

IOT Based Home Automation using Raspberry Pi

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Abstract: Availability on high pace cellular networks like 3G,4G or Long Term Evolution united with cheaper or handy clever phones, cell industry has considered a vast increase between terms on presenting a number of purposes yet capabilities at the fingertips on the citizens. It discusses respecting IoT or such may remain chronic because realizing clever domestic automation using RaspberryPi. Smart telephone is connecting along Raspberry Pi the usage of the IP address over Raspberry Pi via Wi-Fi.

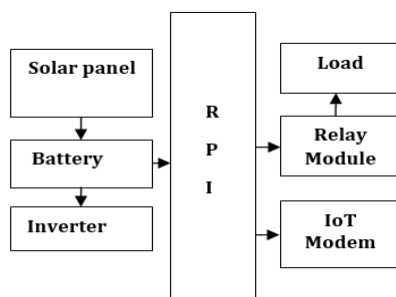
The law effectively overcomes the drawbacks in Bluetooth then ZIGBEE technology. Internet regarding Things (IoT) is some of the hopeful technologies as may stand back because of connecting, IPaddress.Applications ranging beside smart governance, clever education, clever agriculture, clever healthcare, smart home etc. execute usage IoT because of fine transport concerning applications without guide intervention in a more high-quality manner.

Keywords: It discusses respecting IoT or such may remain chronic because realizing clever domestic automation using RaspberryPi.

I. INTRODUCTION

Today, Internet utility improvement calls for is very excessive. So IoT is a prime generation with the aid of which we can produce numerous beneficial net programs. Basically, IoT is a community wherein all bodily items are linked to the internet thru network devices or routers and alternate information. . An Internet is an evolving entity. It commenced because the “Internet of Computers.” Researches have forecast an explosive growth within the range of “matters” or gadgets on the route to be related to the Internet. The resulting network is known as the “Internet of Things” (IoT).

II. BLOCK DIAGRAM



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III.IOT (Internet Of Things)

The Internet of Things (IoT) can be described as a interconnection of physical gadgets or people referred to as "things" which might be embedded with software program, electronics, community, and sensors which permits these items to gather and alternate information.

The goal of IoT is to extend to internet connectivity from popular devices like pc, cell, pill to highly dumb gadgets like a toaster. IoT makes clearly the whole lot "smart," with the aid of improving factors of our existence with the strength of facts collection, AI set of rules, and networks.

Home Automation:

Correspondence assumes a significant job in this home mechanization design required for the controlled methods of the particular assignments. This brilliant technical innovation in miscellaneous manner develops ceaseless checking through video reconnaissance with cameras, booking, and vitality sparing tasks.

This is the best arrangement in any event, for the old and the debilitated people to work types of gear.



IV.EMBEDDED SYSTEM

Embedded structures do a very precise assignment, they will not be program embedded to do different things. Embedded structures have very restrained resources, in particular the reminiscence. Generally, they do no longer have secondary storage gadgets which includes the CDROM or the floppy disk. Embedded systems have to paintings towards some time limits. A unique process has to be finished inside a particular time. In a few embedded structures, known as actual-time structures, the cut-off dates are stringent. Missing a deadline may purpose a catastrophe-loss of life or damage to property. Embedded structures are confined for strength. As many embedded structures operate via a battery, the electricity intake needs to be very low.

V. RASPBERRY PI

Raspberry Pi additionally gives on-chip SPI, I2C, I2S and UART modules. There are different versions of raspberry pi available as listed below:



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1. Raspberry Pi 1 Model A
2. Raspberry Pi 1 Model A+
3. Raspberry Pi 1 Model B
4. Raspberry Pi 1 Model B+
5. Raspberry Pi 2 Model B
6. Raspberry Pi 3 Model B
7. Raspberry Pi Zero

It is utilized for to transmit a video of uncompression or advanced TV sound information to the Computer Monitor, Digital TV, and so forth. By and large, this HDMI port interfaces Raspberry Pi to the Digital TV.

GPIO Pins of Raspberry Pi 3 are shown in below figure:

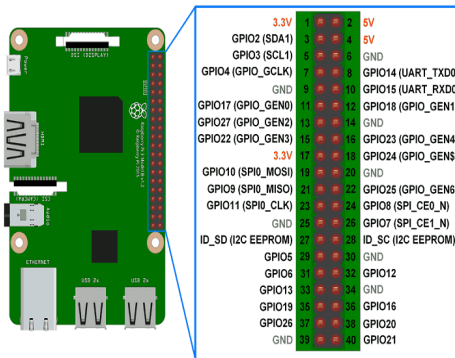
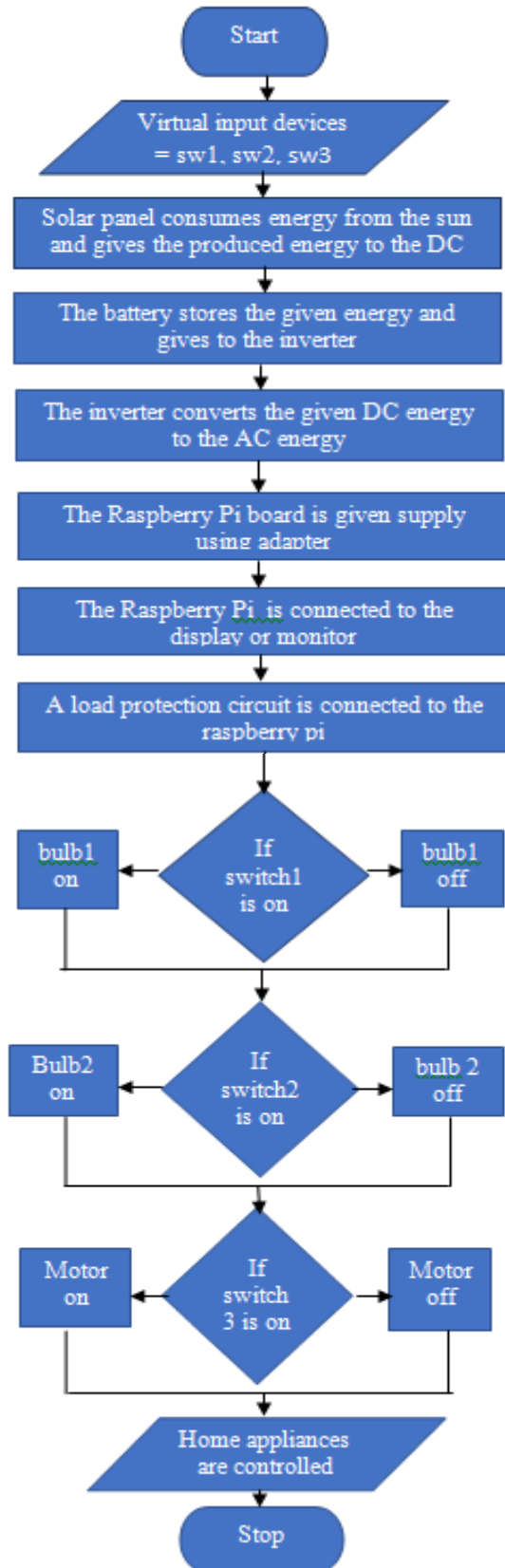


Fig6.2. Raspberry Pi 3 Model B GPIO Pins

VI.ALGORITHM

- Step 1:**
Solar panel consumes energy from the sun and gives the produced energy to the DC battery
- Step 2:**
The battery stores the given energy and gives to the inverter
- Step 3:**
The inverter converts the given DC energy to the AC energy
- Step 4:**
The AC energy is given to the relays for excitation
- Step 5:**
The Raspberry Pi board is given supply using adapter
- Step 6:**
A load protection circuit is connected to the raspberry pi
- Step 7:**
The relays are connected to load protection circuit to get indirectly connected to raspberry pi.
- Step 8:**
Three virtual switches are connected to raspberry pi through blynkapp (IOT cloud) to control the electrical appliances
- Step 9:**
The relays are connected to the electrical appliances
- Step 10:**
If
Switch1 is on, bulb1 is on
Switch1 is off, bulb1 is off
Switch2 is on, bulb2 is on
Switch2 is off, bulb2 is off
Switch3 is on, motor is on
Switch3 is off, motor is off

VII. FLOW CHART



VIII. INVERTER

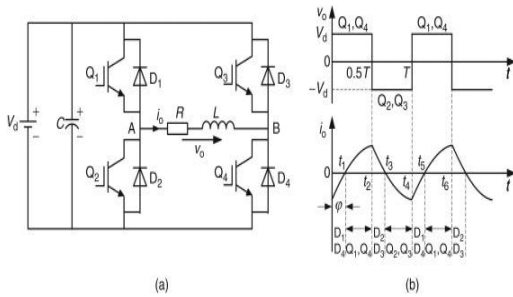


Fig: single phase inverter and its waveforms

Here we used single phase inverter to control and convert the dc supply into ac supply which is generated from solar panel.

IX. HARDWARE & RESULTS



Fig.9.1. hardware implementation

Solar Panel Readings

Condition	DC voltage(v)
Dark	0.2 - 1
Medium light	4.5 - 6
Bright light	8 - 9

Various Voltage and Current Reading Values Of Loads:

Number of loads connected	Single load		Double load		Multi load	
	Output Voltage		Output Voltage		Output Voltage	
Bulb 1	108.9volts	9.1 mA	106.3 volts	9.5 mA	107.4 volts	9.3 mA
Bulb 2	0 volts	0	105.9 volts	9.44 mA	106.9 volts	9.35 mA
Motor	0 volts	0	0 volts	0	106.4 volts	28.19mA

X. CONCLUSION

The house automation the usage of internet of things has been practically established to paintings satisfactorily by way of connecting easy appliances to it and the appliances have been efficaciously controlled remotely thru net. as an example switching on the mild whilst it receives dark. It also

shops the sensor parameters inside the cloud in a well timed way

FUTURE SCOPE

The home automation destiny could be very wide. We can add so many variety of new facilitated capabilities in it to make it greener in future to meet user requirements. Following we have some capabilities below.

1. Home safety device is going wi-fi
2. It may be operated through voice command
3. person can upload new appliances without external experts

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