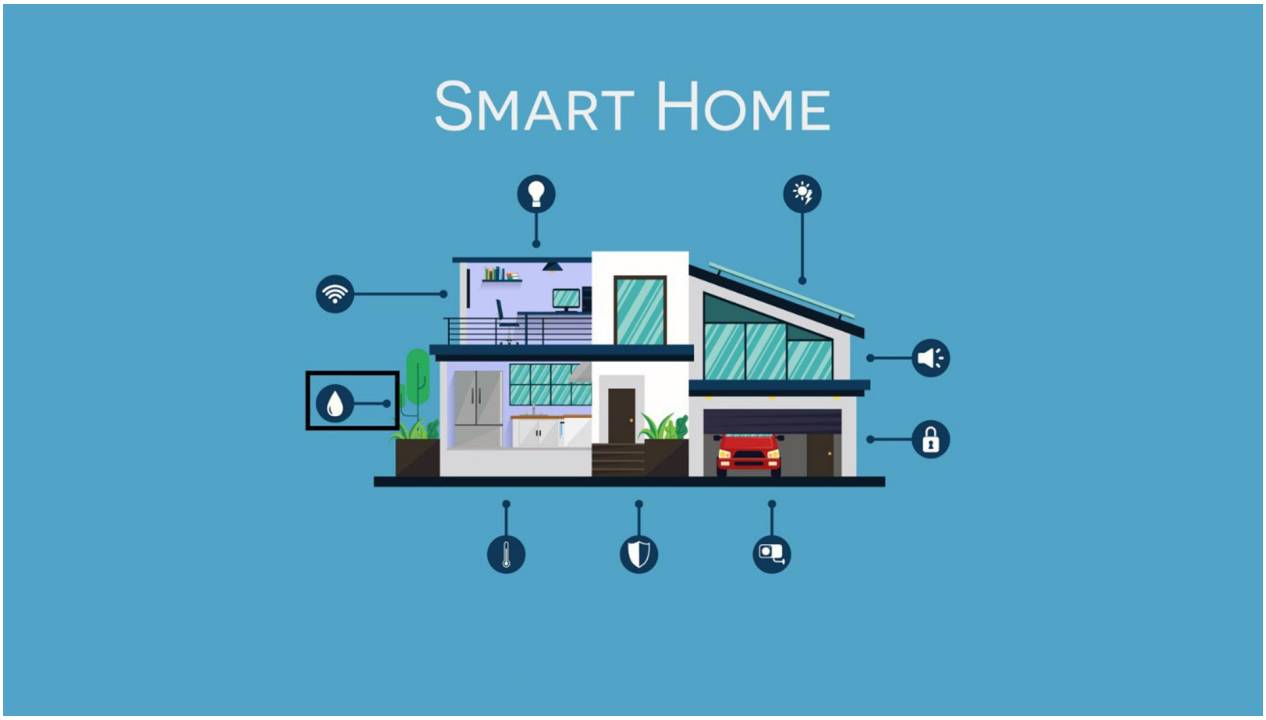

WAVE SENSOR

29-09-2022

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UTTAR PRADESH, 201310

ABSTRACT

OBJECTIVE - To create an affordable contactless switch

BENEFICIARIES - doctors (necessity) , hospitals(necessity) ,hotels (luxury), consumers (automation).

VALUE OF RESULTS - It can be a revolutionary product for the smart India project.

BACKGROUND

1. During COVID-19, When everyone was facing a hard time, in-home, a switch was accessed by all with bare hands and ignored that it can be a medium of transfer of the virus. This idea aroused my mind at that time.
2. Every child faces at least once in his/her childhood, an electric shock by inserting a finger into a switchboard which can be a threat to his/her life.

PROBLEM STATEMENT

Designing a commercially viable touchless switch circuit that can be utilized in multiple products, having low cost and high reliability.

RESEARCH

- ## PRESENT METHODS
    1. Toggle switch (tik-tok)
    2. Capacitive touch switch
    3. IR control switch
- ## PROPOSED SOLUTION

    To design a gesture control switch using IR technology. In this product, we tend to exploit the TOF (time of light) concept used in IR proximity sensors.

    To detect the motion of the user's hand.

    Using decimal counter as the main toggling IC. we have designed a very reliable, inexpensive, and compact touchless switch. With a working range of 20 to 50 mm.

ALTERNATE SOLUTIONS

1. Capacitive touch-based sensor as a proximity sensor.

   A capacitive touch sensor when used as a proximity sensor needs a more complex design and offers a very low range of operation. Due to its complex circuit design, its cost is high, and capacitive proximity sensors do not provide a large operating range as provided by IR proximity sensors. While an IR proximity sensor can operate from 20-50 mm, capacitive proximity sensors can work from 0-20 mm only.

2. ALEXA/GOOGLE controlled IOT switch.

   Although IoT switches are becoming more and more popular the cost associated with them is too high for general users from tier two and tier three cities to accept it.

3. IR remote-controlled switch.

   IR remote-based switches do increase the controlling range but also pose a new problem of an additional remote. When the remote is lost or not working or in breakdown mode, all of the switches will fall under a breakdown situation as there will be no means to control them. In addition to the installed hardware user needs to take care of the remote also. Even though it might be less expensive than the above two but extra handling of the remote makes it unpopular among the consumer race.

NOVELTY OF APPROACH

Our system is based on passive components rather than any microcontroller or microprocessor. Hence it reduces the cost by a huge factor. Due to its lack of dependence on a microcontroller or microprocessor, it is more robust and more reliable in extreme conditions. As per the cost, its cost is so low that it does not need to be prepared and can be replaced easily.

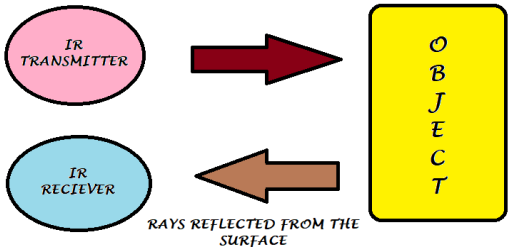
Noice filter circuits have been used in our project. Hence eliminating the false triggering of the circuit.

TECHNICAL REPORT

Fine-tuned IR proximity sensor with various protection circuits and noise cancellation circuits.

The working of IR proximity sensor is as follows:

IR LED emits IR rays of a particular wavelength. The basic concept of an Infrared proximity Sensor which is used as an Obstacle detector is to transmit an infrared signal, this infrared signal bounces from the surface of an object, and the signal is received at the infrared receiver.

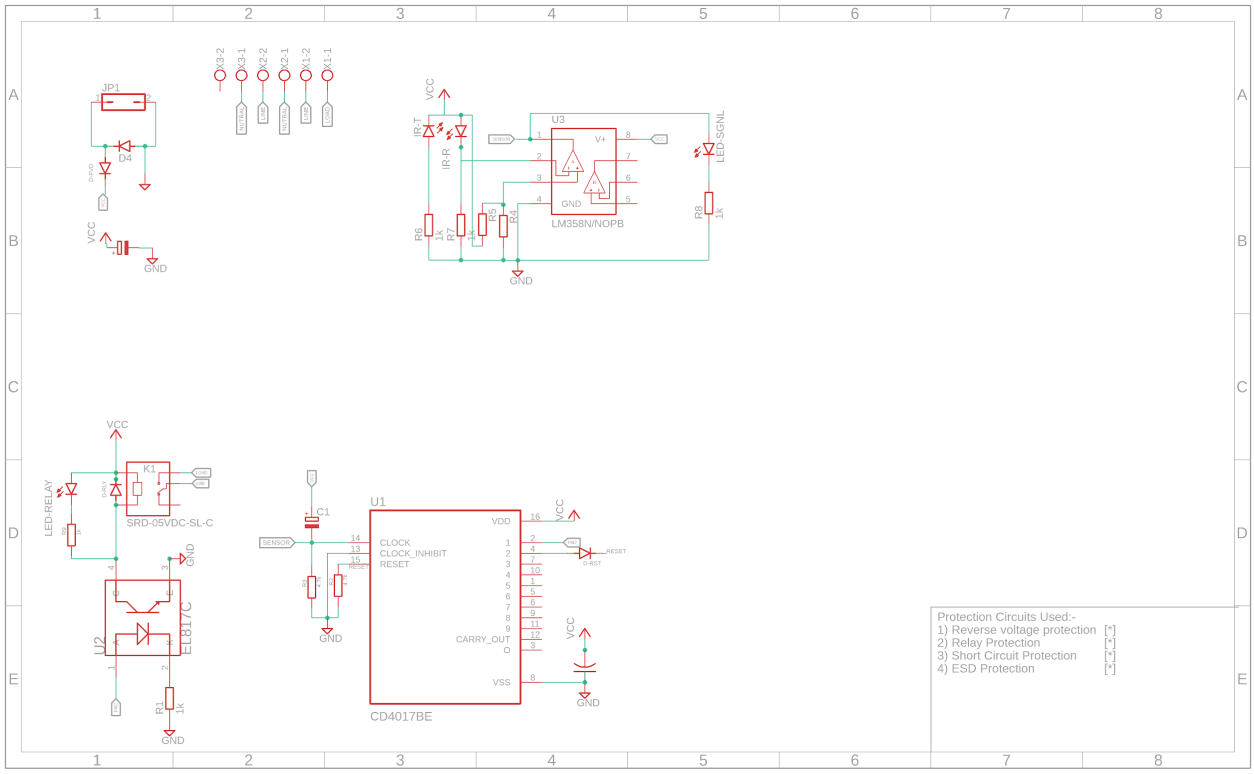


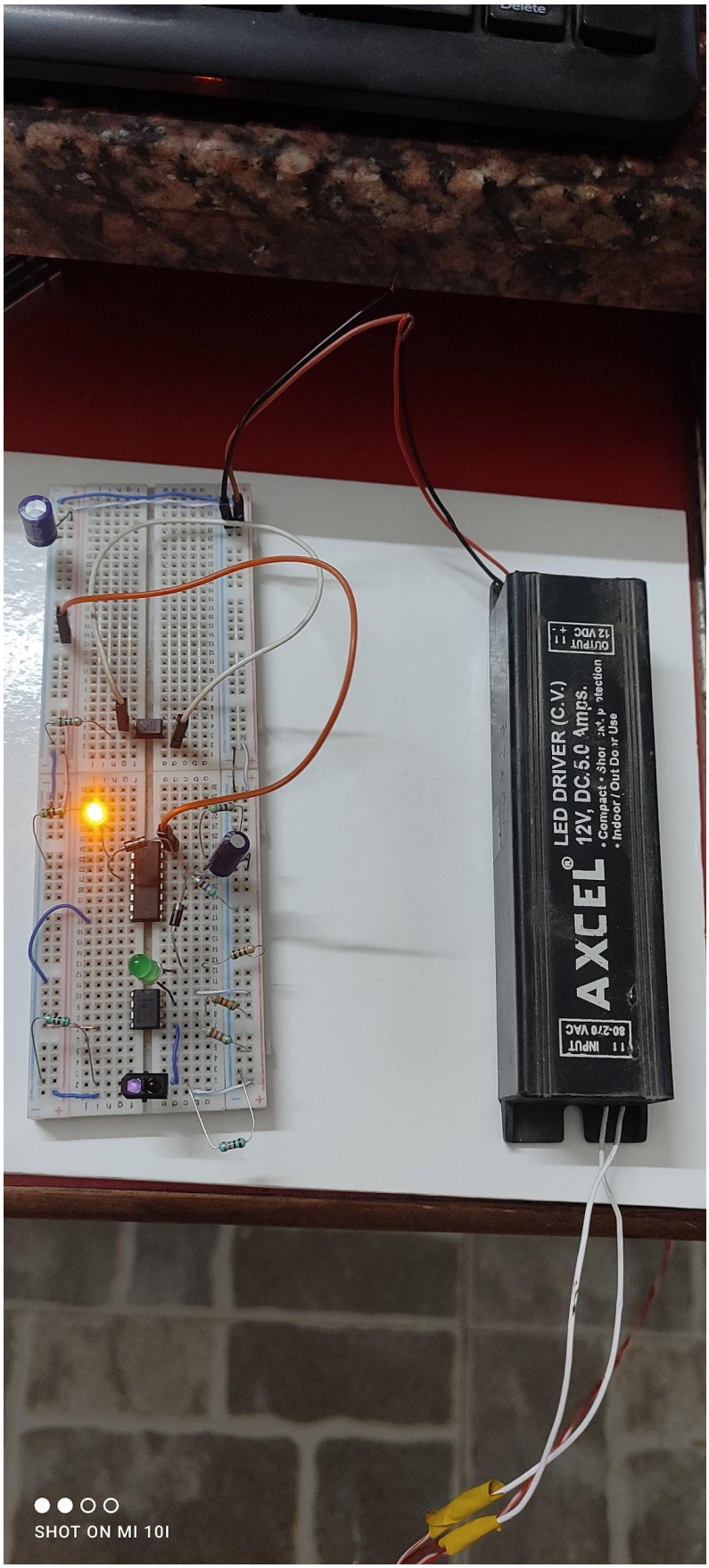
LINK TO THE GOOGLE DRIVE

https://drive.google.com/file/d/1v8nqcT3ukWsgkHAWjd26HWNCTzsxrX7u/view?usp=drivesdk

The above link is the link to a video of the prototype (working model).

FINAL PROTOTYPE CREATION




AXCEL
LED DRIVER (C.V.)
12V, DC.5.0 Amps.
INPUT
OUTPUT
SHOT ON MI 10I

RESULTS

When we wave our hand over the sensor, the LED turns on, and when we wave back, the LED turns off by IR proximity sensor.

APPLICATIONS

MY IDEA AS A SOLUTION TO THE PROBLEM:-

This wave switch is touchless. Can be installed easily in smart homes.

ADDITIONAL APPLICATIONS:-

BENEFITS TO THE USER:-

- Cheap and easily replaceable
- Affordable
- Compact size
- Adjustable range
- Contactless switch

FUTURE PROSPECTS AND FURTHER DEVELOPMENT