

1.FIRE ALARM SYSTEM USING NODE MCUESP8266

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Abstract—The aim of the project is to realize the upcoming concept of the IOT [internet of things] where every “Thing” will be connected over a network for data acquisition. The acquired data is then utilized for making better decision in a real time environment. Early detection of fire accident is very crucial in preventing heavy casualty and damage in any industry. Present fire detection systems employ the method of raising alarm at the site of detection. A smart system can detect fire accident and also take an action or control the output of the system in real-time based on data acquired from sensors. The role of IOT is not just controlling the output of a system in real -time but to do the same for multiple systems by connecting them all to a centralized server over a network . since all data is available in a centralized server, they can be monitored and controlled from remote locations.

Keywords—*Arduino Microcontroller ,Monitoring
System ,Fire Detection System ,IOT.*

I. INTRODUCTION (HEADING I)

The purpose of the fire service is to protect human life ,our property and earth natural resources from fire and other emergencies . with the best techniques , training regime equipment to meet public expectation .mitigation preparedness and risk management have taken on new benefit with challenges facing the fire service today . Fast response cannot be achieved without good planning and preparedness .wireless network can be the most useful way to collect various parameters and all the most useful way to collect various parameters and all the information needed by the environment such as industrial , shipboard , home , building , utilities and transportation system automation .But these sensor is resources constrained which include the battery life ,communication bandwidth ,CPU storage and capacity. Smart fire alarm system utilizes information on temperature and smoke detection at the site to initiate an action . This project aims to demonstrate a smart fire alarm system fire alarm system based on real-time temperature measurement .Two IOT end units connected to server over a wireless TCP/IP network for real -time monitoring & controlling realize the application IOT in the smart fire alarm system. It is proposed to utilize Arduino prototyping board which is an open source design and needs programming (based on C++)for fabricating IOT end units . with programming , temperature sensors (LM35) output is transferred through Wi-Fi module (ESP8266) to a server .ESP8226 is the wi-Fi module used to establish a wireless TCP/IP connection .A personal computer enabled with IIS service can be configured as a server with MYSQL for database certain and PHP for front end development, this server can be used to log temperature value and then the logged data is analyzed to take a decision and control multiple smart fire alarm systems on real time basis.

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II. EASE OF USE

USES OF FIRE ALARM SYSTEM

User understanding of detector signals: this research examines how well people comprehend the difference sounds and lights emitted by detectors, ensuring they can correctly identify the fire alarm.

False alarm detection: studies explore ways to minimize accidental triggers through design features or user education, preventing unnecessary panic and ensuring shift response to genuine alarms.

Accessibility consideration: research investigates how to make detectors accessible for individuals with disabilities , ensuring everyone can make benefit from their life saving function.

A. Maintaining the Integrity of the Specifications

Installation: fire alarm system must be installed by qualified professionals following the manufactures specifications and relevant building codes. This ensures proper placements, wiring, and functionality of all components.

Inspections and testing: regularly scheduled inspections and testing, conducted by qualified personnel, are essential. This inspection identifies potential issues, verify system operation, and ensure compliance with codes.

Literature review

A Zigbee technologies based wireless vehicle identification and driver authentication system consisting of a central data based of authorized vehicles , Zigbee RF, vehicles tags, RF tag reader and RF tag writer. Zigbee is based on IEEE 802.15.14 standard for wireless personal area networks that is being used in many ,commercial and research applications today were it as become an attractive solution for low power and low cost applications . the RF tag is placed in a vehicle that will be approaching the entrance of an establishment the RF tag reader is used to communicate with the RF tags and the RF tag writer is used to program or write to the RF tags. Vehicle identification is performed by reading the serial number in the RF tag and driver authentication is done by means of a password entered through the RF tag .

B. Abbreviations and Acronyms

Node MCU: A Programmable micro controller unit . The name “Node MCU” is a combination of “node” and “MCU”. The firmware and prototyping board design are open source.

ESP8266:A node MCU node MCU that can detected fire by monitoring the surrounding environment for carbon dioxide, methane ,flame ,smoke ,humidity ,and temperature .The ESP8266 has GPIO,SPI,I2C,ADC,PWM,and UART pins for communication and controlling other peripherals .

Fire alarm system :A fire alarm control panel ,fire alarm control unit ,fire indicator panel ,or simply fire alarm panel is the controlling component of a fire alarm system.

C. components

- Node MCU : Node MCU refers to both open source firmware and development kit that make it easier to build IOT projects. The firmware is based on the Lua scripting language , and the development kit is built around the ESP8266 Wi-Fi module . Node MCU simplifies the process of creating connected devices with embedded Wi-Fi capabilities , making it a popular choice for DIY and prototyping IOT applications .
- ESP8266:the ESP8266 is low cost , versatile ,and popular Wi-fi module that enables wireless communication for electronic devices . originally developed as a standalone microcontroller , it gained widespread popularity for its built-in Wi-Fi capabilities .it features a microcontroller unit with GPIO pins , allowing it to interface with sensors , actuators, and other components.
- Buzzer: a buzzer is a physical output component that can be integrated into a device or system to provide audible alerts or notifications. Buzzer can often controlled through microcontrollers or IOT platforms . They can be programmed to generate different tones or patterns based on the desired notification or alert.
- A jumper wire typically refers to a short wire used to create a temporary electrical connection between two points on a circuit board or electronic components . Its often employed for prototyping , testing , or debugging purposes in IOT devices to establish a link between different elements of the hardware .
- Breadboard: The breadboard is a device used for prototyping and testing electronic circuit . it allows developer to easily connect and disconnect components without soldering . A typical breadboard consists of a grid of holes into which electronic components and jumper wires can be inserted . This enables quick experimentation and iteration during the development of IOT devices , allowing for easy rearrangement of components to test various circuit configurations.

D. Software components

Blynk: Blynk is a platform designed for building internet of things (IOT) application without extensive programming knowledge . It provides a mobile app that allows users to control and monitor IOT devices using their smartphones . Blynk supports a variety of hardware platforms , including Arduino , Raspberry pi,ESP8266, and others . Users can create a graphical interface on the Blynk app to interact with their connected devices , such as controlling light , sensors, or other IOT components . Blynk also offers a cloud services that facilitates communication between the mobile app and the connected hardware .Its a user friendly solution for creating IOT projects with a focus on ease of use and quick development.

Arduino IDE(Integrated Development Environment):It is a software application used for programming Arduino microcontroller boards. It provides a user – friendly interface for writing , compiling , and uploading code to Arduino devices . The IDE supports the Arduino programming language , which is simplified version of C/C++ with specific libraries and function for interacting with Arduino hardware .

Developers use the Arduino IDE to create and upload firmware to Arduino boards ,enabling them to control various electronic components and create interactive project .the IDE simplifies the process of writing code for Arduino by providing features like syntax highlighting interface for managing libraries and uploading code to the microcontroller.

E. Common Some Mistakes

Most people now a days demand to have appropriate security system installed at houses , commercial establishment ,factories and industrial units, and offices . the security can be in terms of alarms and cameras or a smart system controlling various units from a centralized console . regardless of what it is , its imperative for every installation company to ensure their procedures and technologies used are of the top level. One mistake and the entire security and safety of the property and people inside that will be compromised .

A security or fire alarm installation company high Wycombe needs to adopt and implement fair and just practices for their services. And even then, there are certain mistakes persisting in the procedures and technologies that compromise the security and the safety net the systems are meant to provide. Keeping this in mind, we have shared certain details in this below article , discussing has to be avoided at all costs.

Improper location choices for alarm and other components:

One of the most common insulation mistake that fire and security companies make in choosing improper location for all the components . For Example, outdoor cameras must be installed at an angle that they provide wide views , instead of having a narrow field of vision. Similarly ,fire alarm being installed near the kitchen will always set the trigger without any reason.

As a result , people will always in a frenzy , expecting to hear the alarm blaring out every now and then with no proper threat . Besides , if the installation locations are not appropriate for both fire and security systems , you cannot expect them to work appropriately and maintain in the safety and protection nets .

III. SETTING TOO MANY FALSE ALARMS

There is no need to set multiple false alarms because that can hamper the daily working of people within a property and also give rise to chaos . For instance , a false smoke alarm in a professional kitchen is not at all recommended because the temperature and smoke will always remain high . Similarly , if we consider a theft alarm in a house , there is no set to different types of false alarms because that can disturb people living inside or the neighbours. Instead ,it's better to set a couple of false alarms only at proper conditions so that they can make people more aware and vigilant.

A. Authors and Affiliations

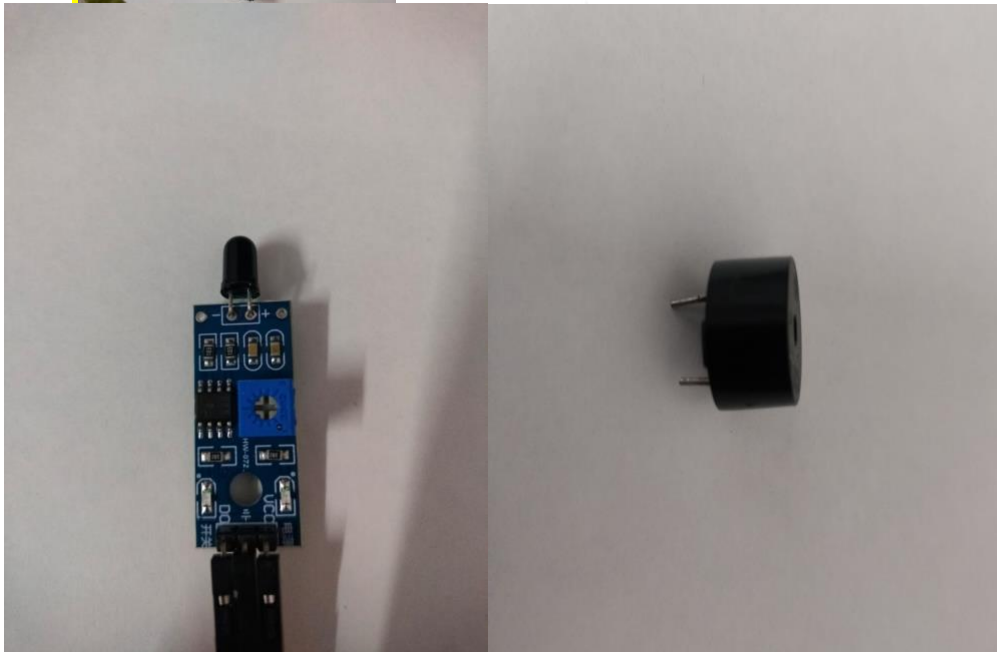
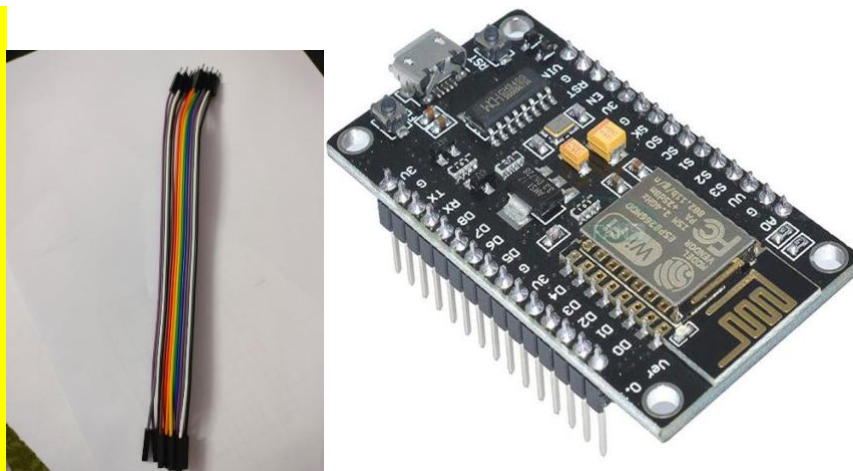
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a) Figures and Tables



REFERENCES

1. Cytron USB to UART Converter user manual, cytron technology inc., 2011, pp 1-23.
2. S.D. Dissanayake, P.P.C.R. Karunasekara, D.D. Lakmanarachchi, A.J.D. Rathnayaka, and A.T.L.K. Samarasinghe, (2008). "Zigbee wireless vehicular identification and authentication system". International conference on information and automation for sustainability, pp. 257-260.
3. F. He, Z. Du, and Y. Sun, (2009). "Indoor dangerous gas environment detected by mobile robot". In 2009 IEEE International Conference on Robotics and Biomimetic (ROBIO), pp. 396-401.
4. M.F. Jan, Q. Habib, M. Irfan, Jan, M.F., Habib, Q., Irfan, M., Murad, M., Yahya, K.M., and 171 G.M., (2010). "Carbon monoxide detection and autonomous countermeasure system for a steel mill using wireless sensor and actuator network". In 2010 6th International Conference on Emerging Technologies (ICET), pp. 405-409.
5. A. Somov, A. Baranov, A. Savkan, D. Spirjakin, A. Spirjakina, and R. Passerone, (2011). "Development of wireless sensor network for combustible gas monitoring". Sensors and Actuators A: Physical, vol. 171, No. 2, pp. 1-8.
6. V. Jelicic, M. Magno, G. Paci, D. Brunelli, and L. Benini, (2015). "Design, characterization and management of a wireless sensor network for smart gas monitoring". In 2015 4th IEEE International Workshop on Advanced Sensors and Interphase (IWASI), IEEE 11th International Colloquium on Signal Processing and its Application (CSPA2015), Kuala Lumpur, Malaysia, No. 6-8, pp. 115-120.
7. Development and implementation of wireless multigas concentration cloud system.
8. expressif.com
9. arduino.cc