INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542

Touch Switches and Advance Flexible Home Automation System based on IoT

Adesh Bansod[1], Shivani Burade[2], Mitali Khidkikar[3], Vaishnavi Chawde[4], Nagma Sheikh[5]

Student, Tulsiramji Gaikwad-Patil College of Engineering and Technology, Nagpur, Maharashtra, India[1,2,3,4]

Assistant Professor, Tulsiramji Gaikwad-Patil College of Engineering and Technology, Nagpur, Maharashtra[5]

ABSTRACT: As everything getting advance day by day, everyone is giving very importance to their safety and security and demanding smart homes with full security and alert system for this we are introducing this project where old switchboard panels are replaced by touch switch panels by this, we can easily control home appliances through one common device from a remote location and get the status of our home via the internet which make our home not only advance but also safe and secure.

KEYWORDS: NodeMuc, TTP223, Internet of Things, Blynk app

I. INTRODUCTION

There is associate degree increasing demand for sensible homes wherever appliances react mechanically and might be simply controlled through one common device for saving time, security, and safety. The recent-age switches area unit slowly obtaining replaced by bit switches as a result of with old switches their area unit ample issues sort of a tangency, shock, aged and physically disabled folks face ample issues to work, etc. folks still use ancient switch panels as a result of the advanced switch panel is sort of expensive and every one folks cannot provide to possess it. To beat of these issues this device is extremely helpful.

This device has 2 modules, module one consists of bit switches, and module two consists of a sophisticated home automation system this module is extremely versatile. We are able to use module one as a traditional bit switch and if we've to work our appliances from a foreign location then we've to attach module two with module one, then we are able to simply operate our appliances from a foreign location employing a connected device with the assistance of IoT. Every device is versatile in order that in any case module one and module two get broken then the operator doesn't have to be compelled to replace the complete device they'll take away the broken module and replace it with a replacement one.

II. LITERATU RE REVIEW

Internet of things-based home automation is the easiest way to associate appliances and make the home more secure and safe. The maximum number of systems are focus on so many different technologies and the new system gets introduced. In the following papers, there are different technologies areused.

[1] Smart switchboard using touch and voice commands. The authors wanted to make this system secure and safe for physically handicapped people. In this home automation system, they use the DIP processor for the recognition of the human voice. The home appliances get controlled by the human voice and commands and for making the switch on and off there is a relay and microcontroller is used. Also, the purpose of making this system is to control the voltage levels for example the speed of thefan.

[2] Mobile-based a home automation using the internet of things. In this home automation system, the author had used a mobile phone with Java capabilities, a cellular modem, and the home server. A home server is used to controlling the home appliances according to user commands which are given by mobile phones via the cellular modem. This system is very efficient and cost-effective. The main purpose is to make the system smart by using asmartphone.

[3] Bluetooth-based home automation using Arduino and android application. In this system, the smartphone is connected through Bluetooth and when the Bluetooth is on the mobile sends the signal to the system for making the

switchon/offandforcontrollinghomeappliances.ItwillgetcontrolthroughtheBluetoothinterface.Themainobjective ofthisprojecttomakeanautomationsystemthatcanbeeasilycontrolledbyanandroidappconnectedwithaBluetooth.

III. SYSTEMOVERVIEW

Due to advancements in a technology day by day, old switch panels are slowly replacing with an advanced touch

switch panel. This not only provides a beautiful and cool look to the home but also provides too many facilities and a security to our home. This is a physical touch plus a wireless operating feature. The main aim of this project is to make the expensive device on an affordable budget with the advancement of the flexibility of the device so that if a module 1 or a module 2 gets damage then not to worry simply we can replace the touch switch or a controller part. The below figure shows the block diagram of Touch Switch's and an Advance a Flexible Home Automation System.
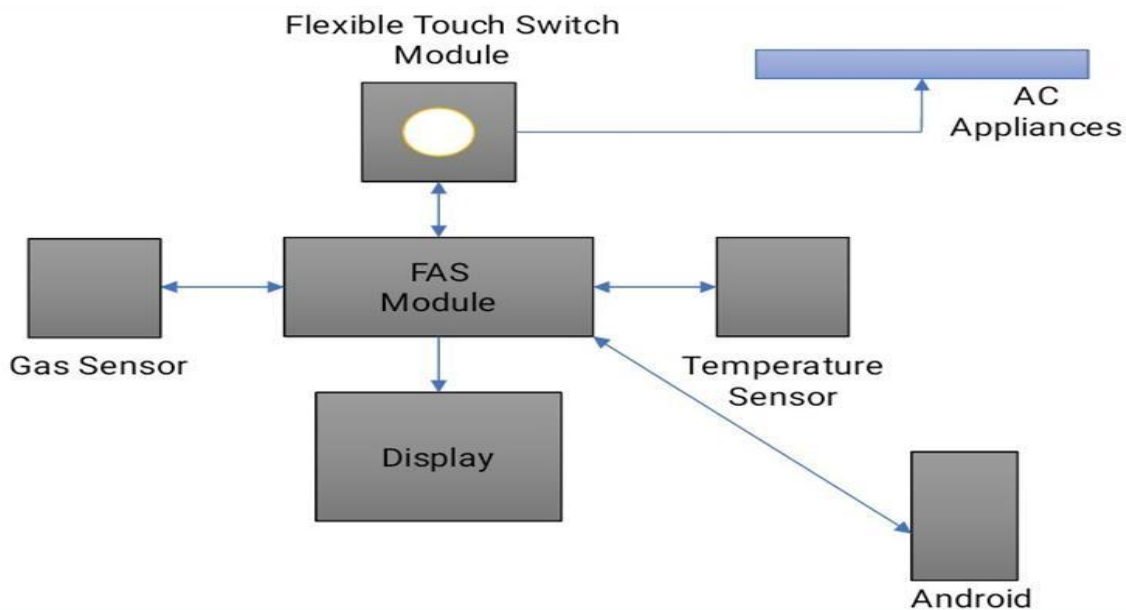

Fig. 1 Block Diagram of Touch Switches and Advanced Flexible Home Automation System

In this we are using NodeMuc, Relay, TTP223 Touch switch, OLED Display, EX-OR Gate, Gas Sensor, and DHT11. This device has features like sensing the temperature of a room, a gas leakage, and display on the attached screen and your mobile device.

IV. HARDWARES

A.   NodeMuc:-

Nodemcu is an ASCII text file LUA-based a computer code developed for the ESP8266 Wi-Fi chip. By exploring a practicality with the ESP8266 chip, Nodemcu a computer code comes with the ESP8266 Development board/kit i.e., Nodemcu Development board. Each the computer code and prototyping board styles AR an open supply. The prototyping a hardware generally used could be a card functioning as twin in-line package (DIP) that integrates an USB controller with a smaller surface-mounted a board containing the MCU and an antenna. The selection of the DIP format permits for a straightforward prototyping on breadboards.

Fig.2.   NodeMuc (ESP8266)

B.Touch Sensor:-

The physical phenomenon is inching a small amount switch module relies on a small amount look Associate in a Nursing IC (TTP223B). Generally, it outputs a coffee level with low-power consumption mode. If there is slightly around the sensing an area, the module will Associate in a Nursing output a high level; consequently, the mode is switched to a fast mode. Alongside your finger removing from the sensing an area for 12s, the mode is switched back to low-power consumptionmode.
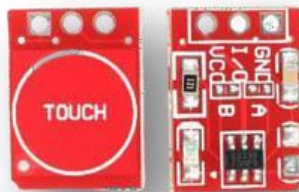

Fig.3.   Touch Sensor(TTP223)

B.   Relay:-

The SPDT Relay(30A) could be high-quality Single Pole Double Throw Relay (SPDT). The Relay consists of a coil, one common terminal, one an unremarkable closed terminal, and one an unremarkably open terminal. Once the coil of the relay is at a rest (not energized), the common terminal and therefore the unremarkable closed terminal has continuity.

Fig.4.   Relay(SPDT)

C.   Transistor: -

BC547 may be a Bipolar electronic transistor, abbreviated as BJT. It's an associate degree NPN a junction transistor. It's 3 terminals named an electrode. A BC547 is an associate degree NPN a junction transistor thence the collector and an electrode are left open (Reverse biased) once the bottom pin is a command at the bottom and can be closed (Forward biased) once a sign is provided to the bottom pin. BC547 encompasses gain worth of one hundred ten to 800, this worth determines the amplification capability of the junctiontransistor.

Fig.5.   Transistor (BC547)

EX-OR Gate:-

XOR gate (sometimes EOR, or EX-OR and pronounced as Exclusive OR) may be a digital computer circuit that offering real (1 or HIGH) an output once the quantity of true inputs is odd. An associate in a Nursing gate implements an associate in a nursing exclusive or; that's, a real output result if one, and only 1, of the inputs to the gate is true. If each input is false (0/LOW) or each is really a false output result. XOR represents the difference performs, i.e., the output is true if the inputs aren't alike otherwise the output is fake. How to recollect XOR is "must has one or the opposite however not both". XOR can even be viewed as an addition modulo two. As a result, XOR gates are wont to implement binary addition in computers. 0.5 an adder consists of an associate in a Nursing gate Associate in a nursing a logic gate. Different uses embrace subtractors, comparators, and controlled inverters.

Fig.6.   EX-OR Gate (IC7486)

D.   Display:-

An organic semiconductor diode (OLED or organic LED), additionally referred to as organic electroluminescent (organic EL) diode, could be a semiconductor diode (LED) during which the emissive electroluminescent layer could be a film of compound that emits lightweight in response to an electrical current. This organic layer is set between 2 electrodes; usually, a minimum of one among these electrodes is clear. OLEDs square measure want to produce digital displays in devices like tv screens, laptop monitors, moveable systems like smartphones, hand-held game consoles, and PDAs. a significant space of analysis is that the development of white OLED devices to be used in solid-state lighting applications.
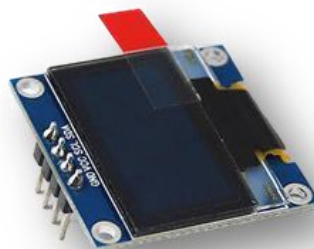
Fig.7.   Display(OLED)

E.   Temperature Sensor:-

The DHT11 could be a basic, ultra-low-cost digital temperature and humidness sensing element. It uses an electrical

phenomenon humidness sensing element and a semiconductor to live the encircling air and spits out a digital signal on
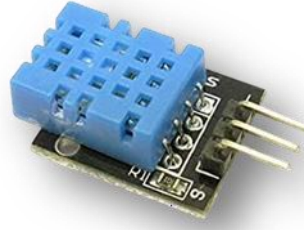

Fig.8.   Temperature Sensor(DHT11)

the info pin (no analog input pins needed). It's fairly easy to use however needs careful temporal arrangement to grab knowledge. You'll be able to get new knowledge from it once each a pair of seconds, therefore once exploitation the library from Adafruit, sensing element readings are often up to a pair of seconds recent. Comes with a four.7K or 10K electrical device, that you'll need to use as a pullup from the info pin to VCC.

F.   Gas Sensor:-

The MQ-2 a Gas detector will observe or live gasses like LPG, Alcohol, Propane, Hydrogen, CO, and an even methane series. The module version of this detector comes with digital Pin that makes this detector operate even while not a microcontroller which comes in handy after your area unit is solely making an attempt to observe one specific gas. Once it involves a measure the gas in a ppm the analog pin has got to be used, the analog pin is additionally TTL driven and works on 5V and thence will be used with most typicalmicrocontrollers.
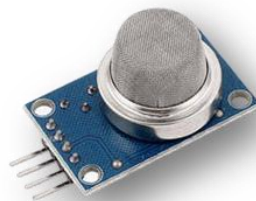

Fig.9.   Gas Sensor(MQ-2)

V.   RESULT AND DISCUSSION

A.   Module 1:
This is a touch switch with the help of this touch switch home appliances will control manually by touching on the board. If we tap once on the sensing area then the appliance gets switch 'ON' and when we tap again on the sensing area then the appliance gets switch'OFF'.

B.   Module 2:
This is module 2 which works remotely from anywhere by smartphone after connecting module 2 with module 1 touch switches control with the help of a connected device or mobile phone from a remote location using the Blynk app. By simply adding no. of connection or application and controlling them all each application personally.

VI.   RESULT AND DISCUSSION

In the previous bit, a switch Panel Board System user has got to a modification the total system if any circuit or a hardware injury. To beat this, we tend to a style 2 totally different individual modules for the house automation switch system. This module provides flexibility, simple to repair, a shockproof, and additionally management from far-off location. The most barrier towards the acceptance of the home automation presently is its high price. By an exploitation Nodemcu and also the IoT platform, this device is often created efficient. Simple to work this device with the assistance of the Blynk app that may be a common and free platform. With this device, individuals will a simply management their homeappliances.

SOME OF THE ADVANAGES FROM THE ABOVE RESULTS

a)   Make Home Safe andSecure.
b)   Low-CostDevice.
c)   FlexibleDevice.
d)   Easy toOperate.
e)   Easy toInstall.
f)   Easy toRepair.
g)   Shock Proof.

REFERENCES

[1] G. Indira Devi, D. ChandraMouli,B.   Venkatesh, Dr. E. Laxmi Lydia, P. Nagaraja, K. Sathesh Kumar, "Design of smart Arduino touch switch panel for smart home using IoT," 2020 Journal of critical reviews, ISSN 2394-5125, vol. 7, July2020.

[2] Home automation IEEE PAPER 2017- engineering researchpapers_https://www.engpaper.com

[3] M. Asadullah and K. Ullah, 2017. Smart home automation system using Bluetooth technology, 2017 International Conference on Innovations in Electrical Engineering and Computational Technologies (ICIEECT), p.1.

[4] V. Puri and A. Nayyar, "Real-time smart home automation based on PIC microcontroller, Bluetooth and Android technology," 2016 3rd International Conference on Computing for Sustainable Global Development, New Delhi, 2016, pp.1478-1484.

[5] R. K. Kodali and S. Soratkal, 2016, "MQTT based home automation system using ESP8266," IEEE Region 10 Humanitarian Technology Conference (R10-HTC),p.1.

[6] R. K. Kodali, V. Jain, S. Bose and L. Boppana, 2016. "IoT based smart security and home automation system," International Conference on Computing, Communication and Automation (ICCCA), p.1286.

[7] D. Pavithra and R. Balakrishnan, "IoT based monitoring and control system for home automation," 2015 Global Conference on Communication Technologies (GCCT), Thuckalay, 2015, pp. 169-173, doi:10.1109/GCCT.2015.7342646.

[8] R. Piyare and M. Tazil, 2011, "Bluetooth based home automation system using a cell phone," IEEE 15th International Symposium on Consumer Electronics (ISCE), p.192.

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 7.542

doi® crossref

ISSN
INTERNATIONAL STANDARD SERIAL NUMBER
INDIA

निस्केयर
NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Scan to save the contact details