ISSN: 2278-4632
Vol-13, Issue-06, No.02,June : 2023

HOME AUTOMATION WITH ARDUINO IOT CLOUD

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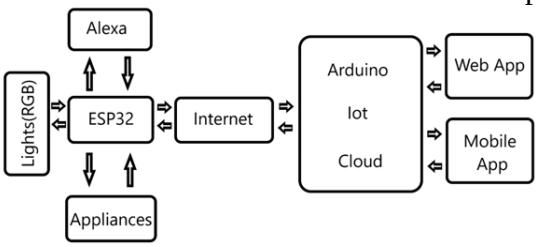
Abstract:
Due of its many advantages, home automation is a topic that is gaining popularity. Home automation can be achieved by simply connecting electrical household gadgets to the internet or cloud storage. Due to its low cost and increasing simplicity, network enabled home automation is currently in high demand. Through the use of specifically designed portals, platforms based on cloud computing help to connect users to the environment's residents, making it simple to access anything and everything at any time and anywhere. We wish to automate and connect household appliances to the internet. We wish to include dimmable rgb led lights with 256-bit colour presets, smart switches to turn on and off electrical appliances, and programmable rgb led lights. And, if possible, connectivity to alexa. The controller used will be an esp32 wroom 32d. And the cloud infrastructure used will be the iot cloud driven by arduino. To control the entire system, a web dashboard and an android app will be used.

Keywords:home automation, alexa ,arduino cloud,bluetooth.

Introduction

Due of its many advantages, home automation is a topic that is gaining popularity. Home automation can be achieved by simply connecting electrical household gadgets to the internet or cloud storage. Due to its low cost and increasing simplicity, network enabled home automation is currently in high demand. Through the use of specifically designed portals, platforms based on cloud computing help to connect users to the environment's residents, making it simple to access anything and everything at any time and anywhere. We wish to automate and connect household appliances to the internet.



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We want to remotely control the entire system using a smartphone app with interactive software. Where the device's behavior in the real world is influenced by mobile actions. We would like to merge voice commands and smart home assistant, if possible.

Objectives of the system

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The main objective of the project is to control the devices from the app from anywhere and create a smart home automation even the devices are not smart devices.

Hardware components used

- Esp32 wroom module
- Hcsr501- passive ir motion sensor
- Dht11–temperature and humidity sensor
- Mq2 smoke and gas sensor
- Ac wall sockets and plugs
- Plastic casing
- 8- channel relay module
- Ac to dc converter (2a)
- Connecting wire

Software components used: -

- Arduino ide
- Arduino iot cloud remote

Esp32 wroom module

Three outstations are included with a micro servo, two of which are for power supply and one of which is for signal input. The unheroic, red, and brown cables are included in the tiny servo of my kind. Brown for negative power force, unheroic for signal input, and red for positive power force. Gnd will be the negative power force from the detector, while vcc will be the positive power force. For transmitting and entering echo signals, tig and echo will be used. D9 leg from an arduino nano is what i'm utilizing to control a mini servo's gyration. I'm utilizing the d2 and d3 legs to regulate the transmission and entering of ultrasonic detector signals. The nano's 5 volt and ground boards will correspond to positive and negative power forces. Also, a usb power source may be used to power this design.

Hcsr501- passive ir motion sensor

Three outstations are included with a micro servo, two of which are for power supply and one of which is for signal input. The unheroic, red, and brown cables are included in the tiny servo of my kind. Brown for negative power force, unheroic for signal input, and red for positive power force. Gnd will be the negative power force from the detector, while vcc will be the positive power force. For transmitting and entering echo signals, tig and echo will be used. D9 leg from an arduino nano is what i'm utilizing to control a mini servo's gyration. I'm utilizing the d2 and d3 legs to regulate the transmission and entering of ultrasonic detector signals. The nano's 5 volt and ground boards will correspond to positive and negative power forces. Also, a usb power source may be used to power this design. The graphic below shows the genuine picture of the hc- sr04sensor, which consists of two formations of circles. When power is provided, one end of these rings broadcasts ultrasonic signals

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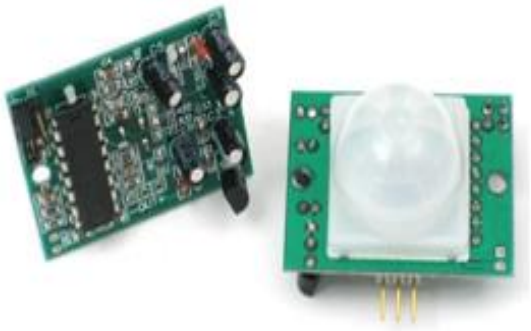
with a 15 cm accuracy range; if it detects any obstructions, the waves strike the impediment and return to the transmitter end. Our project is only one of the numerous applications for this little module.



Dht11 – temperature and humidity sensor

Dht11 is a low- cost digital detector for seeing temperature and moisture. This detector can be fluently connived with any micro-controller similar as arduino, raspberry pi etc. To measure moisture and temperature presently. Dht11 moisture and temperature detector is available as a detector and as a module. The difference between this detector and module is the pull- up resistor and a power- on led. Dht11 is a relative moisture detector.

Mq2 smoke and gas sensor

This detects if there are any harmful gasses near the system or if in case of any fire this sensor can detect the fire and sends is to the user.

ac wall sockets and plugs

ac wall plug socket

Plastic casing

all of the electronics must be protected in any project or product. The plastic encasing and holding all of a system's components are called cases. Its portability and safety are considerably increased by this.these cases might be custom-made or pre-made. Most often, blow molding or injection molding is employed in these situations.

8- channel relay module

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Ac to dc converter (2a)

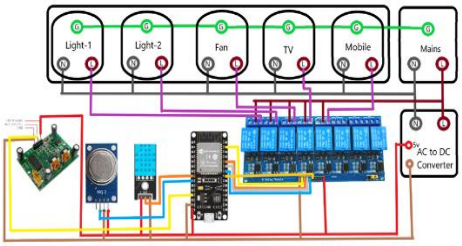
Power source: ac-dc, 220v-5v safety features for temperature, overcurrent, and short circuits are present in the transformer module. Great accuracy, safety, stability, and reliability. Extremely low volume, consistent output voltage, simple installation, etc. Widely utilized in electronic systems for post-processing, telecommunications, industrial control, fire control, and signal control.

connectingwire

these are used to connect with parts in the module.

Circuit diagram:

Arduino iot cloud remote.



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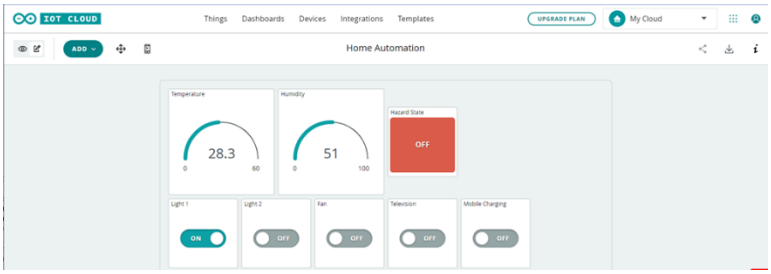
circuit working:-

- The system first converts the ac supply to dc 5v output. To power the dc 5v components.
- The system then runs the connection code and tries to connect to the wi-fi.
- The system will try until it is successful. And then tries to connect to the arduino iot cloud.
- It establishes secure connection with arduino cloud.

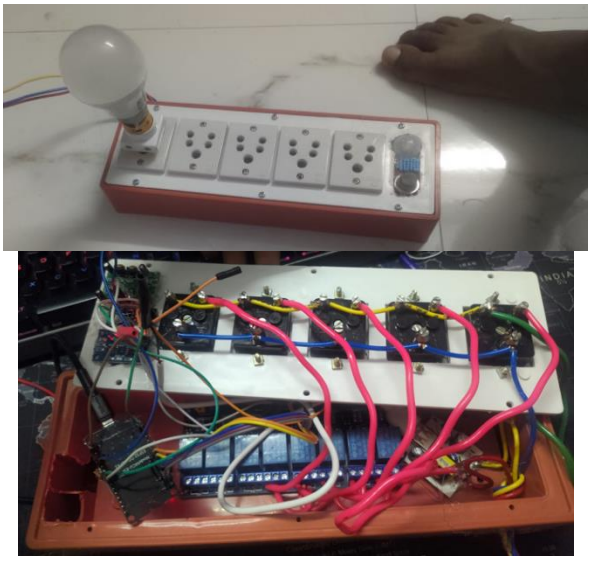


- The status of the relays and devices get updated in a timely manner. And the commands in cloud are stored so, that they can be passed on to the devices whenever they come online.
- The user gets the temperature and humidity data along with smoke notification in the app.The system detects a fire through the smoke sensor and switches off all the electrical systems.
- The motion sensor detects the presence of the people in the room and keeps the appliances on. If there is no movement the appliances will be automatically switched off.
- The pir sensor is calibrated in such a way that the device will get switched off after a 30 min non active period.
- The sensitivity of the pir sensor can also be calibrated manually by the user, to control the actuation threshold.

implementation and result

1.dashboard:

2.deactivated stage (light off):



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3.activated stage (light on):
The system is successfully working with all features.
Inside of the device:

Applications

- Home automation
- Automation of offices
- Home security
- Creating better enterprise solutions. ...
- Integrating smarter homes. ...
- Innovating agriculture. ...
- Building smarter cities. ...

Acknowledgment

We wish to express our deep sense of gratitude to our internal guide mr dr.t.ramaswamy and project coordinator dr. Sn. Chandrasekhar, assistant professor (ece) who have taken great care in the project work undertaken, by devoting his valuable time in advising and guiding us at each phase, leading to successful completion of our project work. It has been an educative and enlightening experience working with him. We are greatly indebted to prof. Dr. S.p.v subba rao, head of the department of electronics and communication for providing valuable guidance at every stage of this project work. We are thankful to our principal dr. T. Ch. Siva reddy for providing valuable guidance and support at every stage of this project work. We are profoundly grateful to our director dr. C. V. Tomy and college authorities for helping us in completing our project work. We would also like to thank all our faculty members and staff who supported us completing the project work.

Conclusion

The home robotization using internet of effects has been experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successfully controlled ever through internet. The designed system not only monitors the detector data, like temperature, gas, light, stir detectors, but also actuates a process according to the demand, for illustration switching on the light when it gets dark. It also stores the detector parameters in the pall (gmail) in a timely manner. This will help the stoner to dissect the condition of colorful parameters in the home anytime anywhere.

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