

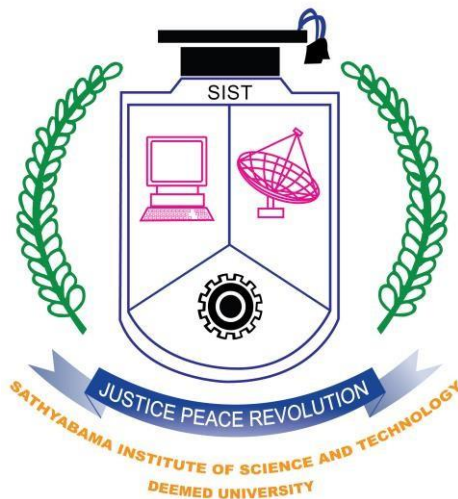
SOLAR MOSQUITO POWER GUARD WITH CAUTIONS

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering Degree in
Electrical and Electronics Engineering

By

Anush.S (38140008)

Telferd Jude Nicholas Hawes (38140058)



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade “A” by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

MAY 2022



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **ANUSH.S** (Reg. No. 3140008) and **Telferd Jude Nicholas Hawes** (Reg. No. 38140058) who carried out the project entitled "**SOLAR MOSQUITO POWER GUARD WITH CAUTIONS**" under our supervision from Dec 2021 to MAY 2022.

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Submitted for Viva voce Examination held on _____

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DECLARATION

We **ANUSH.S** (Reg. No. 38140008) and **Telferd Jude Nicholas Hawes** (Reg. No. 38140058) hereby declare that the Project Report entitled “**SOLAR MOSQUITO POWER GUARD WITH CAUTIONS**” done by us under the guidance of **Dr. V .Senthil Nayagam** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering Degree in Electrical and Electronics Engineering.

1.



2.



DATE:

PLACE:

SIGNATURE OF THE CANDIDATES

ACKNOWLEDGEMENT

We are pleased to acknowledge our sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. We are grateful to them.

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We wish to express our thanks to all Teaching and Non-teaching staff members of the Department of Electrical and Electronics Engineering who were helpful in many ways for the completion of the project.

ABSTRACT

Modifying the concept of a Mosquito Bat to thereby bring about the Mosquito Power Guard which can be attached as a Window/Door for Commercial and Industrial Purposes. It consists of a Solar Panel which is connected to solar charge controller which is also connected to a 4V Battery. To develop a project under the domain Embedded Systems and Power Electronics with innovative creation of a Mosquito Power Guard and to ensure safety with precautions measures. Battery which has a voltage sensor connected with it. The Battery is then connected with a potentiometer and a Dual Channel relay and is connected to the Mosquito power inverter circuit. The AC input from EB line is given to full wave bridge rectifier converter circuit which converts AC to DC and is also given to another Dual channel Relay and is connected to the Mosquito power Inverter circuit as well thus being able to use AC supply when present and using the backup supply from Battery when required. The relay is connected with the Microcontroller (Arduino Uno) to which a LCD Display, an Ultrasonic Sensor is connected. The Mosquito power Inverter circuit is connected to the mesh of the Window/Door. The Window/Door consists of three mesh layers which are separated by two insulators in between to prevent the mesh from coming in contact. The Mosquito Power inverter Circuit converts the DC supply to AC and Steps up the voltage alone and is given to the mesh. A Mosquito or Insect is killed when it comes in contact with the mesh. By using the ultrasonic sensor it recognizes any living being when it comes into particular range of the Window/Door thereby cutting of the power Supply and with the help of the LCD display it also gives a pre-warning. By this we can ensure that the insects or mosquitos can be eliminated without having any harm to people.

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CHAPTER 1

INTRODUCTION

GENERAL

The size of the mosquitoes are unit little however they are available in giant varieties and these small pests continue to grow with their number of the population notwithstanding what proportion human try and eliminate them. A cool manner of avenging humans by eliminating these "devils" through electrocution. Mosquitos' are unit a giant threat to mankind and these are unit gift in each corner of the globe. Now a days many techniques on the market within the market that has with the choices of obtaining obviate these insects, some are unit within the type of sprays, some are unit within the type of coils and mats that require to be burned. Because of the cytotoxic nature of those chemical based mostly variants that either displace or kill pests. Gratuitous to mention, if these chemicals have the potentials of harming the pests they'd do a similar to U.S.A. on a smaller scale, however though, within the long haul, they might cause important health hazards. For that reason, a dipteron swatter bat was designed. A dipteron window may be a device used for killing mosquitoes victimisation high voltages. The dipteron window are unit in numerous shapes and sizes however carries with it a similar basic building block specifically: a high voltage generating circuit, a mesh internet assembly, influences provide unit and an effect device. Something that comes straightforward invariably possesses some hidden drawbacks and dangers. Here too, though the dipteron killing mesh style appearance undemanding, the mesh network is control utterly exposed to associate degree accidental human. So, among several reasons, the most one is to create such form of dipteron killer window device for the window by reducing the high voltage pondering the welfare and safety of the individuals.

ABSTRACT

The aim of this work is to form associate automatic and cheap dipteran killing device which can facilitate to save lots of human life from sting that is chargeable for making non-invented medication diseases. This paper illustrates a concept of easy however good dipteran killing window system. Because of the electrocution between the mesh structures of the device, mosquitoes yet as insects are instantly killed once they can attempt to build their method through the window. Compared to out there dipteran killing bat within the market, this method can inhibition low voltage that's enough to kill dipteran and if some person close to by nets radical sonic perceived and switch off the ability offer which means not harmful for person. This method uses microcontroller, ATmega328p that receives information from the adapter associated helps to live the input current and voltage that is displayed in an digital display show (16*2) by employing a logic rule code. It conjointly consists of an influence offer unit and solar panel that is especially wont to charge the battery. The controls area unit created by motor vehicle switch mistreatment relay.

BLOCK DIAGRAM OF PROPOSED SYSTEM

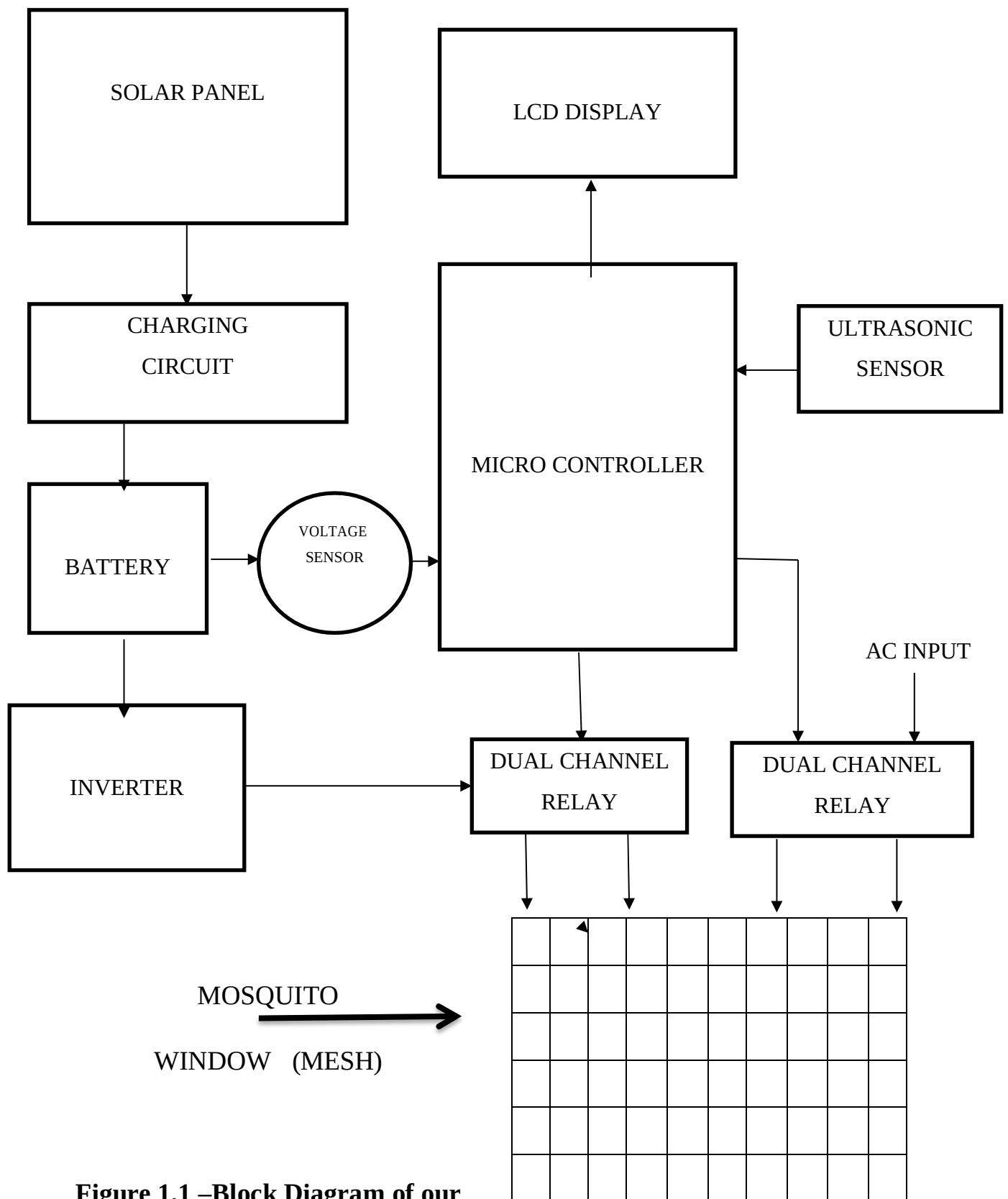


Figure 1.1 –Block Diagram of our proposed system

The Figure 1.1 shown above is the Block Diagram of our proposed system .The block diagram depicts two paths which are given to the window mesh. One path starts with the solar panel which is then connected to a charging circuit which is then given to the battery. The battery has a voltage sensor connected with it. The voltage sensor is then connected with the Arduino UNO. The connection from the battery is then given to an Inverter circuit which is then given to a Dual Channel relay. This dual channel relay is connected to the Arduino UNO and this output is given to the window mesh. This is one path of the Circuit. Another path of the circuit starts from the AC supply which is given to another Dual Channel relay which is also connected to the Arduino UNO and its output is also given to the window mesh. Hence these are the two paths of the circuit which both finally is given to the window mesh. Some other components which are present are the LCD display and the Ultrasonic sensor which is interfaced with the Arduino UNO as well. The LCD display helps to display the Data which is programmed to be displayed and the Ultrasonic sensor is used to detect any living being/thing within the programmed distance and helps to cut off the supply if it comes within the programmed distance. The two paths are present for power shortage purposes the window is initially powered using the AC supply from the EB line and in case of power shortage or power outage the solar path acts as a backup to provide supply to the window mesh. Hence this is the explanation and the working of the Block diagram.

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

1. MICRO CONTROLLER
2. ULTRASONIC SENSOR
3. DUAL CHANNEL RELAY
4. LCD DISPLAY
5. CHARGING CIRCUIT
6. BATTERY
7. SOLOR PANNEL
8. POWER SUPPLY

SOFTWARE TOOLS

1. ARDUINO IDE
2. EMBEDDED C

EXISTING SYSTEMS TECHNIQUE

1. MOSQUITO BAT
2. INSECT KILLER

MOSQUITO BAT

The racket could be a device accustomed kill two-winged insects the user waves the racket around to catch a mosquito between the metal grid, which shorts the circuit and electrocutes the insect. A Taiwanese creator, Tsao-I Shih, is usually attributable with inventing the trendy two-winged insects' racket; he filed for a patent for Associate in nursing "electronic insect-killing swatter" in 1996. The device is very well-liked in tropical countries like Republic of India, wherever mosquitos square measure a nuisance and liable for spreading fatal diseases like protozoal infection and dandy fever. The racket offers an efficient different to different two-winged insect repelling/killing solutions; it doesn't use harmful chemicals or need costly refills, doesn't manufacture smoke or fumes, and ensures that the insect is dead.

There square measure several brands and variations of the racket accessible within the market. The cost of our racket for ₹400 and it comes with a 4V 600 mAh reversible lead acid battery and outputs a most of 2400 V at the mesh. The racket is formed by Akari, an organization based mostly in urban centre. Most of the rackets accessible within the Indian market square measure created in China.

1. Product specifications:
2. Dimensions: 530 x 220 x 30 millimetres

INSECT KILLER

Insect killer is intended to stop and destroy flying insects and prevents them from going in the room, food process or the other space. Insect killer works on the principle of hypnotisms and attracts the insects towards the sunshine tubes of the unit and also the insects die instantly on contact with the electrically charged grid. The dead insect's square measure collected within the structure receptacle provided at all-time low for straightforward disposal. The unit is straightforward to put in with low maintenance price and zip consumables needed for operation and square measure accessible in several models to suit customer's demand.

The options 2 high intensity 10 watt ultraviolet bulbs that pull all teasing flying insect into the device. Insects then create contact with a very powerful high voltage electrically charged metal grid, instantly killing them. Kills a limitless quantity of insects.

Keep your house and eating place free from mosquitos, insects and different unwanted pest's victimization the Hygiene 40W Jumbo Flying Insect Killer. This insect killer machine includes a slim style and emits lightweight [ultraviolet illumination| UV | actinic radiation | actinic ray} light to draw in and kill all flying insects, pests and flies. The ultraviolet illumination light - emitting diodes in its accustomed irradiate the optimized ultraviolet wavelength to draw in the mosquitoes. It is a trustworthy bug electrical device to assist you so you will not be full of two-winged insect's bites, fly buzz and sleep in peace. The machine is formed of high-quality internal elements, therefore Hygiene 40W elephantine Flying Insect Killer will operate smoothly during any time, day or night.

EXISTING SYSTEM OVERVIEW

The higher than declared issues area unit corrected within the new planned system. The most important advantage of this technique is that it is often operated over the net. This technique may be set to show on and off at a selected time-frame. This technique uses 3 totally different strategies to kill mosquitoes. This is often done by employing an unbearable detector, lightweight [ultraviolet illumination | UV | actinic radiation | actinic ray} light and electrical fence, DC fan and a dipterous insect liquidator. All the information of the devices operation are often half-track by the terminal within the raspberry pi exploitation net of Things (IoT) technology. The developed device include four units that area unit as follows i)

unbearable frequency generation unit ii) lightweight [ultraviolet illumination | UV | actinic radiation | actinic ray} light and electrical fence iii) DC fan iv) liquidator dipterous insect. The devices utilized in this technique would basically be identical because the once utilized in our day to day life with some of various parts just like the unbearable frequency generator and DC fan. The unbearable frequency generator used produces short and high frequency pulses at totally different time intervals. These time intervals are often set by the user supported the necessity by modifying the code. The DC fan is employed as dipterous insect lure to drag the mosquitoes into the electrical fence. The lightweight [ultraviolet illumination | UV | actinic radiation | actinic ray} light is placed behind the electrical fence to draw in the mosquitoes. once the mosquitoes get contact with the electrical fence, they get zapped.

LITERATURE REVIEW

TITLE: Style and Construction of a Tripler Circuit for a two-winged insect's electrical device.

YEAR: 2016.

AUTHORS: M. Alpha., Jummai .D. Makama

This work is aimed toward reducing the quantity of mosquitoes through the utilization of physics. The work entails the look and construction of a high voltage Tripler circuit for a two-winged insect's electrical device which might electrocute mosquitoes. It conjointly consists of an influence offer unit that is principally accustomed charge the battery. The mesh dimension is 33cm by 23cm and had one inner mesh with 2 outer ones. The controls are created of a button and two and a couple of and a pair of} a mini switches and has 2 indicators for charging and power

TITLE: IOT Based Smart Mosquito Killing System.

YEAR: 2019

AUTHORS: P. Vijayakumar, C. Akshith Reddy

As mosquito's square measure one amongst primary supply that prompts because alarming maladies. Alteration the dipteran world is more and more essential notably in inhabited nation. Various mosquitoes cause health problem like viscus illness, dengue fever and then on. thus on kill these diseases, people square measure utilizing various cures like artificial anti-agents that cause increment in circulatory strain and what is more mental meltdown. Projected good dipteran killing framework, does not build any type of mischief people. As this framework is innocuous to people because it produces inaudible sound waves. The repeat scope of inaudible sound waves is over twenty kilocycles that square measure indiscernible to individuals. The inaudible sound rushes of repeat scope of forty kilocycle square measure perceptible to mosquitoes and totally different bugs. Whenever mosquitoes and totally different creepy crawlies impart, they perpetually sense inaudible sound waves; they get aggravated and square measure compelled to manoeuvre aloof from that region. This framework is often viably accustomed lure and obliterates mosquitoes from various spots like colleges, parks, college's grounds and associations. Projected framework lessens the amount of inhabitants within the mosquitoes by utilizing ultraviolet {light | ultraviolet illumination | UV | actinic radiation | actinic ray} light, electrical fence and inaudible sensing element. Projected system would be worked utilizing web site utilizing internet. A raspberry pi aboard inaudible sensing element, electrical fence driver, and DC fan square measure used. So as to drag within the mosquitoes ultraviolet {light | ultraviolet illumination | UV | actinic radiation | actinic ray} light is used aboard that automation is being dead within the projected framework it's a value effective approach and is moveable. Projected system is going to be actualised and it demonstrates that device can kill up to thirty fifth of mosquitoes.

TITLE: Use of Mosquito Repellent Devices- Problems and Prospects.

YEAR: 2017

AUTHORS: Prathyusha Kantheti, Ratna Kamari D

Mosquito repellents square measure substances that square measure designed to create surfaces unpleasant or unattractive to mosquitoes. They usually contain associate active ingredient that repels mosquitos as well as secondary ingredients, that aid in delivery and cosmetic charm. They square measure accessible in several forms, from creams to lotions to oils, however square measure most frequently sold-out as aerosol product. Historically,

varied varieties of substances are wont to repel mosquitoes. These embody such things as smoke, plant extracts, oils, tars, and mud. As insect repellent technology became additional subtle, individual compounds were discovered and isolated. This allowed the formulation of latest, additional economical varieties of Dipteral repellents. A survey conducted on thirty respondents to apprehend regarding completely different types of Dipteral repellents used by them associated the potency of those Dipteral repellents in yucky dipterous has verified that majority of the respondents use mosquito repellent liquid vaporizers as an effective approach of yucky mosquitoes inside each throughout daytime and dark. Dipteran repellent lotions and creams, Dipteral repellent patches/stickers, Dipteral repellent gels like roll on it will be applied to garment and nets for doors and windows were rated because the best repelled by majority of respondents followed by Dipteral repellent quick cards

PROPOSED SYSTEM

The mesh Circuit functions by the following principles; once the facility is switched on, the relay can On Associate in Nursing Off and intrinsically permits the battery current to be switched to and from the centre tapped electrical device that sees the voltage as an AC Voltage. This voltage is induced into the heart beat electrical device secondary winding through magnetic attraction induction. And as a result of the electrical device is in step down mode, the voltage is faded to present Associate in Nursing output that once tripled produces the specified voltage that may electrocute a bug or insect. The output of the Tripled is connected to two meshes whereby the inner mesh referred to as the recent mesh carries the high voltage whereas the outer meshes carry a ground potential. If the facility offer is cut or off the DC battery can mechanically on by another relay. Some persons come back close to by mesh the facility offer of the mesh is mechanically off by exploitation extremist sonic.

ADVANTAGES OF PROPOSED TECHNIQUE

1. This innovative power guard as doors or windows of our homes and other such places.
2. It can kill the insects/ mosquitos before entering the premises thereby avoiding various sickness and diseases.

3. By the concept of green energy source we will be using solar source for power backup.
4. It will be ensuring 100% safety from electrical shocks.
5. The sensor and buzzer also helps as additional safety features.
6. In case of any short circuit or any fault in the circuit, the relay being used will cut off the total power supply to the mesh.
7. The components and mesh materials which are used in this mosquito power guard are water resistant and withstand any climatic temperatures.

CHAPTER 2

PROJECT DESCRIPTION

INTRODUCTION

The size of the mosquitoes as little however they are available in massive ranges and these small pests continue to grow with their number of the population in spite of what quantity human try and eliminate them. A cool approach of avenging humans by eliminating these "devils" through electrocution. Mosquitoes as a giant threat to human race and these as gift in each corner of the globe. Nowadays, lots of techniques obtainable within the market that gives with the choices of obtaining eliminate these insects, some as within the variety of sprays, some as within the variety of coils and mats that require to be burned. Because of the toxic ant nature of those chemical primarily based variants that either chase away or kill pests. Unneeded to mention, if these chemicals have the potentials of harming the pests they might do a similar to US on a smaller scale, however though, within the long-standing time, they might cause important health hazards. For that reason, a Diptera swatter bat was designed. A Diptera window may be a device used for killing mosquitoes' victimization high voltages. The Diptera window as in numerous shapes and sizes however carries with it a similar basic building block specifically: a high voltage generating circuit, a mesh internet assembly, an influence offer unit and an impression device. Something that comes straightforward invariably possesses some hidden drawbacks and dangers. Here too, though the Dipteral killing mesh style appearance simple, the mesh network is control fully exposed to Associate in Nursing accidental human. So, among several reasons, the most one is to create such style of Diptera killer window device for the window by reducing the high voltage considering the welfare and safety of the individuals.

SOFTWARE TOOLS

1. .ARDUINO IDE
2. EMBEDDED C

ARDUINO UNO

DESCRIPTION

Arduino is an open-source hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects capable of sensing and control objects in the physical world. Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino's boards are able to read light input on a sensor, a finger on a button, or a Twitter message and turn it into an output by activating a motor, lighting an LED, posting something online. The Arduino UNO is a microcontroller board based on the ATmega328 (data sheet). It has 14 digital input/output pins (6 of which can be used as PWM outputs), analog inputs, 16 MHz crystal oscillator, USB connection, power socket, an ICSP header, and a reset button.



Figure 2.1 –An Arduino UNO BOARD

ARDUINO UNO

The Figure 2.1 shown above is the image of the Arduino UNO. Arduino is an open source project that created kits based on microcontrollers for building digital devices and interactive objects capable of sensing and controlling physical devices. The project is based on microcontroller board designs, produced by different vendors, using different microcontrollers. These systems provide sets of digital and analog input/output (I/O) pins that

can interface with various expansion boards (called shields) and other circuitry. The cards have serial communication interfaces, including Universal Serial Bus (USB) on some models, for loading programs from personal computers. For programming microcontrollers, the Arduino project provides an integrated development environment (IDE) based on a programming language called processing, which also supports C and C++ languages.

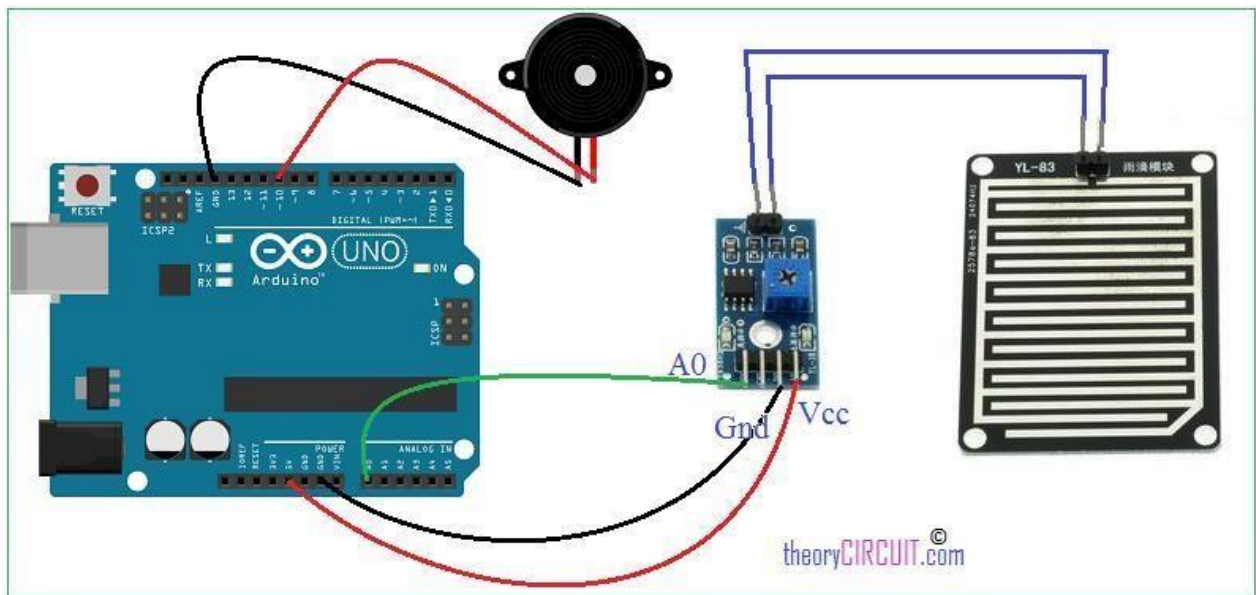


Figure 2.2 –An example diagram showing of an Arduino UNO interfacing with sensor and buzzer

ARDUINO UNO INTERFACE WITH SENSOR & BUZZER

The Figure 2.2 shown above is an example diagram which illustrates how an Arduino UNO is interfaced with a sensor and a buzzer. Arduino Uno may be a microcontroller board supported the ATmega328P. It has 14 digital input/output pins (6 of which can be used as PWM outputs), 6 analog inputs, 16 MHz quartz, USB connection, power socket, an ICSP header, and a Reset button. Contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC to DC adapter. Arduino Uno has a Number of functions to communicate with a computer, another Arduino board or other Microcontrollers.

FEATURES

1. Microcontroller: ATmega328P
2. Operating voltage: 5V
3. Input voltage: 7-12V
4. Flash memory: 32KB
5. SRAM: 2KB
6. EEPROM: 1KB

APPLICATIONS

1. Real time biometrics
2. Robotic applications
3. Academic applications

ATMEGA328 IC

DESCRIPTION

The Figure 2.3 depicted below is the Atmega 328p IC which is used in the Arduino UNO. The ATmega328 is a single-chip microcontroller developed by Atmel in the Mega-AVR family. Atmel's 8-bit AVR RISC-based microcontroller combines 32 KB ISP flash memory with read and write capabilities, 1 KB EEPROM, 2 KB SRAM, 23 general-purpose I/O lines, 32 working registers, three flexible timers /counter with compare modes, internal and external interrupts, programmable serial SART, a 2-wire byte-oriented serial interface, SPI serial interface, 6-channel 10-bit A/D converter (8 channels in TQFP packages and QFN /MLF), programmable watchdog timer with internal oscillator, and five software-selectable power saving modes. The device operates between 1.85.5 volts. The device achieves a throughput of almost 1 MIPS per MHz



Figure 2.3 –Atmega328p in Arduino UNO

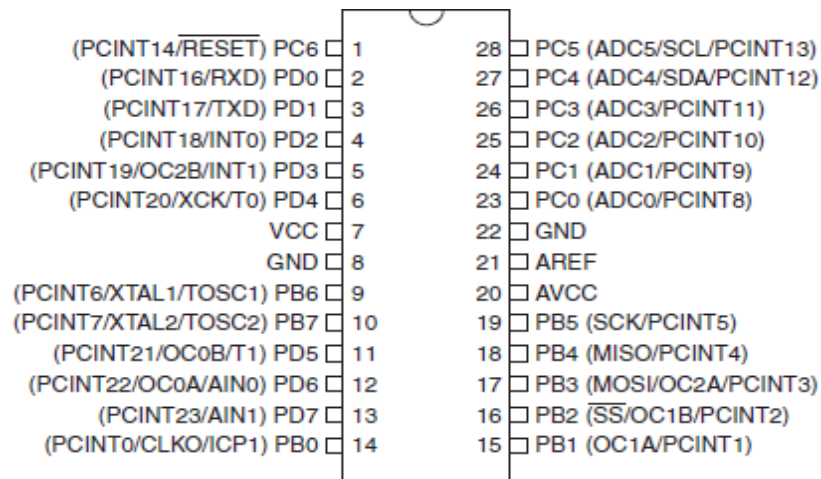


Figure 2.4 –Pin Diagram of Atmega328p IC

PIN DIAGRAM

ANALOG PORTS

DESCRIPTION

The Figure 2.4 shown above shows the pin diagram of Atmega328p IC. In electronics, an analog to digital converter (ADC, A/D, or A to D) is a system that converts an analog

signal, such as a sound picked up by a microphone or light entering a digital camera, into a digital signal. An ADC may also provide an isolated measurement, such as an electronic device that converts an input analog voltage or current to a digital number proportional **to** the magnitude of the voltage or current. In an embedded system, A/D conversion is very important as embedded systems deal with digital values; their surroundings usually occupy various analog signals. Analog signals need to be altered into digital before being treated by the microcontroller. At present, we can observe how to read an external analog signal using PIC microcontroller and exhibit the digital o/p conversion on an LCD. The i/p signal can be a varying voltage between **0 to 5V**.

1. High Performance, Low Power Atmel®AVR® 8Bit Microcontroller Family:

- Advanced RISC Architecture
- Powerful Instructions
- Most Single Clock Cycle Execution
- 32 x 8 General Purpose Working Registers
- Fully Static Operation
- Up to 20 MIPS Throughput at 20MHz
- On chip 2cycle Multiplier

2. High Endurance Nonvolatile Memory Segments :

- 3.1 4/8/16/32KBytes of System Reprogrammable Flash program memory
- 3.2 256/512/1KBytes EEPROM
- 512/1K/2KBytes Internal SRAM
- Write/Erase Cycles: 10,000 Flash/100,000 EEPROM C(1)°C/100 years at 25°Data retention: 20 years at 85
- Optional Boot Code Section with Independent Lock
- Bits System Programming by On chip Boot Program
- True Read While Write Operation
- Programming Lock for Software Security Atmel® QTouch® library support
- Capacitive touch buttons, sliders and wheels—QTouch and QMatrix® acquisition
- Up to 64 sense channels

4. Peripheral Features:

Two 8bit Timer/Counters with Separate Prescaler and Compare Mode
 One 16bit Timer/Counter with Separate Prescaler, Compare Mode, and
 Capture Mode
 Real Time Counter with Separate Oscillator
 Six PWM Channels
 8channel 10bit ADC in TQFP and QFN/MLF package
 Temperature Measurement
 6channel 10bit ADC in PDIP Package
 Temperature Measurement
 Programmable Serial USART–Master/Slave SPI Serial Interface
 Byteoriented 2wire Serial Interface (Philips I2 C compatible)
 Programmable Watchdog Timer with Separate Onchip Oscillator
 On chip Analog Comparator
 Interrupt and Wakeup on Pin Change

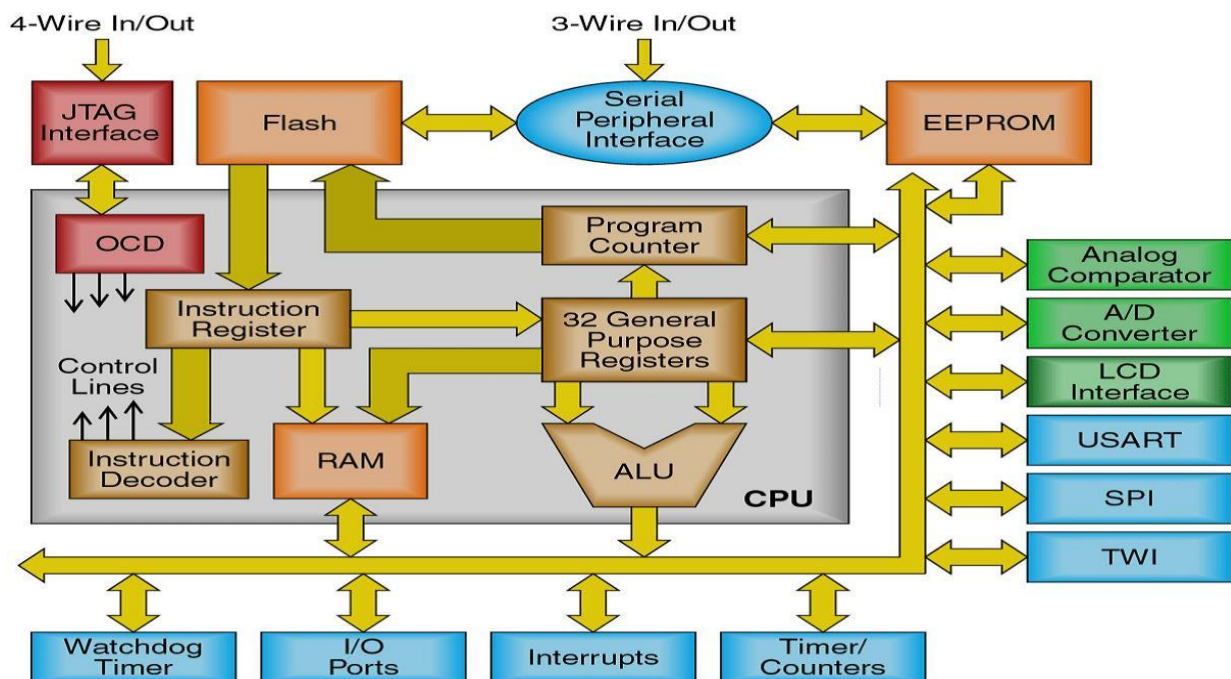


Figure 2.5 –The Architecture Diagram of Atmega328p IC

2.4 ARCHITECTURE DIAGRAM

1. The Figure 2.5 shown above shows the Architecture Diagram of Atmega328p IC
2. Special Microcontroller Features

1. Power-on Reset and Programmable Brown-out Detection
2. Internal Calibrated Oscillator
3. External and Temperature Range: -40 C° to 85°
4. Speed Grade: 0 - 4MHz@1.8 - 5.5V, 0 - 10MHz@2.7 - 5.5.V, 0 - 20MHz @ 4.5 - 5.5V C° Internal Interrupt Sources
5. Six Sleep Modes: Idle, ADC Noise Reduction, Power-save, Power-down, Standby, and Extended Standby

1. I/O and Packages

1. 23 Programmable I/O Lines
2. 28-pin PDIP, 32-lead TQFP, 28-pad QFN/MLF and 32-pad QFN/MLF

1. Operating Voltage: 1.8 - 5.5V
2. Power Consumption at 1MHz, 1.8V, 25
 1. Power-down Mode: 0.1µA
 2. Power-
 3. save Mode: 0.75µA (Including 32kHz RTC)

PIN DISCRIPTION

VCC Digital supply voltage

GND Ground.

Port B (PB7:0) XTAL1/XTAL2/TOSC1/TOSC2

Port B is an 8-bit bidirectional I/O port with internal pull-up resistors (selected for each bit). Port B output buffers have symmetric drive characteristics with high sink and source capacity. As inputs, the externally-pulled pins of port B supply power when the pull-up resistors are on. Port B pins are reset when a reset condition is triggered, even if the clock is not running. Depending on the clock select fuse setting, PB6 can be used as input for the inverting oscillator amplifier and as an input for the internal clock operating circuitry. Depending on the clock select fuse setting, PB7 can be used as the output of the inverting

oscillator amplifier. Internal calibrated RC oscillator is used as chip clock source, PB7.6 is used as TOSC21 input for asynchronous timer/counter 2 when AS2 bit is set to ASSR.

Port C (PC5:0)

(PC5:0) Port is a 7-bit bidirectional I/O port with internal pull-up resistors (selected for each bit). Port C pins that are externally pulled low supply current when the pull-up resistors are enabled. Port C pins are tested when a reset condition is triggered, even if the clock is not running.

PC6/RESET

When the RSTDISBL fuse is programmed, PC6 is used as the I/O pin. Note that the electrical characteristics of PC6 differ from those of the other pins of port C. If the RSTDISBL fuse is not programmed, PC6 is used as a reset input. A low level on this pin longer than the minimum pulse duration will result in a reset, even if the clock is not running. The minimum pulse duration is given in Table 283 on page 308. Shorter pulses are not guaranteed to result in a reset.

Port D (PD7:0)

PortDis an 8-bit bidirectional I/O port with internal pull-up resistors (selected for each bit). Port D pins that are externally pulled low supply current when the pull-up resistors are enabled. Port D pins are reset when a reset condition is triggered, even if the clock is not running.

AVCC

AVCC is the supply voltage pin for the A/D converter, PC3:0 and ADC7:6. It must be connected externally to VCC even if the ADC is not used. If the ADC is used, it must be connected to VCC through a low-pass filter. Note that PC6.4 uses digital supply voltage, VCC

AREF

AREF is the analog reference pin for the A/D Converter

ADC7:6 (TQFP and QFN/MLF Package Only)

In the TQFP and QFN/MLF package, ADC7:6 serve as analog inputs to the A/D converter. These pins are powered from the analog supply and serve as 10-bit ADC channels.

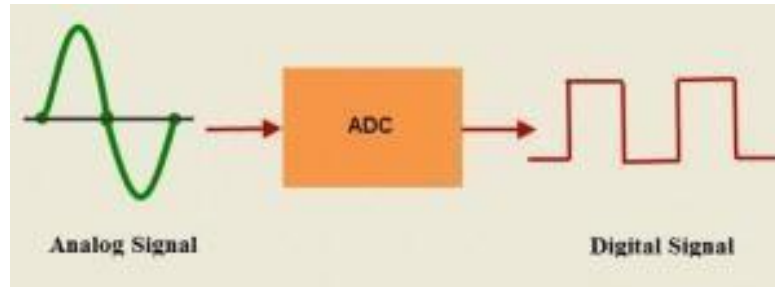


Figure 2.6 –An illustration Of an ADC Converter works

ADC Conversion

The Figure 2.6 shown above shows an illustration of how an ADC works. The Arduino UNO board has five analog input pins A0 to A5. These pins can read the signal from an analog sensor such as humidity sensor or temperature sensor and convert it to a digital value that can be read by the Microprocessor. In the Arduino world, an analog signal is simply a signal that can be HIGH (on), LOW (off), or anything in between. This means that an analog signal has a voltage value that can range from 0V to 5V (unless you mess around with the analog reference pin). Analog lets you send outputs or receive inputs on devices that operate in percent and on and off. The Arduino does this by sampling the voltage signal sent to these pins and comparing it to a voltage reference signal (5V). Depending on the voltage of the analog signal compared to the analog reference signal, the Arduino assigns the signal a numerical value between 0 (0%) and 1023 (100%). The Arduino digital system can use this number in calculations and sketches.

PWM PIN'S

DESCRIPTION

PWM stands for Pulse dimension Modulation that in itself isn't terribly helpful if you do not recognize what modulation is. Within the physical science world, modulation is

that the technique of superimposing info on a high speed signal or carrier .Average electric power. Variety of APV's use pulse dimension to manage power down below the battery's provided voltage, since most IPO packs and every one 18650 vogue batteries output three.7 volts at a nominal charge level. DC-DC may be a flat signal.

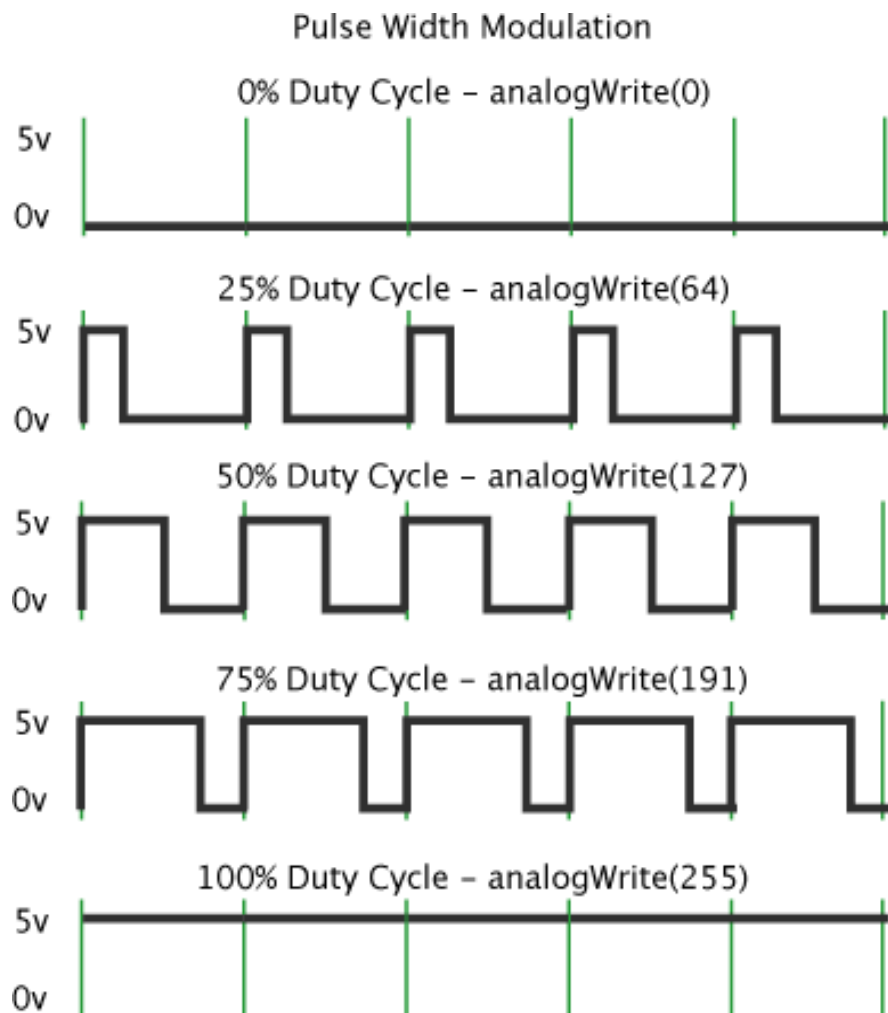


Figure 2.7 –signal illustration diagram of Pulse Width Modulation

The Figure 2.7 shown above shows the signal illustration diagram of Pulse Width Modulation. Pulse dimension modulation (PWM) may be a fancy term for describing a kind of digital signal. Pulse dimension modulation is employed in an exceedingly sort of applications together with subtle management electronic equipment. A standard approach we have a tendency to use them here at Sparked is to regulate dimming of RGB LEDs or to regulate the direction of a servo motor.

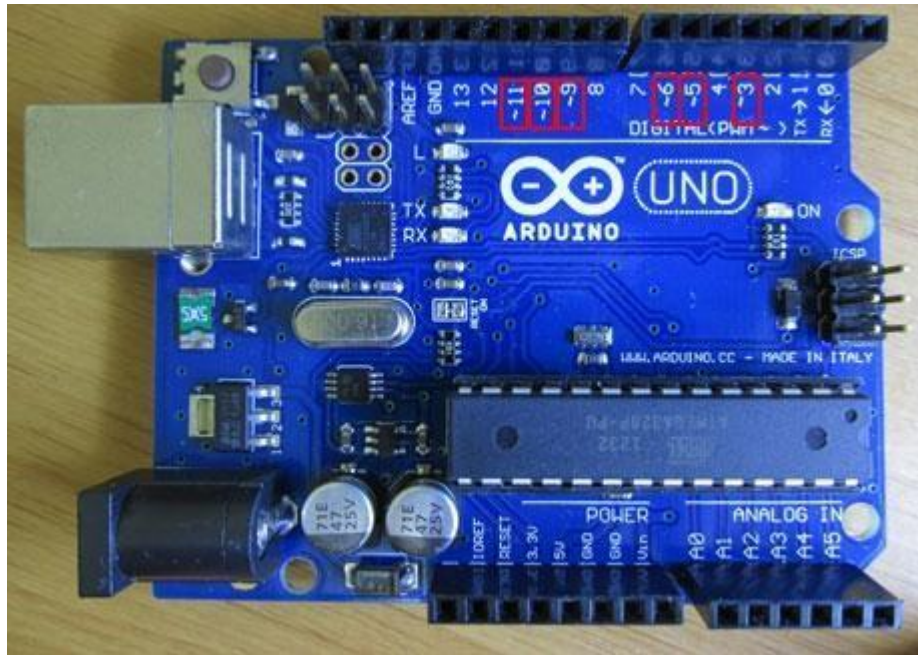


Figure 2.8 – The PWM Pins highlighted which are present in Arduino UNO

PWM PIN'S ARDUINO

The Figure 2.8 shown above shows the PWM pins which are shown highlighted on the Arduino UNO. Pulse dimension Modulation, or PWM, may be a technique for obtaining analog results with digital suggests that. Digital management is employed to make sq. wave, a proof switched between on and off. This on-off pattern will simulate voltages in between full on (5 Volts) and off (0 Volts) by dynamic the portion of the time the signal spends on versus the time that the signal spends off. The period of "on time" is termed the heartbeat dimension. To urge varied analog values, you change, or modulate, that pulse dimension. If you repeat this on-off pattern quick enough with associate junction rectifier for instance, the result's as if the signal may be a steady voltage between zero and 5v dominant the brightness of the junction rectifier. In the graphic below, the inexperienced lines represent a daily fundamental quantity. This period or amount is that the inverse of the PWM frequency. In different words, with Arduino's PWM frequency at regarding 500Hz, the inexperienced lines would live a pair of milliseconds every. A decision to analog Write () is on a scale of zero - 255, specified analogize (255) requests a 100% duty cycle (always on), and analogize (127) may be a five hundredth duty cycle (on 0.5 the time) for instance.

CHAPTER 3

HARDWARE DESCRIPTION

HARDWARE REQUIREMENTS

1. MICRO CONTROLLER
2. ULTRASONIC SENSOR
3. DUAL CHANNEL RELAY
4. LCD DISPLAY
5. CHARGING CIRCUIT
6. BATTERY
7. SOLAR PANEL
8. POWER SUPPLY

CIRCUIT DIAGRAM:

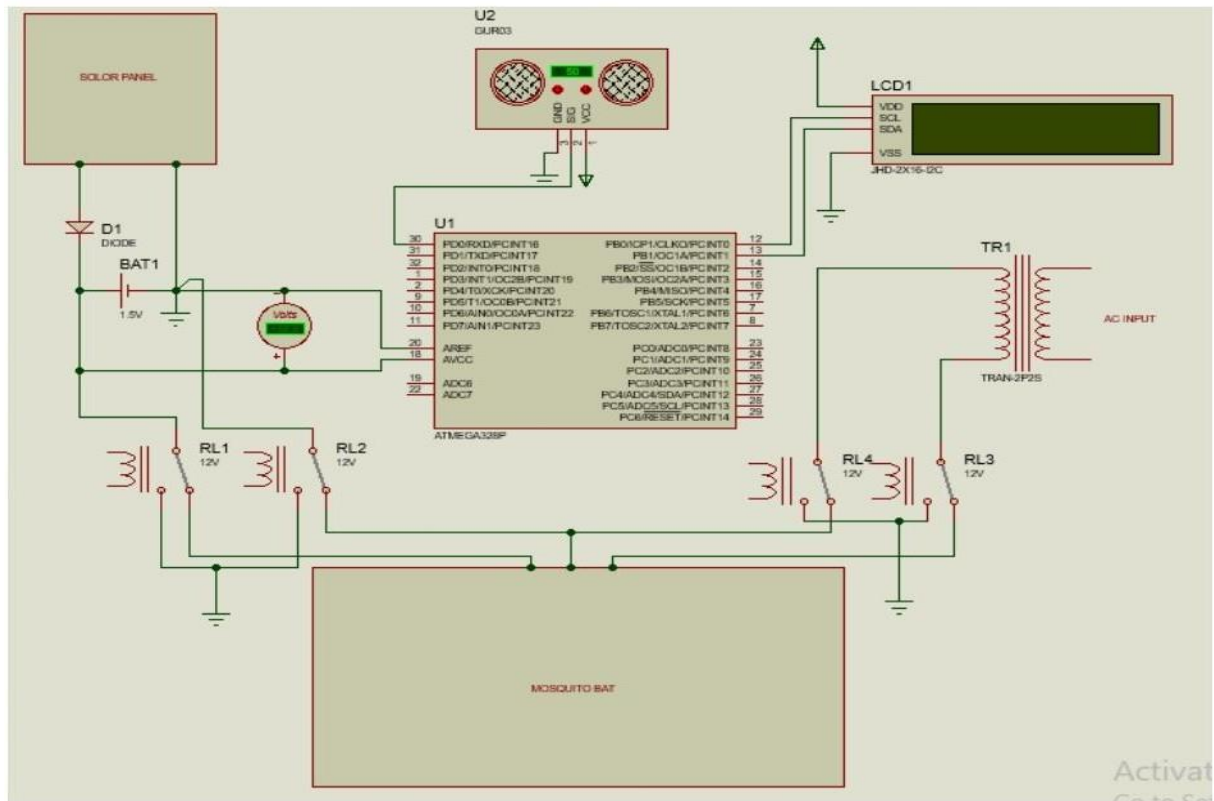


Figure 3.1 –Hardware Circuit Diagram of our proposed system

EXPLANATION OF CIRCUIT DIAGRAM

The Figure 3.1 shown above shows the Hardware Block Diagram of our proposed concept. Modifying the concept of a Mosquito Bat to thereby bring about the Mosquito Power Guard which can be attached as a Window/Door for Commercial and Industrial Purposes. It consists of a Solar Panel which is connected to solar charge controller which is also connected to a 4V Battery. To develop a project under the domain Embedded Systems and Power Electronics with innovative creation of a Mosquito Power Guard and to ensure safety with precautions measures. Battery which has a voltage sensor connected with it. The Battery is then connected with a potentiometer and a Dual Channel relay and is connected to the Mosquito power inverter circuit. The AC input from EB line is given to full wave bridge rectifier converter circuit which converts AC to DC and is also given to another Dual channel Relay and is connected to the Mosquito power Inverter circuit as well thus being able to use AC supply when present and using the backup supply from Battery when required. The relay is connected with the Microcontroller (Arduino Uno) to which a LCD Display, an Ultrasonic

Sensor is connected. The Mosquito power Inverter circuit is connected to the mesh of the Window/Door. The Window/Door consists of three mesh layers which are separated by two insulators in between to prevent the mesh from coming in contact. The Mosquito Power inverter Circuit converts the DC supply to AC and Steps up the voltage alone and is given to the mesh. A Mosquito or Insect is killed when it comes in contact with the mesh. By using the ultrasonic sensor it recognizes any living being when it comes into particular range of the Window/Door thereby cutting of the power Supply and with the help of the LCD display it also gives a pre-warning. By this we can ensure that the insects or mosquitos can be eliminated without having any harm to people.

COMPONENTS SPECIFICATIONS

REGULAT

OR

DESCRIPTI

ON

The Figure 3.2 depicted below is a voltage regulator. A voltage regulator is designed to automatically maintain a constant voltage level. A voltage regulator can be a simple "feed forward" design, or it can incorporate negative feedback control loops. They can use an electromechanical mechanism or electronic components. This series of fixed voltage integrated voltage regulators is designed for a wide variety of applications. Such applications include on-card regulation to eliminate the noise and distribution problems associated with single-point regulation. Each of these regulators can deliver up to 1.5A of output current.



Figure 3.2 –Voltage Regulator

REGULATOR

The Figure 3.3 depicted below is the front view of the voltage regulator with its pin terminals labelled. The internal current limit and thermal shutdown feature of these regulators make them essentially immune to overload. In addition to being used as a fixed voltage regulator, these devices can also be used with external components to obtain adjustable output voltage and current, and can also be used as a power pass element. With precision controllers. LM78XX series three-terminal positive regulators are available in TO220 packages and with a variety of fixed output voltages, making them useful for a variety of applications. Each type features internal current limiting, thermal shutdown, and safe operating area protection, making them essentially indestructible.

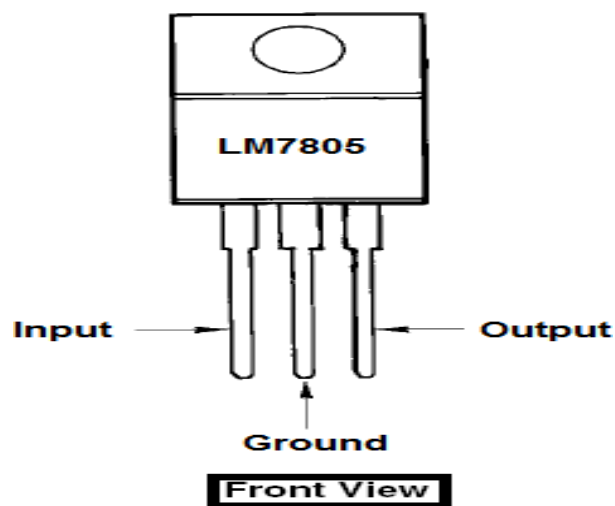


Figure 3.3 –The Front view of Voltage Regulator

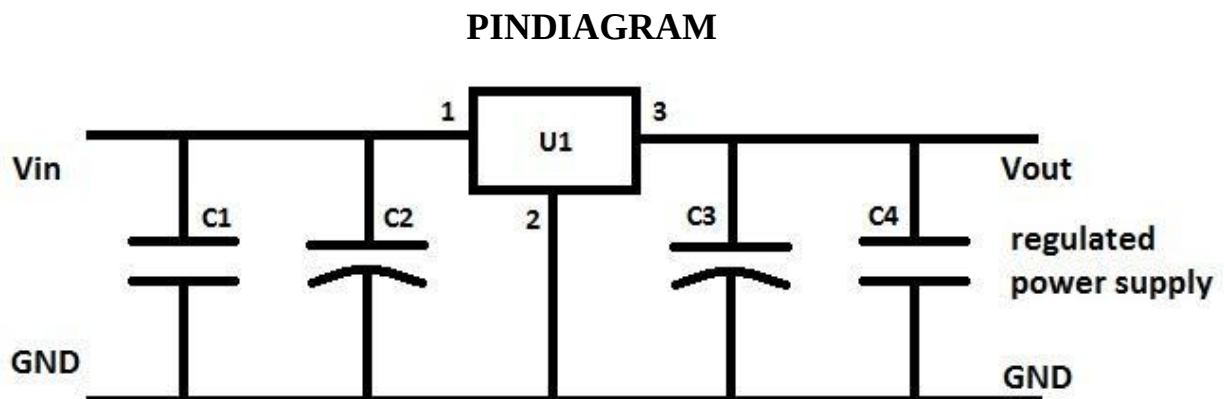


Figure 3.4 –Pin Diagram circuit Connection of the Voltage Regulator

The Figure 3.4 shown above shows the pin diagram circuit connection of the voltage regulator. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

FEATURES

1. Output Current up to 1A
2. Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V
3. Thermal Overload Protection
4. Short Circuit Protection
5. Output Transistor Safe Operating Area Protection

RESET BUTTON

DESCRIPTION

The first circuit pulls the RESET pin low to alter the chip. The second circuit is that the same, however with a push button. If you press that, the chip can get reset. Once the 5V power is switched on, the condenser shorts to 5V, and then step by step the RC circuit discharges to bring the reset pin to zero.

The Figure 3.5 shown below shows the circuit diagram for the reset button interfaced with the controller. A power-on reset (POR) generator could be a microcontroller or chip peripheral that generates a reset signal once power is applied to the device. It ensures that the device starts operative in a much identified state.

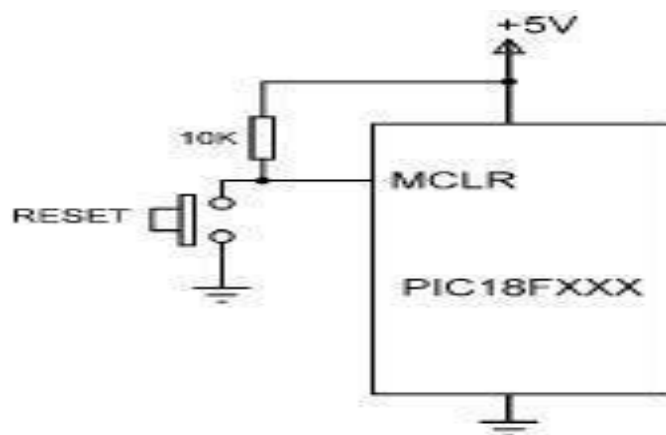


Figure 3.5 – Circuit Diagram for Reset Button Interfaced with Controller

CIRCUIT DIAGRAM FOR RESET BUTTON CONNECTS WITH CONTROLLER:

A power-on reset (POR) is a circuit that provides a predictable, regulated voltage to a microprocessor or microcontroller with the initial application of power. A POR system can be a peripheral, but in sophisticated processors or controllers the POR is integrated on the main chip.

UART COMMUNICATION PORT

DESCRIPTION

A universal asynchronous receiver/transmitter (UART) is a block of circuitry responsible for implementing serial communication. Essentially, the UART acts as an intermediary between parallel and serial interfaces.

A universal asynchronous receiver/transmitter (UART), is a computer hardware device for asynchronous serial communication in which the data format and transmission speeds are configurable. UARTs are commonly used in conjunction with communication standards such as TIA (formerly EIA) RS-232, RS-422 or RS-485.

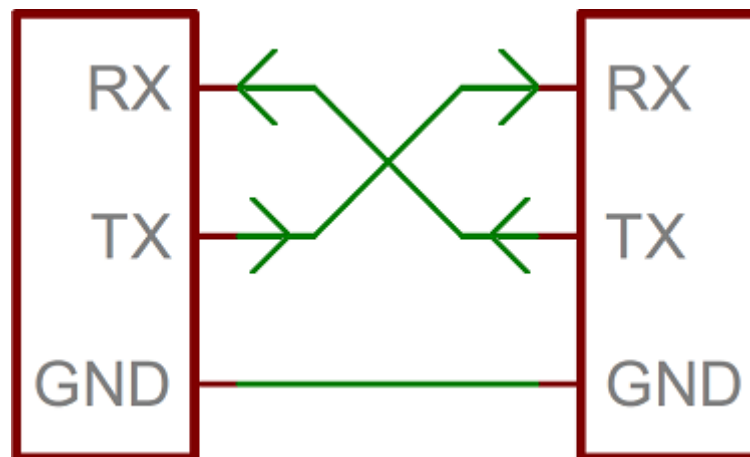


Figure 3.6 – UART Communication

UART COMMUNICATION

The UART is explained in the above fig 3.6, shows the communications between two devices that's going to transmit data receives the data from a data machine. The data machine is used

to shoot data to the UART by another device like a CPU, memory, or microcontroller. Data is transferred from the data machine to the transmitting UART in resembling form. After the transmitting UART gets the resembling data from the data machine, it adds a launch bit, a equality bit, and a stop bit, creating the data packet. Next, the data packet is affair serially, bit by bit at the TX leg. The entering UART reads the data packet bit by bit at its Rx leg. The entering UART also converts the data back into resembling form and removes the launch bit, equality bit, and stop bits. Eventually, the entering UART transfers the data packet in resembling to the data machine on the entering end.

Launch BIT

The UART data transmission line is typically held at a high voltage position when it's not transmitting data. To start the transfer of data, the transmitting UART pulls the transmission line from high to low for one timepiece cycle. When the entering UART detects the high to low voltage transition, it begins reading the bits in the data frame at the frequency of the baud rate.

DATA FRAME

The data frame contains the factual data being transferred. It can be 5 bits up to 8 bits long if an equality bit is used. However, the data frame can be 9 bits long, if no equality bit is used. In utmost cases, the data is transferred with the least significant bit first.

Equality

Equality describes the evenness or oddness of a number. The equality bit is a way for the entering UART to tell if any data has changed during transmission. Bits can be changed by electromagnetic radiation, mismatched baud rates, or long distance data transfers. After the entering UART reads the data frame, it counts the number of bits with a value of 1 and checks if the aggregate is an indeed or odd number. However, the 1 bits in the data frame should total to an indeed number, If the equality bit is a 0 (indeed equality). Still, the 1 bit in the data frame should total to an odd number, If the equality bit is a 1 (odd equality). When the equality bit matches the data, the UART knows that the transmission was free of crimes.

But if the equality bit is a 0, and the aggregate is odd; or the equality bit is a 1, and the aggregate is indeed, the UART knows that bits in the data frame have changed.

STOP BITS

To gesture the end of the data packet, the transferring UART drives the data transmission line from a low voltage to a high voltage for at least two bit durations.

ADVANTAGES

1. Only uses two wires
2. No clock signal is necessary
3. Has a parity bit to allow for error checking
4. The structure of the data packet can be changed as long as both sides are set up for it
5. Well documented and widely used method

DISADVANTAGES

1. The size of the data frame is limited to a maximum of 9 bits
2. Doesn't support multiple slave or multiple master systems
3. The baud rates of each UART must be within 10% of each other
4. Continue on to part three of this series, Basics of the I2C Communication Protocol to learn about another way electronic devices communicate. Or if you haven't already, check out part one, Basics of the SPI Communication Protocol.

ULTRASONIC SENSOR

DESCRIPTION

An Ultrasonic detector is a device that can measure the distance to an object by using sound swells. It measures distance by transferring out a sound surge at a specific frequency and harkening for that sound surge to bounce back. By recording the time between the sound surge being generated and the sound surge bouncing back, it's possible to calculate the

distance between the sonar detector and the object. **ULTRASONIC SENSOR** Ultrasonic detectors emit ultrasonic beats, and by measuring the time of the ultrasonic palpitation reaches the object and back to the transducer. The sonic swells emitted by the transducer are reflected by an object and entered back in the transducer. After having emitted the sound swells, the ultrasonic detector will switch to admit mode. The time ceased between emitting and entering is commensurable to the distance of the object from the detector.



Figure 3.7 – An Ultrasonic Sensor

ULTRASONIC SENSOR

The Figure 3.7 shown above is the image of an Ultrasonic Sensor. Ultrasonic detectors emit ultrasonic beats, and by measuring the time of the ultrasonic palpitation reaches the object and back to the transducer. The sonic swells emitted by the transducer are reflected by an object and entered back in the transducer. After having emitted the sound swells, the ultrasonic detector will switch to admit mode. The time ceased between emitting and entering is commensurable to the distance of the object from the detector.

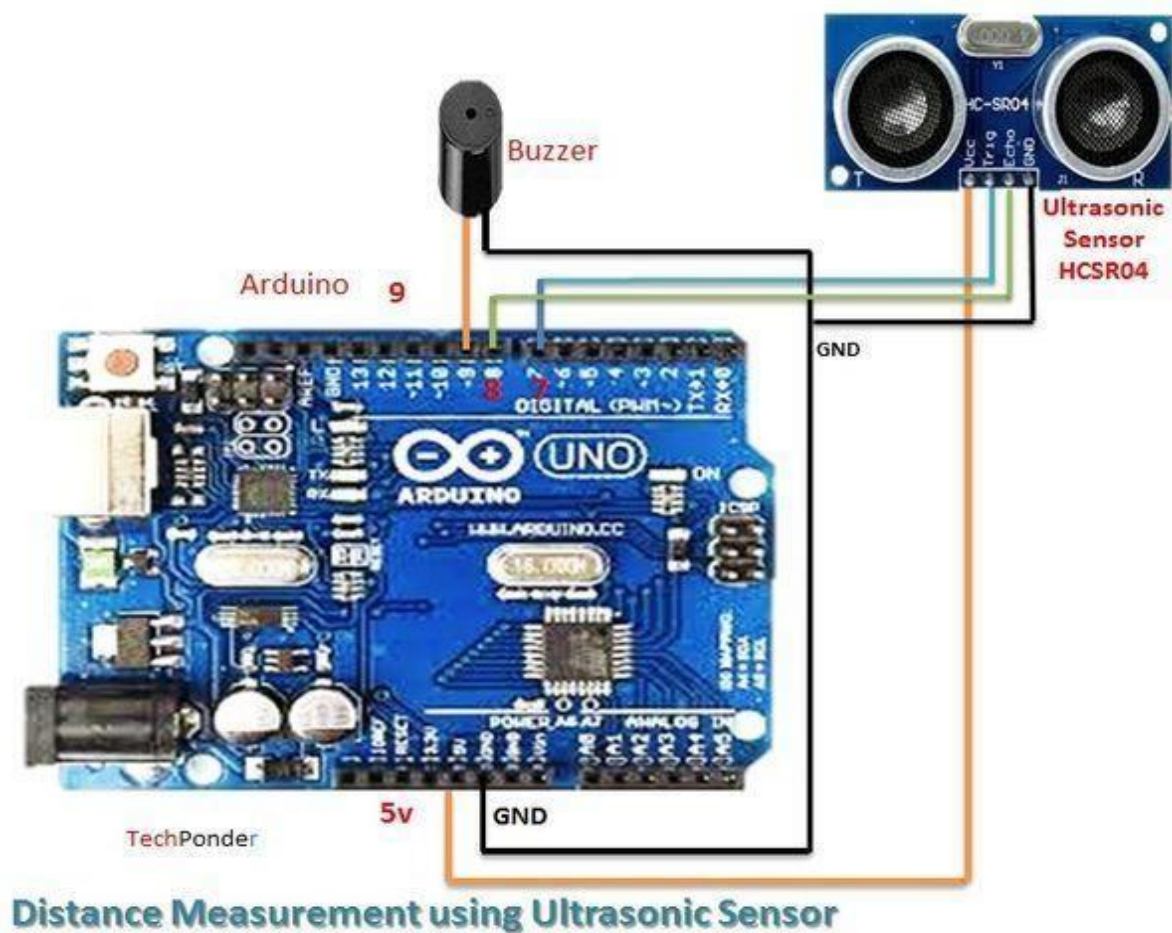


Figure 3.8 – Diagram which shows the Ultrasonic Sensor interfaced with Arduino UNO

ULTRASONIC SENSOR INTERFACE WITH ARDUINO

The Figure 3.8 shown above is the diagram which illustrates how the Ultrasonic sensor is interfaced with the Arduino UNO. Ultrasonic transmitter emitted an ultrasonic surge in one direction and started timing when it launched. Ultrasonic spread in the air and would return incontinently when it encountered obstacles on the way. At last the ultrasonic receiver would stop timing when it receives the reflected surge. The distance of detector from the target object is calculated. It offers excellent non-contact range discovery with high delicacy and stable readings in an easy-to- use package. It operation isn't affected by sun or black material. The force voltage to the detector is 5VDC. The detector has two legs vicelike trig and echo which is connected to the regulator to give digital input.

FEATURES

1. Working Voltage: 5VDC
2. Quiescent Current : 2Ma
3. Working Current: 15mA
4. Detecting Range: 2cm - 4.5m
5. Trigger Input Pulse width: 10uS

APPLICATIONS

1. Robot navigation
2. Obstacle avoidance
3. Engineering measurement tools
4. Industrial control system

BATTERY (12 V)

DESCRIPTION

Batteries are a set of 1 or more cells whose chemical reactions create a flow of electrons during a circuit. All batteries are made from three basic components: an anode (the ‘-’ side), a cathode (the ‘+’ side), and a few quite electrolytes (a substance that chemically reacts with the anode and cathode).

When the anode and cathode of a battery is connected to a circuit, a reaction takes place between the anode and therefore the electrolyte. This reaction causes electrons to flow through the circuit and back to the cathode where another reaction takes place. When the fabric within the cathode or anode is consumed or not ready to be utilized in the reaction, the battery is unable to supply electricity. At that point, your battery is “dead.”

Batteries that have got to be thrown away after use are referred to as primary batteries. Batteries that can be recharged are called secondary batteries.

BATTERY (12V)

12-volt battery, in its most common form was introduced for the early transistor radios. It has an oblong prism shape with rounded edges and a polarized snap connector at the highest. This

type is usually utilized in walkie talkies, clocks and smoke detectors. They are also used as backup power to stay the time in certain electronic clocks.

This format is usually available in primary carbon-zinc and alkaline chemistry, in primary lithium sulfide, and in rechargeable form in nickel cadmium, nickel-metal hydride and lithium-ion. Mercury oxide batteries during this form haven't been manufactured in a few years thanks to their mercury content.

12V battery features a rectangular prism shape with rounded edges and a polarized snap connector at the highest. A zinc-carbon (6F22) battery is a dry cell battery that delivers a potential of 1.5 volts between a zinc metal electrode and a carbon rod from an electrochemical reaction between zinc and manganese dioxide mediated by an appropriate electrolyte.

It was introduced for the early transistor radios. It is usually conveniently packaged during a zinc can which also is the anode with a negative potential, while the inert carbon rod is that the positive cathode. An advantage is that several nine-volt batteries are often connected to every other serial to supply higher voltages.

FEATURES

1. Output voltage: 12v
2. Current capacity: 2.5Ah
3. Approximate Volume: 0.2 cu. in. (3.3 cu. cm.)
4. Approximate Weight: 0.4 oz. (11 gm.)

APPLICATIONS

1. Walkie talkies.
2. It is used to assorted electronics projects.
3. Use a 12V battery clip to easily connect your 9V battery to your Arduino.
4. The "12V clip" is also used on some batter holders of assorted voltages.

LCD

DISPLAY

DESCRIPTION

N

The Figure 3.9 shown below is the image of a 16x2 LCD display. LCD (liquid crystal display) is that the technology used for displays in notebook and other smaller computers. Like LED (LED) and gas-plasma technologies, LCDs allow displays to be much thinner than beam tube (CRT) technology.

Flat screen LCD and plasma screens add a totally different way. In a plasma screen, each pixel may be a tiny lamp switched on or off electronically. In an LCD television, the pixels are switched on or off electronically using liquid crystals to rotate polarized light



Figure 3.9 –16x2 LCD Display

16X2 LCD DISPLAY

The Figure 3.10 shown below is the image which shows the data which has been programmed to be displayed on the LCD display. TV stands for liquid demitasse display. They come in numerous sizes 8x1, 8x2, 10x2, 16x1, 16x2, 16x4, 20x2, 20x4, x2, 30x2, 32x2, 40x2 etc. Numerous transnational companies like, Philips, Hitachi Panasonic make their own

special kind of TV'S to be used in their products. All the TV'S perform the same functions (display characters figures, special ASCII characters etc.). Their programming is also the same

and they all have the same 14 legs (0-13) or 16 legs (0 to 15). Alphanumeric displays are used in a wide range of operations, including palmtop computers, word processors, photocopiers, point of trade outstations, medical instruments, cellular phones, etc.



Figure 3.10 –The Data which have programmed shown on LCD display

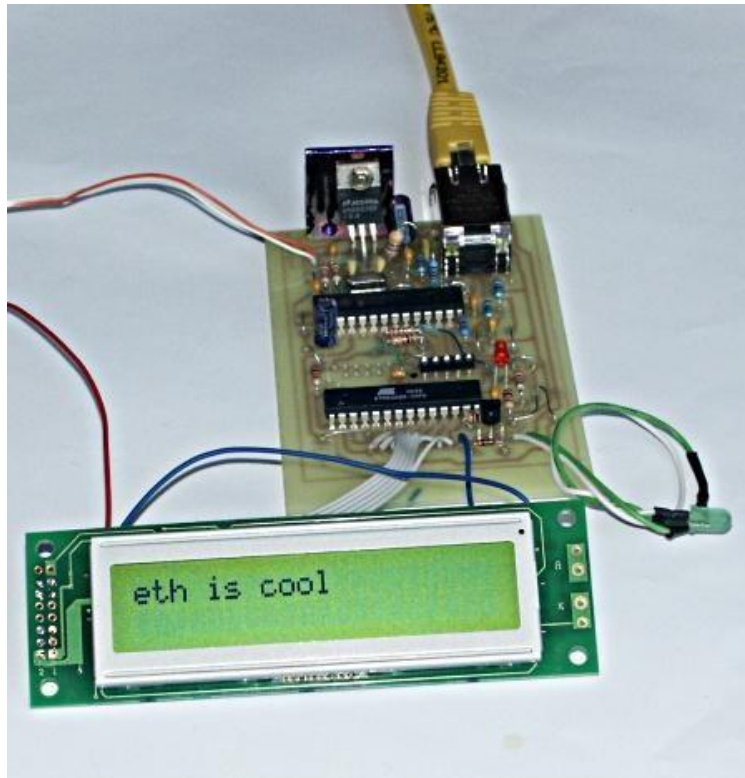


Figure 3.11 –The LCD display interfaced with Microcontroller

LCD INTERFACE WITH MICROCONTROLLER

The Figure 3.11 shown above shows the image of how an LCD display is interfaced with Microcontroller. This is a TV Display designed for E-blocks. It's a 16 character, 2- line alphanumeric TV display connected to a single 9- way D- type connector. This allows the device to be connected to utmost E-Block I/ O anchorages. The TV display requires data in a periodical format, which is detailed in the stoner companion below. The display also requires a 24V power force. Please take care not to exceed 5V, as this will beget damage to the device. The 24V is stylish generated from the E-blocks Multi programmer or a 24V fixed regulated power force.

The 24 x 8 inch intelligent alphanumeric fleck matrix displays is able of displaying 224 different characters and symbols. A full list of the characters and symbols is published on runners 7/8 (note these symbols can vary between brands of TV used). This folder provides all the specialized specifications for connecting the unit, which requires a single power force (24V).

FEATURES

1. Input voltage: 24v
2. E-blocks compatible
3. Low cost
4. Compatible with most I/O ports in the E-Block range
5. Ease to develop programming code using Flow code icons

APPLICATIONS

1. Monitoring

LCD INTERFACE BOARD

DESCRIPTION

The Figure 3.12 shown below shows an image of the LCD interface Board. LCD board is specially designed for interfacing with Arduino. This board consists of two sections namely data and control sections. This board is provided with a potentiometer to adjust the LCD. The supply voltage to the board is given from the controller or from a separate source.

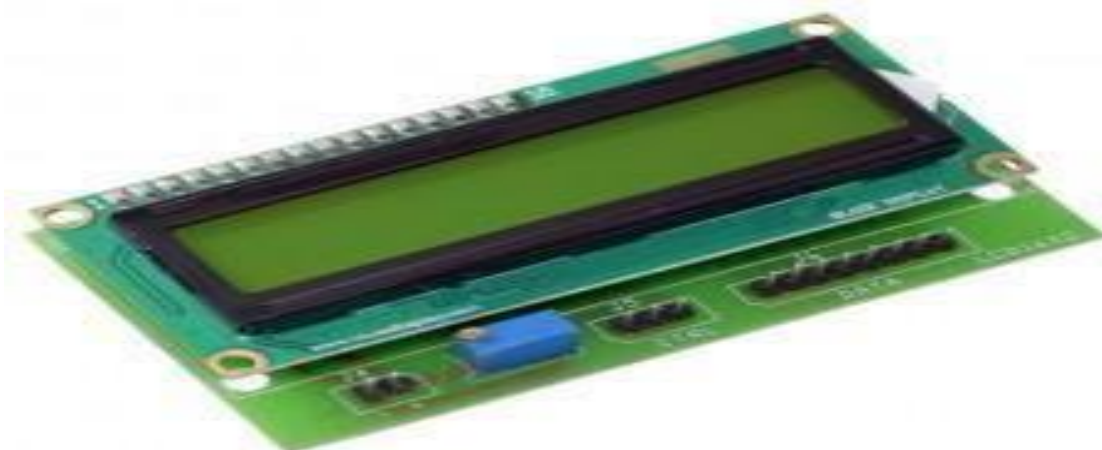


Figure 3.12 –LCD interface Board

LCD INTERFACE BOARD

The communication extension board provides a set of communication features and pin outs as well as an external power connector. The LCD-Board is ideal as an extension board for the Hitex LPC2478-Stick or the Hitex LPC3250- Stick. LCD module [STM32F4DIS-LCD] - consists of 3.5 inch LCD and driver board. This module is designed for Embest STM32F4DIS-BB board.

FEATURES

1. Supply voltage: 5VDC
2. Separate data lines
3. Separate control lines

APPLICATIONS

1. Display applications for Arduino and other controller

DUAL CHANNEL RELAY

DESCRIPTION

A relay is an electrically operated switch. Numerous relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, similar as solid-state relays. Relays are used where it's necessary to control a circuit by a separate low- power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers; they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used considerably in telephone exchanges and early computers to perform logical operations.

Relays are simple switches which are operated both electrically and mechanically. Relays correspond to an electromagnet and also a set of connections. The switching medium is carried out with the help of the electromagnet. The main operation of a relay comes in places where only a low- power signal can be used to control a circuit. It's also used in places where only one signal can be used to control a lot of circuits.



Figure 3.13 –The Dual Channel Relay

DUAL CHANNEL RELAY BOARD

The Figure 3.13 shown above is a Dual Channel Relay. They were used to switch the signal coming from one source to another destination. The high end operations of relays bear high power to be driven by electric motors and so on. Similar relays are called contactors.

A relay is an electromechanical switch which is actuated by an electric current. A two relay board arrangement contains a motorist circuit, power force circuit and insulation circuit. A relay is assembled with that circuit. The motorist circuit contains transistors for switching operations. The transistor is used for switching the relay.

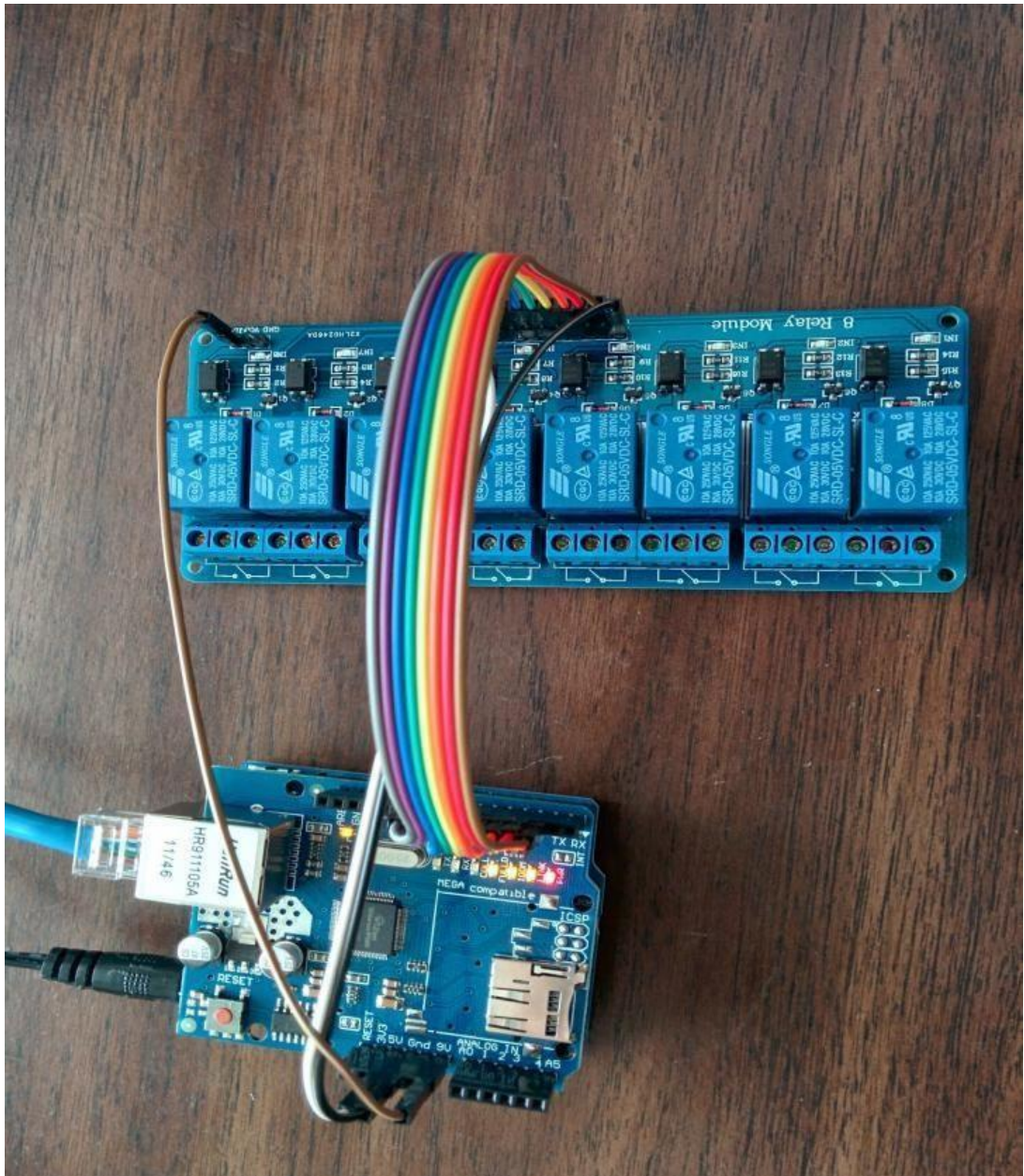


Figure 3.14 –A Relay Board is interfaced with an Arduino UNO

RELAY BOARD INTERFACE WITH CONTROLLER

The Figure 3.14 shown above is how a Relay board is interfaced with a Controller. An isolation circuit prevents reverse voltage from the relay which protects the controller and transistor from damage. The input pulse for switching the transistor is given from the microcontroller unit. It is used for switching of a two device.

FEATURES

1. Input voltage: 12VDC
2. Driver unit: ULN2003A
3. Isolation unit: In4007
4. Fast switching
5. Motor forward and reverse operation

APPLICATIONS

1. Ac load Switching applications
2. Dc load Switching applications
3. Motor switching applications

TRANSFORMER

Step-down transformer which connects 220v AC to 12v AC. This transformer used for projects, chanting, and other sources which needs 12 v supply. The transformer has a primary and secondary. The primary side is given input as 220v and secondary side output 12v AC. The Figure 3.15 shown below is a Step down Transformer which is used to step down 230 V AC to 12 V AC.



Figure 3.15 –The Step down Transformer

CONVERTER

1. IT IS Full Wave Rectifier
2. Power Diodes can be connected together to form a full wave rectifier that convert AC voltage into pulsating DC voltage for use in power supplies.
3. In a Full Wave Rectifier circuit two diodes are now used, one for each half of the cycle. A multiple winding transformer is used whose secondary winding is split equally into two halves with a common center tapped
4. The Figure 3.16 shown below is a Full Bridge Rectifier/ Converter. It is used to rectify the AC supply input and provide DC as the Output.

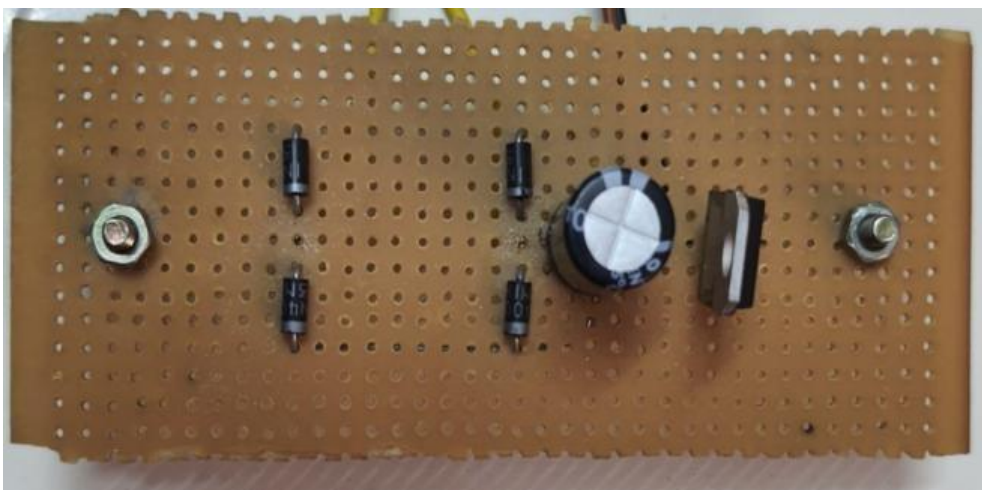
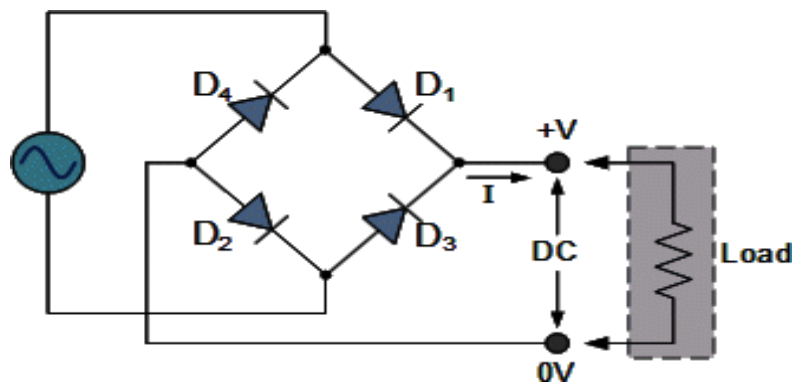


Figure 3.16 –The Full wave Rectifier/ Converter Circuit

INVERTER CIRCUIT

An inverter circuit is used to convert the DC power to AC power. Inverter Circuit are very much helpful to produce high voltage using low voltage DC supply or Battery. ... The 12V DC to 220V AC inverter circuit is designed using IC CD4047. The IC CD4047 acts as a switching pulse oscillating device. The n-channel power MOSFET IRFZ44n acts as a switch. The 12-0-12V secondary transformer inversely used as a Step-up transformer from converting low AC to High AC. The Figure 3.17 shown below shows the Inverter circuit component which takes the Input as DC and produces AC output.

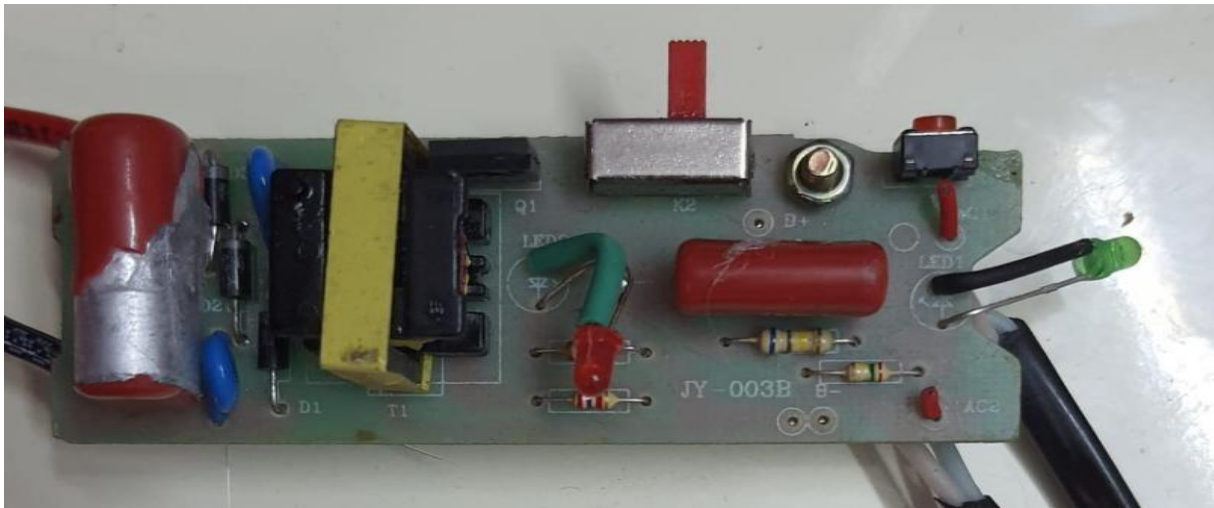


Figure 3.17 –The Inverter Circuit component

POTENTIOMETER

A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as variable resistor or rheostat. The Figure 3.18 shown below is the image of a potentiometer which is used to vary the voltage incase required.



Figure 3.18 –The Potentiometer

OVERVIEW OF HARDWARE COMPONENTS

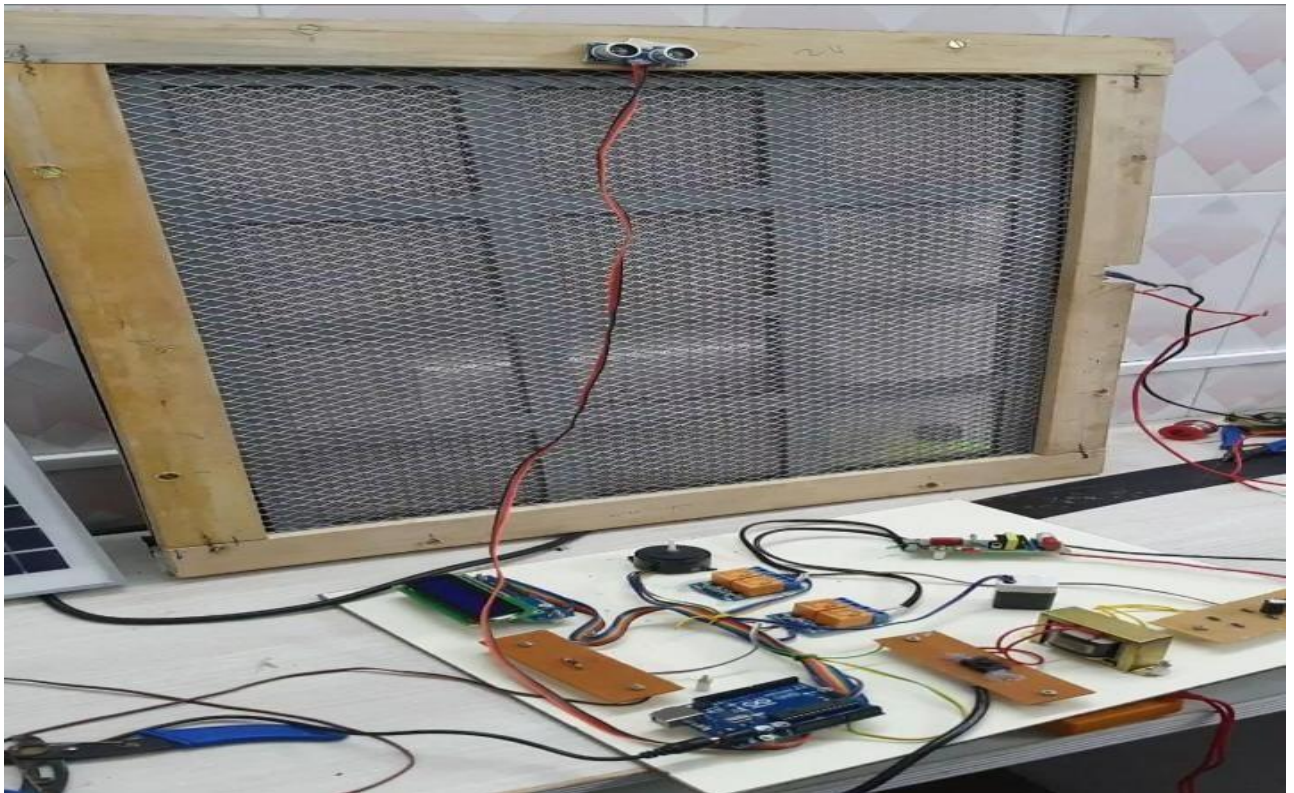


Figure 3.19 – The total Overview of Hardware Components of our proposed system

The Figure 3.19 shown above shows the total Overview of the Hardware Components of our proposed system. IN which the total components are connected with circuit diagram as stated in chapter 3.

CHAPTER 4

OBSERVATION RESULTS

OBSERVATIONS OVER PROPOSED SYSTEM

The below observation has taken from the testing of Mosquito Bat with Direct AC power supply and rating of components used. The Figure 4.1 shown below shows the image of the testing of the Mosquito Window when supply is given.



Figure 4.1 – The Testing of Mosquito Window with Supply Present

TESTING OF WINDOW



Figure 4.2 – The Reading of the Voltage value from Digital Multimeter

The Figure 4.2 shown above shows the Reading of the voltage value from the Digital Multimeter.

OUTPUT VALUE OF DIGITAL MULTIMETER

TRANSFORMER RATINGS

CURRENT -- 1 AMPS

PRIM ARY WINDING (INPUT) - 220 V 1230 V SECOUNDARY WINDING (OUTPUT)- 12V AC / 1 AMPS

COVERTER

" FULL WAVE B RIDGE CONVERTER" DIODES: (IN4001) - 4 no I

Current - 1 AMPS CAPACITOR - 1000 pF/ 25V

REGULATOR - 7812

BATTERY (LEAD ACID)

OUTPUT - 4V1 1.5 AMPS

Mesh Output

Voltage: 17.71 V to 19.72 V Current: 3 AMPS

CHAPTER 5

FUTURE SCOPE AND CONCLUSION

FUTURE SCOPE

1. It can be added IR sensors all around the front border of the window frame so that the sensors can cover the total view from every direction / angle.
2. We can add other smart features to lure insects/mosquitoes to the window using UV lights and sound frequencies.
3. We can use better quality material to make sure it is completely water proof by using upvc for the window frame which is a good water proofing material.

CONCLUSION

This paper designs and realizes a kind of voltage and current control system by a step-down transformer which is operated by AT mega 328p MCU. The LCD display can display the ultrasonic distance. This system's main features are to produce similar type of mosquito killing device for the window by reducing the high voltage allowing about the well-being and safety of the people. It's lesser, cheaper and faster device rather than available mosquito killing mesh device. It's comparatively economical and easy to use and at the same time reliable and of low- cost. Mosquito traps involving the explained features may actually help to attract large proportions of mosquitoes towards it, and thus these units must noway be positioned inside the house or close to living beings, rather more or less outside similar as in the arena, lawns, passages, corridors, galleries etc. As described, this device can be used as a mosquito ejector.

Our Project modifies the concept of the mosquito RACKET into reality more innovative which eliminates mosquitoes/ insects before entering the premises. It can be attached in Homes and also in places such as industries of sugar related products or restaurants where insects/ mosquitoes can be a pest and thereby avoid various sicknesses and diseases. This can also be brought out as a Product with more advancement in technologies which ensures full safety to living beings.

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