leaks, temperature changes, and inadequate illumination, the system is intended to keep factories safe and reduce the amount of accidents and losses that occur. This is accomplished through the system's architecture. LCD stands for liquid crystal display, and the component set features sensors for light, gas, and temperature, in that order. Also included is an Arduino board.

HARDWARE REQUIREMENTS

- ARDUINOUNO
- LCDDISPLAY
- WIFIMODULE
- LDRSENSOR
- GASSENSOR
- TEMPERATURESENSOR
- RELAY
- POWERSUPPLY

SOFTWARE REQUIREMENTS

- ARDUINOIDE
- EMBEDDEDC

MODULE DESCRIPTION

- The module is divided into three parts
- Power supply
- Hardware connections
- Software interfacing

POWER SUPPLY

The power supply mainly consists off our parts

- Electrical Transformer
- Rectifier Diode
- Electrolytic Capacitor
- LM8705VoltageRegulator

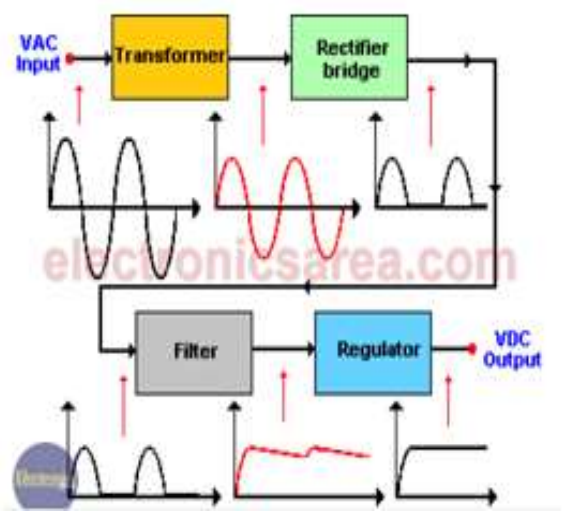


Fig-1: Obtaining a source of energy

ELECRTRICAL TRANSFORMER

The main winding of a transformer is subjected to a voltage of alternating current while the secondary winding is subjected to a different and lower value of alternating current when electricity is transmitted through the transformer.

It is imperative that the voltage at the AC output coincide exactly with the voltage that is wanted at the DC output.

RECTIFIER DIODE

The voltage of the secondary winding, which was an alternating current, is changed to a voltage of pulsing direct current by the rectifier bridge.(Take a look at the picture). In this particular scenario, we make use of a 12 wave converter in order to get rid of the wave's negative half.

ELECTROLYTIC CAPACITOR

The alternating current (AC) component of the rectifier is removed from the signal by a filter, which is comprised of one or more parallel electrolytic capacitors that either smooth out or squeeze the previous wave. After being charged to the highest possible voltage that the rectifier is capable of producing, these capacitors are then discharged when the pulsing signal finally stops.

LM8705VOLTAGE REGULATOR

After the signal has been received from the filter, the voltage regulator will give a constant voltage; in this case, it will be 12 volts DC. This voltage will not change regardless of whether the voltage supply or demand is changing. There are several applications for which a voltage regulator can be employed. There are two primary ways to design a voltage controller: using a single transistor or using

several transistors. The image that may be found below depicts the voltage regulator LM7805, which has an output of 5VDC.Another option is the LM7812 voltage regulator, which has an output of 12VDC.

HARDWARE CONNECTONS

This component of the machine houses a number of sensors, each of which is able to measure something different. For the purpose of analyzing market values, this project makes use of a fire, gas, and light-dependent resistor sensor.

THEMAJORHARDWARECOMPONENTSAR

- ARDUINO UNO
- LDRSENSOR
- GASSENSOR
- FIRESENSOR

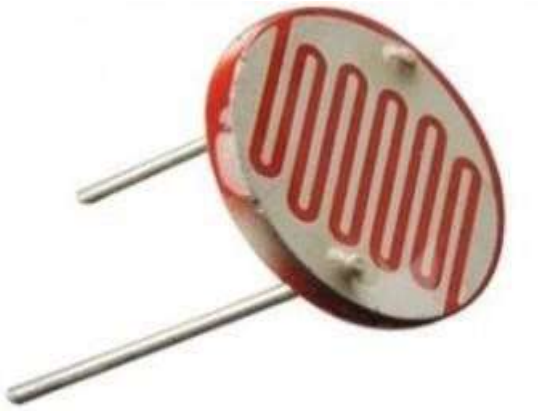
ARDUINOUNO

Arduino is a single-board microcontroller that was developed with the goal of making interactive programs and the environments in which they run available to a wider variety of users. The hardware consists of open-source components, one of which is either an Atmel ARM microprocessor with 32 bits or an Atmel AVR microcontroller with 8 bits of memory. Users are able to connect various extension boards thanks to the fact that the newest models come equipped with a USB port, six analog input ports, and fourteen digital I/O connectors.

Arduino Uno Board

LDR SENSOR

The majority of the time, lights and appliances in the home are operated manually, and they frequently require maintenance and repair. Despite this, it is still possible for energy to be wasted at any point during the process of controlling the device due to human error or unusual circumstances. We might be able to overcome this issue with the help of the light-dependent resistor circuit by modifying the loads in accordance with the intensity of the light.



Light Dependent Resistor

GASSENSOR

Because it contains more than 400 distinct types of sensory sensors, the average human nose is capable of detecting somewhere in the neighborhood of a trillion distinct odors. Despite this, a significant number of us do not know what gases are present in the air or how much of each one there is. This is the point at which the sensors come into play. A gas sensor is especially helpful when it is essential to monitor changes in the level of dangerous gases in order to keep the system safe and to alert people to any unanticipated hazards. This is because it is necessary to monitor changes in the level of hazardous gases in order to maintain the safety of the system.

FIRESENSOR

This tiny infrared detector module can detect light or fire sources with wavelengths ranging from 760 to 1100 nm. It is compatible with Arduino and operates with a range of nm. In addition to this, it has the ability to detect a lighter flame from a distance of 80 centimeters. The distance that needs to be measured climbs

as the intensity of the flame increases. It has a sensor angle of sixty degrees and is able to detect the flame spectrum with a high level of precision.

SOFTWAREREQUIREMENTS

- ARDUINOIDE
- EMBEDDEDC

ARDUINOIDE

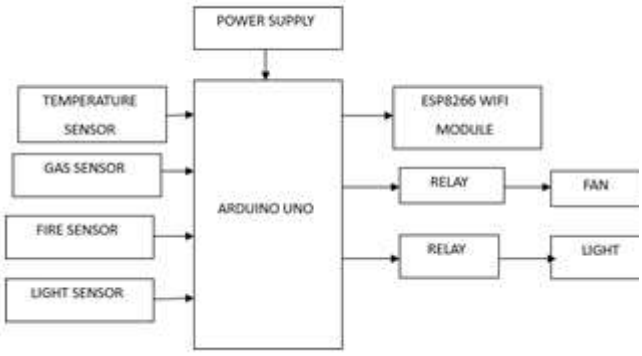
You are able to write code by using something called the Arduino Software (IDE), which is also referred to as the Arduino Integrated Development Environment. It has a message box, a text terminal, a tool bar with icons for common activities, as well as various menus to choose from.

Connecting the Arduino and the actual hardware makes it feasible to add applications and interact with those applications.

TOOLS

- ARCHIVESKETCH
- FIXENCODINGAUTOFORMAT&RELOA
- SERIALMONITOR
- BOARD
- PORT
- BURNBOOTLOADER

BLOCKDIAGRAM

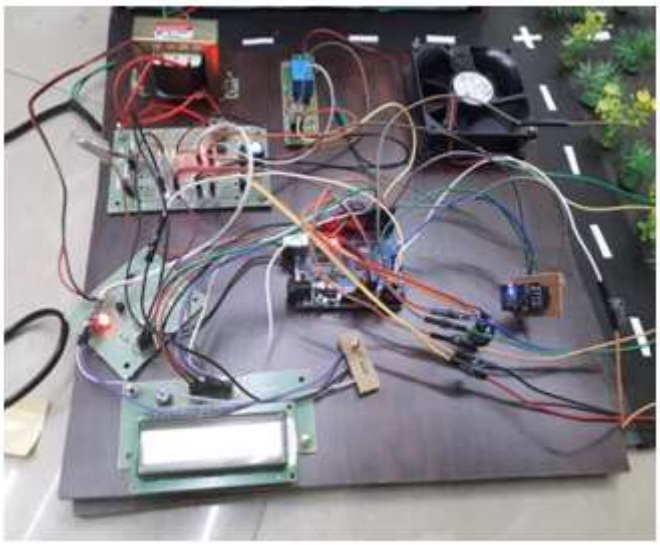


4. CONCLISION

The subject of discussion in this research is a reconfigurable smart WSN unit that is based on the Internet of Things and is used for monitoring various industrial safety parameters. The system is equipped with a level of intelligence that is sufficient to collect data from the sensors. The design was conceived with the intention of easing the process of wireless communication. It is suited for use in a data collection system for the Internet of Things that is meant to gather data at a high rate as it functions swiftly and in real time. This is because the system is designed to collect data at a high rate. When designing secondary circuits, utilizing an Arduino Uno makes the process much simpler, and the improved versatility of the system makes it possible to expand the scope of the project.

You are free to use any sensor you choose as long as it can communicate with the device it is connected to. In this essay, we will investigate the fundamental plan for constructing the smart sensor interface device that can be reconfigured. We were able to demonstrate that the system functioned well in the real world by utilizing the example of monitoring workplace safety signals within the context of an Internet of Things scenario. This allowed us to demonstrate that the system was effective. When it comes to the Internet of Things, there is still a great deal of intriguing research that can be done via WSN.

5. RESULT



REFERENCES

1. S.Li,L.Xu, X.Wang, and J.Wang, "Integration of hybrid wireless networks in cloud services oriented enterprise information systems," Enterp. Inf. Syst., vol. 6, no. 2, pp. 165–187, 2012.

2. Q.Li,Z.Wang,W.Li,J.Li,C.Wang,and R.Du,"Applications integration in a hybrid cloud computing environment: Modelling and platform,"Enterp.Inf.Syst., vol. 7, no. 3, pp. 237–271, 2013.

3. L.Wang,L.D.Xu,Z.Bi,andY.Xu,"Datacleani ngforRFID and WSN integration," IEEE Trans. Ind. In format., vol. 10, no. 1, pp. 408–418, Feb. 2014.

4. Y.Fan,Y.Yin,L.Xu,Y.Zeng, and F.Wu,"IoT

based smart rehabilitation system, ”IEEE Trans. Ind. Informat.,vol.10, no. 2, pp. 1568–1577, 2014.

5. W. He, G. Yan, and L. Xu, “Developing vehicular data cloud services in the IoT environment,” IEEE Trans. Ind. Informat., vol. 10, no. 2, pp. 1587–1595, 2014.

6. Mihai T.Lazarescu, “Design of a WSN Platform for Long- Term Environmental Monitoring for IoT Applications” IEEE Journal on emerging and selected topics in circuits and systems, vol. 3, no. 1, March 2013

7. Ahmad El Kouche“Towardsa Wireless Sensor Network Platform for the Internet of Things”, IEEE ICC 2012 - Ad- hoc and Sensor Networking Symposium

8. E.J. Duarte-Melo and M. Liu, “Data-Gathering Wireless Sensor Networks: Organization and Capacity,” Computer Networks, vol. 43, pp. 519- 537, 2003

9. Siyuan Chen, Minsu Huang, Shaojie Tang, Yu Wang, “Capacity of Data Collection in Arbitrary Wireless Sensor Networks”, IEEE transactions on parallel and distributed systems, vol. 23, no. 1, January 2012.

10. Y. Li, M. Hou, H. Liu, and Y. Liu, “Towards a theoretical frame work of strategic decision, supporting capability and information sharing under the context of Internet of Things,” Inf. Technol. Manage., vol. 13, no. 4, pp. 205–216, 2012.