Design & Implementation of Microcontroller Based Anti-Thief Device System



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Declaration

It is declared hereby that this project paper or any part of it has not been submitted to anywhere else for the award of any degree.

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Certification

This is to certify that this project entitled "**Design & Implementation of Microcontroller Based Anti-Thief Device System**" is done by the following students under my direct supervision. This project work has been carried out by them in the laboratories of the Department of Electrical and Electronic Engineering under the Faculty of Engineering, Sonargaon University (SU) in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering.

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ABSTRACT

In today time in our country something stolen or, something valuable taken away by someone has become a normal occurrence, sometimes it is heard that someone has stolen a car parked on the side of road. It's a common problem we heard that a car is stolen from a car parking area or a garage. I think it is due to the weak security system in the car parking area or a big mistake the person who is responsible for those work, but after all, when something is losses, it is not so easy to get back.

So keeping all these things in mind, we think that Anti-thief device is a very useful idea to keep a very valuable car safe, whether it is one's own or another person or more than one person or an organization. Anti-Thief device is usually used as a thief detection technique so that, we at least know a theft is about to happen before we lose our valuable car. Basically' if this device is installed on a door and someone tries to open the door a phone call will immediately go to your phone. It can be any door. It can be door of a car, a parking area gate or a garage door, where many cars are kept together.

I think the device will basically play an important role in providing a better security. At the end of the day none of us want to lose anything that is precious to us, no matter how precious it is and if it is something like a car then it is very important to us so that Anti-Thief device can be a good option.

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LIST OF ABBREVIATIONS

DC	Direct Current
AC	Alternating Current.
LCD	Liquid Crystal Display
ADC	Analog-to-Digital Converter
IC	Integrated Circuit
LED	Light Emitting Diode
PCB	Printed Circuit Board
GSM	Global System for Mobile Network

CHAPTER I

INTRODUCTION

1.1 Introduction

In today time in our country something stolen or something valuable taken away by someone has become a normal occurrence, sometimes it is heard that someone stolen a car parked on the side of road. It's a common problem we heard that a car is stolen from a car parking area or a garage. I think it is due to the weak security system in the car parking area or a big mistake the person who is responsible for those work, but after all, when something is losses, it is not so easy to get back.

So keeping all these things in mind, we think that Anti-thief device is a very useful idea to keep a very valuable car safe, whether it is one's own or another person or more than one person or an organization. Anti-Thief device is usually used as a thief detection technique so that, we at least know a theft is about to happen before we lose our valuable car. Basically' if this device is installed on a door and someone tries to open the door a phone call will immediately go to your phone.

It can be any door. It can be door of a car, a parking area gate or a garage door, where many cars are kept together. I think the device will basically play an important role in providing a better security. At the end of the day none of us want to lose anything that is precious to us, no matter how precious it is and if it is something like a car then it is very important to us so that Anti-Thief device can be a good option.

1.2 Background Study

As car theft has become a common occurrence it is definitely a concern. The numbers of the thief gang are taking the cars in the blank of an eye by breaking the lock of the car parked on the side of the road and parking area with the passenger, sometimes with the master key (Special Key) 20-25 cars are stolen every month from the capital city of our country, Source of The Daily Jugantor, 21 January, 2019. It's very alarming also it's not stable for this number. It's increased day by day also increased the another big cites or rural area of all over the country. In some cases, our carelessness is more responsible here. If we are more aware, it is impossible to reduce such incident's, also if we want we can use the Anti-Thief device to keep our cars safe.

1.3 Objectives

The main objective of this system is to introduce an automated security-system with microcontroller technology. The supplementary objectives of this project are as follows :

An Anti-thief device integrates mobile network system. By which we get alert very easily and the matter is very simple. It our precious car is stolen before I get to know through direct phone call That, my car is being stolen and I take measures to prevent it even above all protect my car from if you can, it's a real pleasure. If desired the Anti-Thief device can be reading available at low cost and generally commercially viable we think this device will play an important role in catching thieves.

1.4 Project Organization

In this report, Chapter one covers introduction, background, objectives. Chapter two represents theory, description of the microcontroller, GSM-Module, Arduino Nano, Also other components. Chapter three describes and working principle of the project. In chapter four we have discussed result and discussion, cost estimation, future modification, conclusion.

CHAPTER II

THEORY OF THE PROJECT

2.1 Introduction

This chapter includes the total over view of the device. In this chapter we have followed-up the theory of Arduino Nano Microcontroller, Resistor, Capacitor, Transistor, GSM-Module, briefly describe of Microcontroller (ATMEGA 328P). Here we can know that the total system overview of the projects. We will also know that how the equipment is working with each other.

2.2 Theory

We've developed the system that can handle this critical situation perfectly. When our car parking areas garage are fully empty person, when we will try to see the activeness of our device. As we tried to open the door as a character of thief from the outside and try to get in, our limit switch did the right thing and from there it was gradually Arduino Nano and GSM-Module, GSM-Module sent a phone call very fast as a mobile phone call.

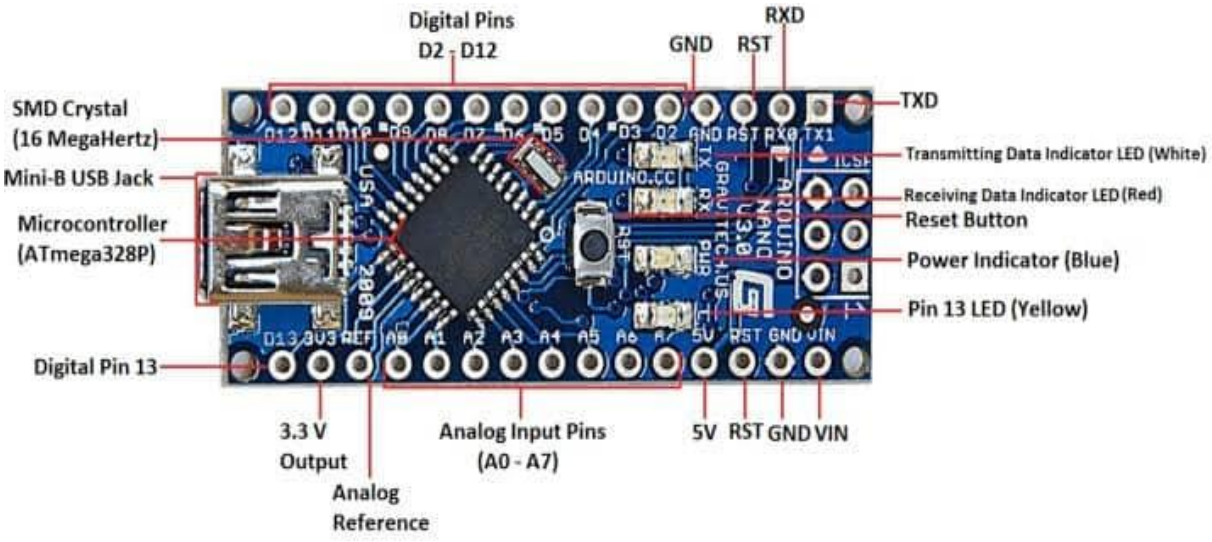


Fig : 2.2.1 Arduino Nano Pin Diagram

2.2.1 Technical specifications :

Table 2.1 : Technical Specifications of Arduino Nano

Microcontroller	ATmega328P
Operating Voltage	5V
Input Voltage Supply to Adopter	220-12V
Input Voltage for Circuit	5V
Digital Pins	(D_2 – D_{12})
Transmitting Data Indicator LED	White
Analog Input Pins	A_0 – A_7
Receiving Data Indicator LED	Red
SMD – Crystal	16 MHz
Mini USB Jack	Type – B
Clock Speed	16 MHz

2.2.2 Microcontroller ATMEGA328P

The Atmel® picoPower® ATmega328/P is a low-power CMOS 8-bit microcontroller based on the AVR® enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328/P achieves throughputs close to 1MIPS per MHz This empowers system designer to optimize the device for power consumption versus processing speed.
The Atmel AVR® core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in a single instruction executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers. The ATmega328/P provides the following features: 32Kbytes of In-System Programmable Flash with Read-While-Write capabilities, 1Kbytes EEPROM, 2Kbytes SRAM, 23 general purpose I/O lines, 32 general purpose working registers, Real Time Counter (RTC), three flexible Timer/Counters with compare modes and PWM, 1 serial programmable USARTs , 1 byte-oriented 2-wire Serial Interface (I2C), a 6- channel 10-bit ADC (8 channels in TQFP and QFN/MLF packages) , a programmable Watchdog Timer with internal Oscillator, an SPI serial port, and six software selectable power saving modes. The Idle mode stops the CPU while allowing the SRAM, Timer/Counters, SPI port, and interrupt system to continue functioning. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next interrupt or hardware reset. In Power-save mode, the asynchronous timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. The ADC Noise Reduction mode stops the CPU and all I/O modules except asynchronous timer and ADC to minimize switching noise during ADC conversions. In Standby mode, the crystal/resonator oscillator is running while the rest of the device is sleeping. This allows very fast start-up combined with low power consumption. In Extended Standby mode, both the main oscillator

and the asynchronous timer continue to run. Atmel offers the QTouch® library for embedding capacitive touch buttons, sliders and wheels functionality into AVR microcontrollers. The patented charge-transfer signal acquisition offers robust sensing and includes fully debounced reporting of touch keys and includes Adjacent Key Suppression® (AKS™) technology for unambiguous detection of key events. The easy-to-use QTouch Suite toolchain allows you to explore, develop and debug your own touch applications. The device is manufactured using Atmel's high density non-volatile memory technology. The On-chip ISP Flash allows the program memory to be reprogrammed In-System through an SPI serial interface, by a conventional nonvolatile memory programmer, or by an On-chip Boot program running on the AVR core. The Boot program can use any interface to download the application program in the Application Flash memory. Software in the Boot Flash section will continue to run while the Application Flash section is updated, providing true Read-While-Write operation. By combining an 8-bit RISC CPU with In-System Self-Programmable Flash on a monolithic chip, the Atmel ATmega328/P is a powerful microcontroller that provides a highly flexible and cost effective solution to many embedded control applications. The ATmega328/P is supported with a full suite of program and system development tools including: C Compilers, Macro Assemblers, Program Debugger/Simulators, In-Circuit Emulators, and Evaluation kits.

2.2.3 GSM system

Standard for Global System for Mobile Communication. GSM is an open and digital cellular technology used for mobile communication. It used four different frequency bands of 850 MHz, 900 MHz, 1800 MHz and 1900 MHz It uses the combination of FDMA and TDMA. This article includes all the concepts of GSM architecture and how it works.

GSM is having four different sites of cells are used in GSM :

I. Macro : In this size of cell, antenna is installed.
II. Micro : In this size of cell, antenna height is less than average roof level.
III. Pico : Small cells diameter of few meters.
IV. Umbrella : It Covers the shadowed (Fill the gaps between cells) regions.

Features of GSM :

I. Supports International roaming/roaming
II. Clear voice clarity
III. Ability to support multiple handheld device
IV. Spectral / Frequency efficiency.
V. Low powered handheld devices.
VI. Ease of accessing network.
VII. International ISDN Compatibility. GSM is nothing but a large system which is divided into further three subsystems.
VIII. BSS : Stands for Base Station Subsystem (BSS), handles traffic and signaling between a mobile phone and the network switching subsystem.

IX. NSS : Stands for Network and Switching subsystem (NSS), is the core network of GSM. That carried out call and mobility management functions for mobile present in network. NSS have different components like VLR, HLR, ELR.

X. OSS : Stands for Operating Subsystem (OSS), is a functional entity which the network operator monitors and control the system. OMC is the part of OSS. GSM – Module is very important part in our project for connecting the Arduino Microcontroller with the actual programs for sent a phone call as security alert.

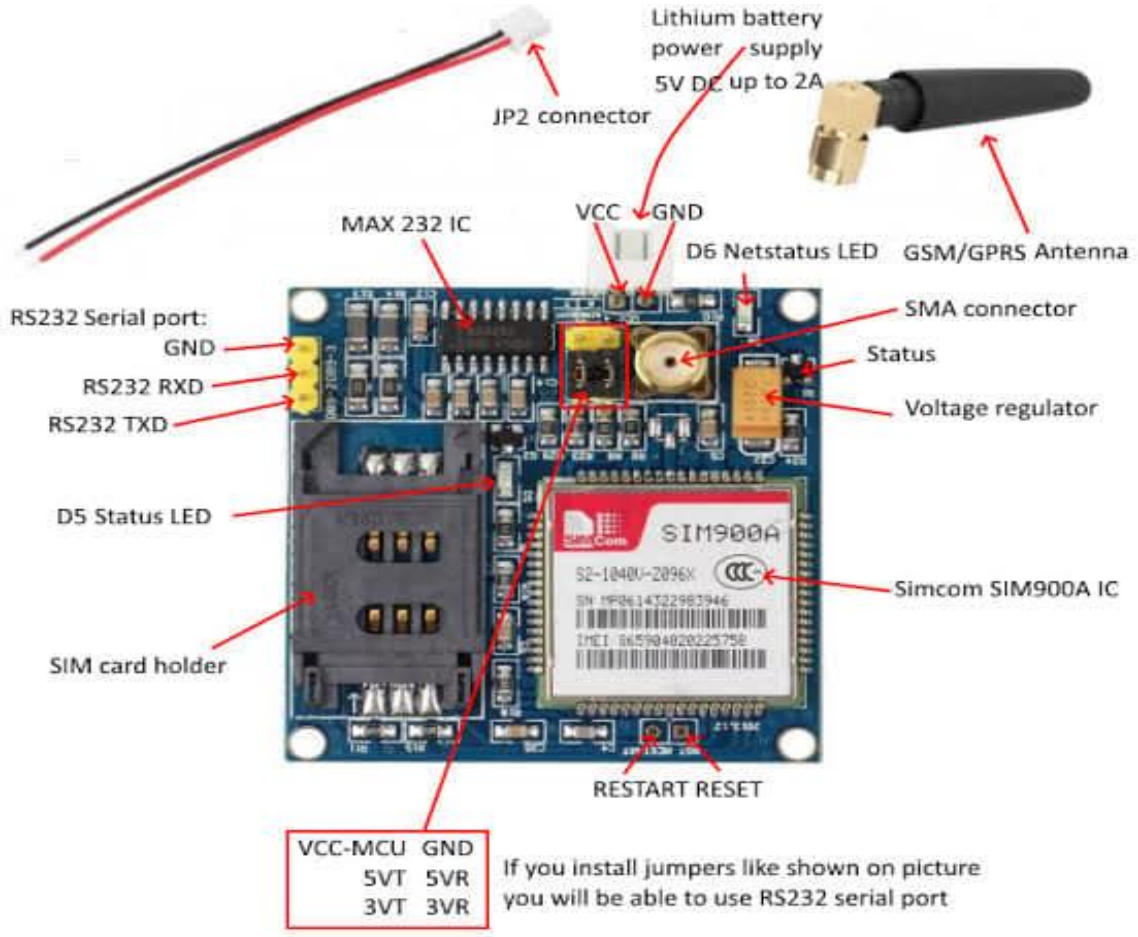


Figure : 2.2.3 : GSM – Module

2.2.4 Limit Switch

In Electrical Engineering, a limit switch is a switch operated by the motion of a machine part or the presence of an object. A limit switch can be used for controlling machinery as a part of a control system, as a safety interlock or as a counter enumerating object limit switches are used in a variety of applications and environments because of their raggedness, case of installation and reliability of operation they can determine the presence, passing, positioning and end of travel of an object. They were first used to define the limit of travel of an object hence the name "Limit Switch".

Standardized limit switches are industrial control components manufactured with a variety of operation of operator type, including lever, roller plunger and whisker. A reed switch may be used to indicate proximitly of a magnet mounted on some moving part proximitly switches operate by the disturbance of an electromagnetic field. Rarely a final operating device is directly controlled by the contracts an industrial limit switch, but more typically the limit switch, is wired through a control relay, a motor contractor control circuit or as an important input to a programable logic controller.

We used a low voltage consumption limit switch in our Anti-thief device system project. It is not a high-power operated limit switch, the power consumption rate of our project limit switch is (5V).

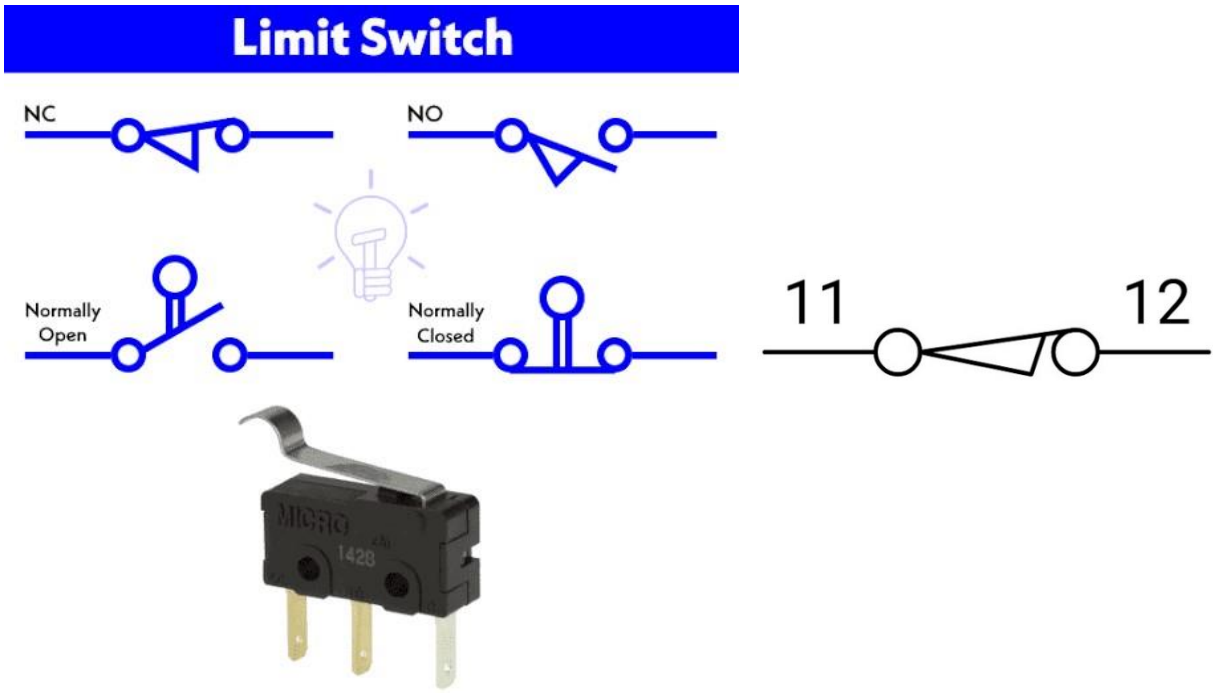


Figure : 2.2.4 : Limit Switching Operation

2.2.5 Buck Converter

The Buck Converter is used in SMPS circuits where the DC output voltage needs to be lower than the DC input voltage. The DC input can be derived from any DC supply. It is useful where electrical isolation is not needed between the AC source and the rectifier and the rectifier could be provided by a main isolating transformer. The switching transistor between the input and output of the Buck Converter continually switches on and off at high frequency to maintain a continuous output, the circuit uses the energy stored in the inductor, during the on periods of switching transistor to continue supplying the load during the off periods. The circuit operation depends on what is sometimes also called a flywheel circuit this is because the circuit acts rather like mechanical flywheel that, given regularly smoothly (Outputting Energy) at a steady rate.

2.2.6 AC or DC Input :

The Buck Converter is a form of AC – DC converter in our operational circuit, where we used a AC – DC Adaptor. AC – DC Adaptor converts the line voltage 220V to 12V. But 12V is not suitable our maximum circuit in our system. The maximum voltage consumption rate of our circuit is 5V. That's why we used a buck converter circuit to converted (12V to 5V) which voltage is perfect our system processing of conversion.

Line Voltage	220V AC
Adaptor Voltage	12V DC
Buck Converter Voltage	5V DC

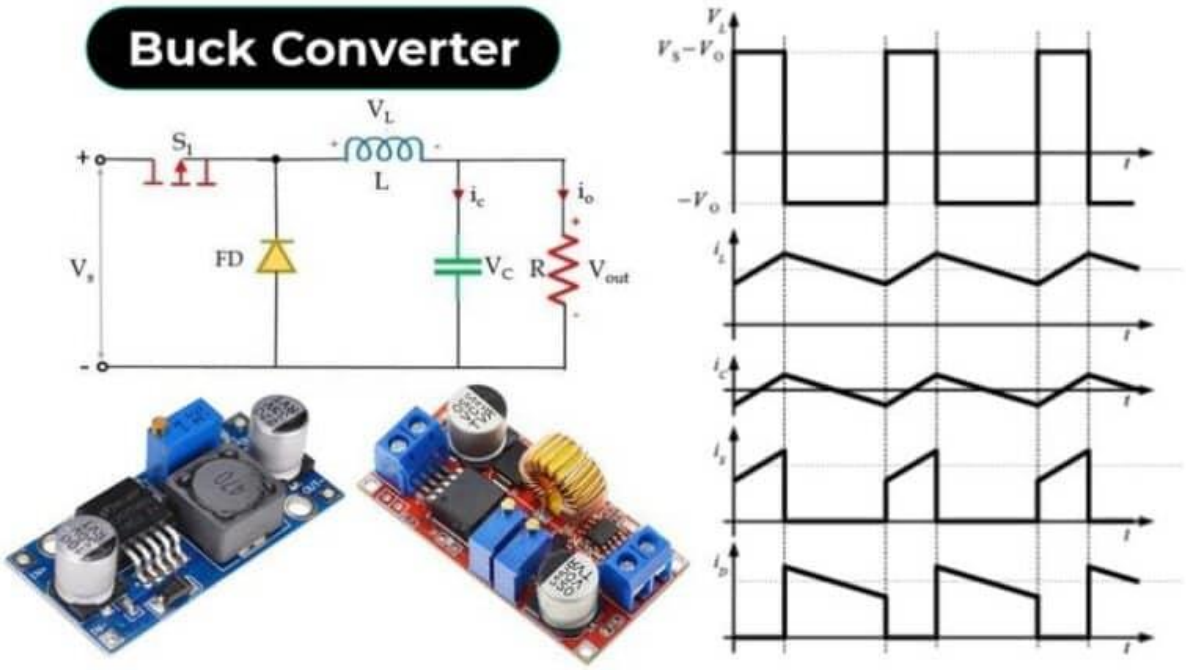


Fig : 2.2.5 : Buck Converter Circuit with Voltage Flow

CHAPTER III

DESIGN & FEBRICATION

3.1 Introduction

In this chapter fully cover with discuss design and fabrication of this project. Here we will discuss about developed block diagram and briefly describe about the circuit description and also learn about working principle. Total project flow chart is also available in this chapter.

3.2 Block Diagram

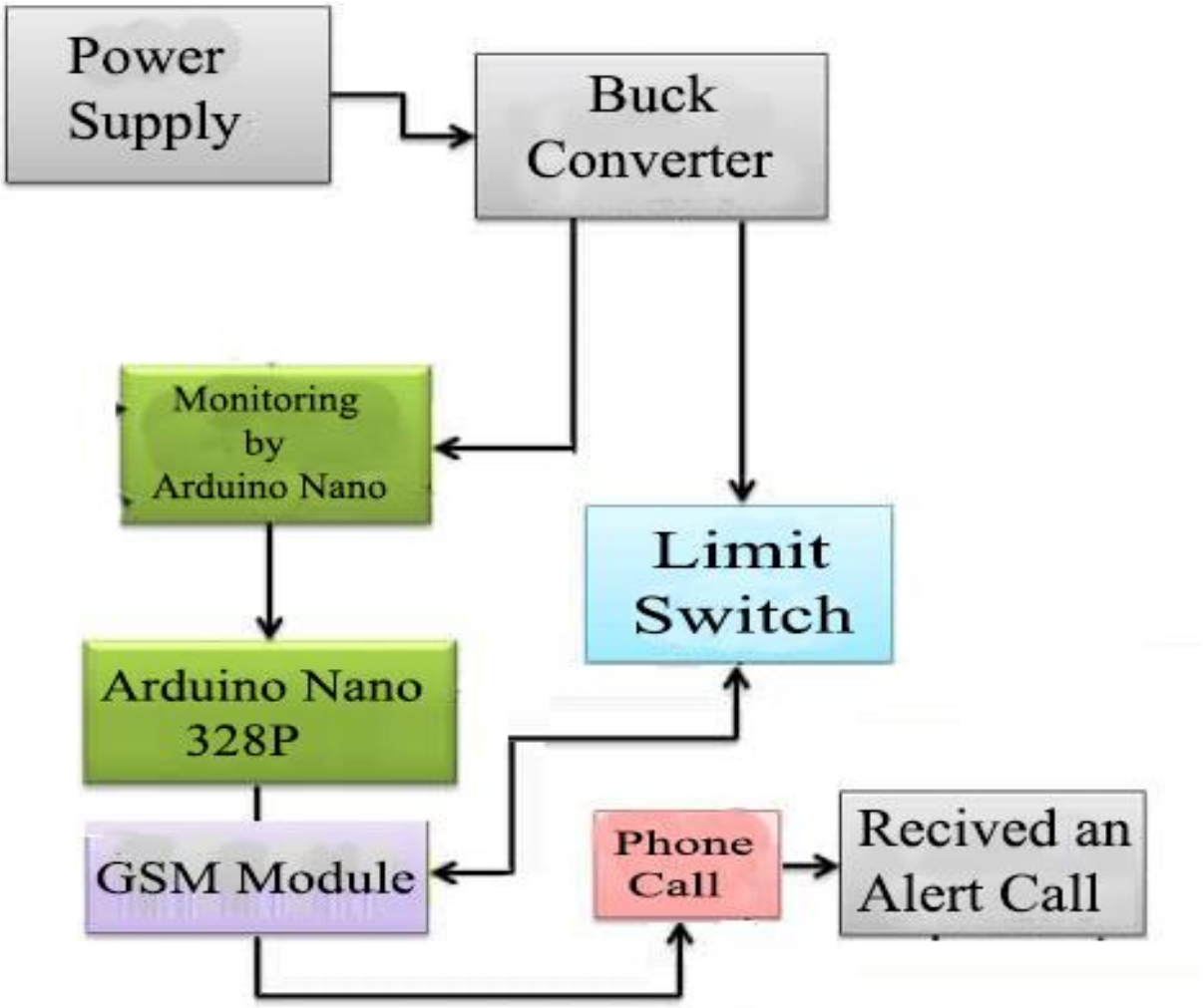


Figure : 3.2 : Block Diagram of Project

Here's the block diagram of our Microcontroller Based Integration of Anti-Thief Device System. We can clearly describe the working process through this block diagram. Firstly we have to provide the power from the supply voltage 220V than it regulated or step down by the voltage regulator or buck converter. Buck converter convert the voltage from 12V to 5V. When it converted from 12V to 5V. It is very suitable for circuit operation Arduino Nano ATMega-328P, GSM – Module also limit switch unit everything activated with perfectly. This circuit is ready for work power operation and management is very important issue for circuit or system operation. The actual power can be operated any system, but over voltage is very harmful it causes will be the damage our system.

3.3 Circuit Description

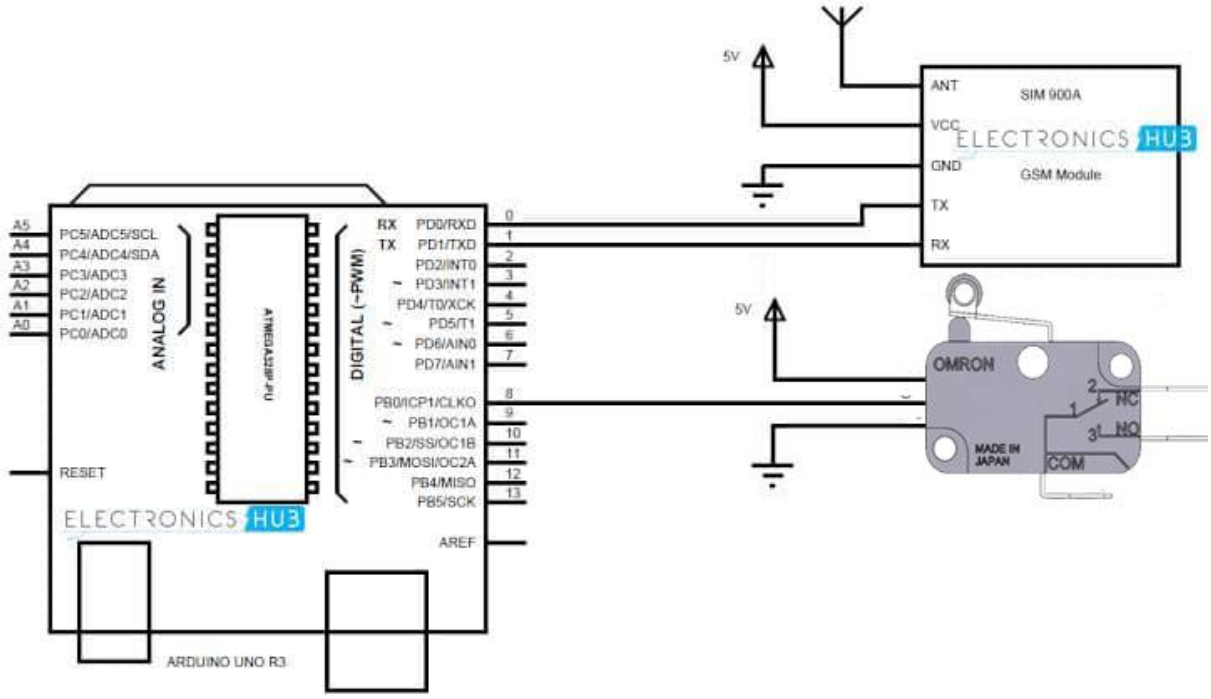


Fig : 3.3.3.1 : Circuit diagram of the Project

In our circuit we have used an Arduino Nano as the Microcontroller. The uses pin of Arduino Nano for GSM module is P D_0 / RXD- R_x, PD_1/TXD – TX are connected our GSM Module with the same errors of the pins of GSM Module TX, RX. Short meaning the power supporting across of the module is very low. The next processing of limit switch is connected with the nearest pin of Tx, Rx. It is PD2/INTO, PD3/INT1 when power unit will be activated for processing in our GSM Module. Firstly our supply voltage is affected our Arduino Microcontroller section, also drive the microcontroller into saturation mode and provides voltage suitable for GSM network detection when the proper network appears on the GSM

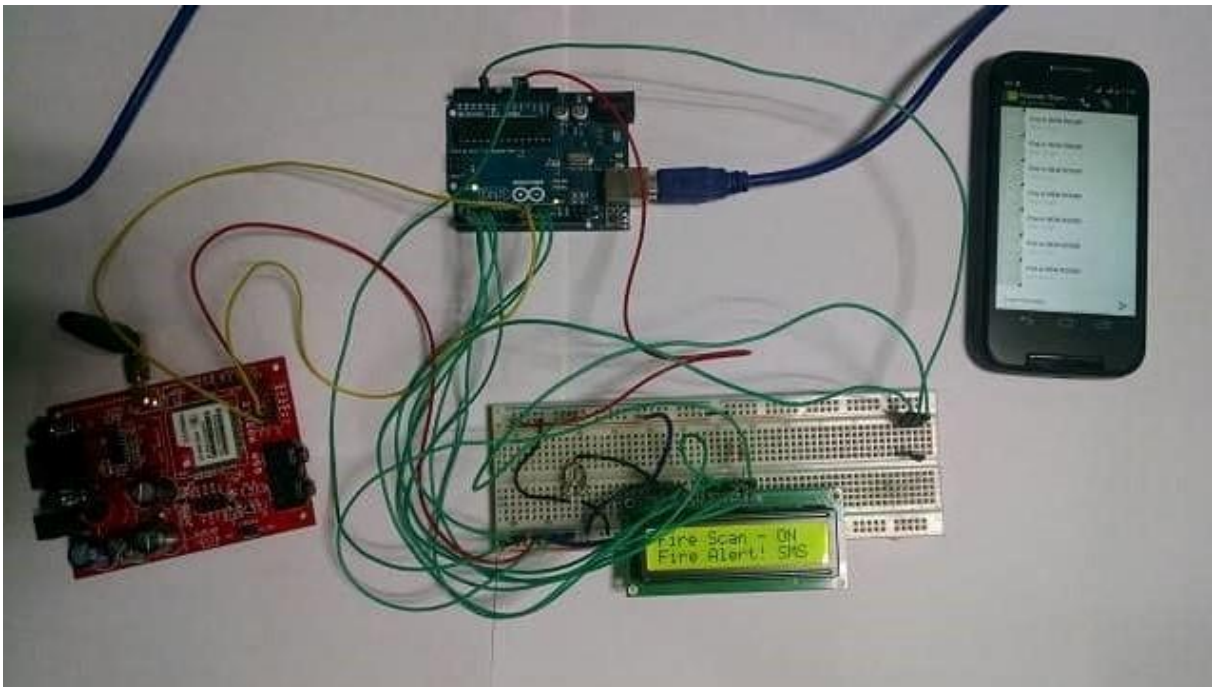
Module, the red LED light will jump every three second. The LED light of the GSM Module will flash and turn off every second until it does not get enough network.

The limit switch also remains in the normally open position with an equal amount of power in the activated position until a person enters, so that when the door is closed reverse bias is maintained through the switch changes its contact to receive forward bias and sends the signal received from the microcontroller goes to the GSM Module that the security alert call goes to the mobile phone.

Power section are connected with Arduino Nano module with the pins of 5V input pin and A7as an analog input pin. When power section provides 5V as a step-down voltage from adaptor voltage 12V our Arduino Nano operated with 5V.

3.4 Overview of Anti thief system

The Anti thief system is a smart security system now a days. It is very effective our daily life. We can make the Anti thief device by spending a small amount of money and the construction process of this device is very simple. The most important thing is that this device can play an important role in catching thieves. The main thing of this device is that in your absence, it will provide security to your precious car if you want it can be used in any car that has a roof rack.



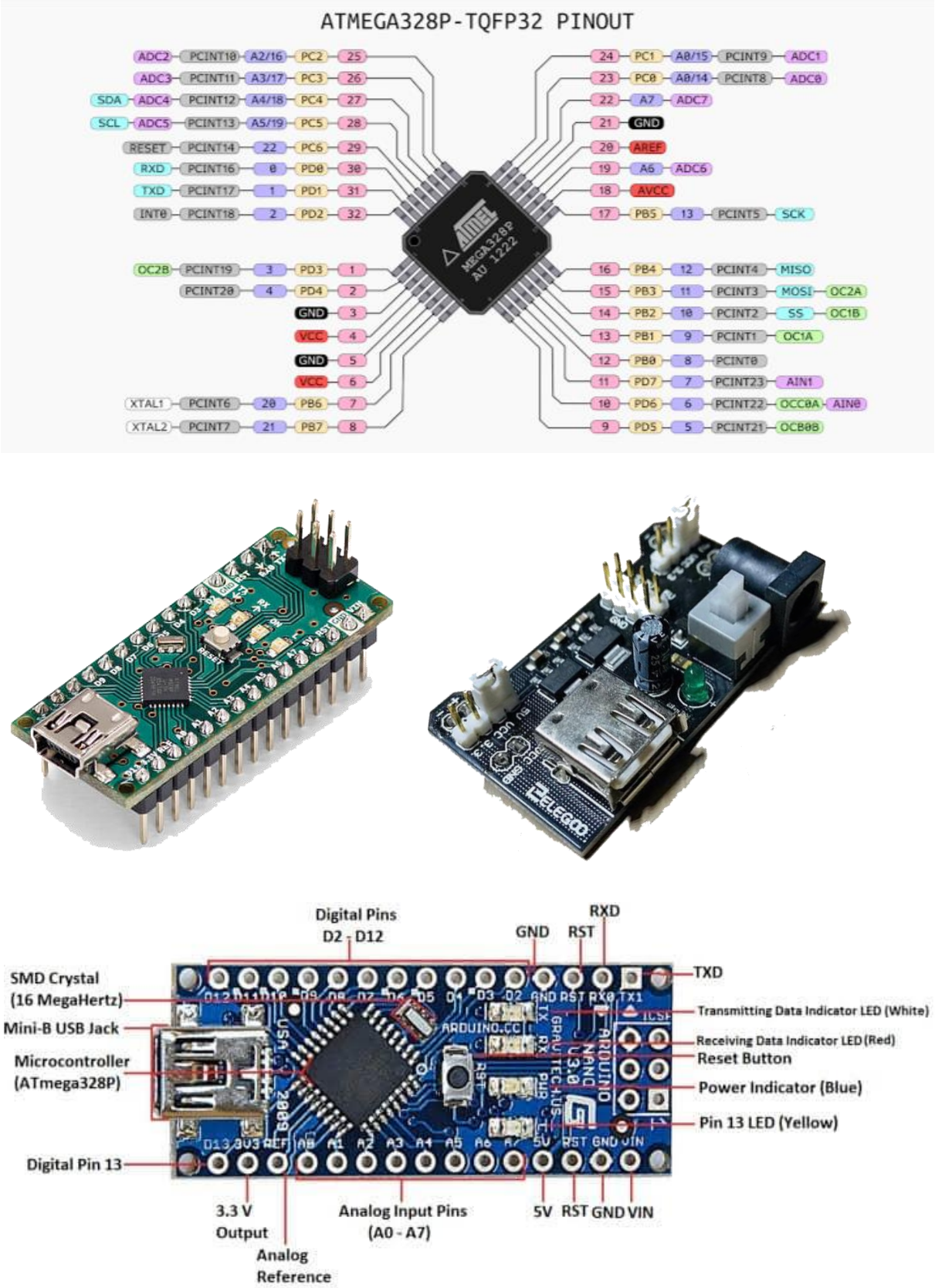


Fig : 3.4.4.1 : Overview of Anti Thief System

3.5 Working Principle

The picture above is the actual demo project we have. Now let's take a look at the step by step working process.

Firstly, we should connect the adopter with supply line voltage , after connecting 220V line voltage adopter takes only 12V, 2 Amp for output. The output of the adopter is connected with buck converter circuit to step down the adopting power from 12V to 5V is the perfect voltage ration for our system. When 5V enters the circuit through the buck converter, that voltage is spread evenly across all sections, such as microcontroller GSM – Module and limit switch functions limit switch physically on condition, its ready to detection the open position of door when open the door by anyone than GSM Module sense the instruction of person by the help of microcontroller. When GSM – Module sense the instruction from Microcontroller than GSM Module sent a voice call in our mobile phone, here mobile phone are connected with a sim programing. The program is ready and free of cost for Arduino corporation, we just modifying this program as our needs.

Sample of our Modifying Program.

File Edit Sketch Tools Help

PULL_DOWN_TEST_FOR_GSM

```
#include <SoftwareSerial.h>    //Create software serial object to communicate with SIM800L
SoftwareSerial GSM(8, 9); //SIM800L Tx & Rx is connected to Arduino #8 & #9

char phone_no[]="+8801987670113 "; //change country code and 01922917385 with phone number

#define bt_C  A1 // Pin A1 use for Call


char inchar; // Will hold the incoming character from the GSM shield

void setup(){// put your setup code here, to run once

Serial.begin(9600);//Begin serial communication with Arduino and Arduino IDE (Serial Monitor)
GSM.begin(9600);   //Begin serial communication with Arduino and SIM800L

pinMode(bt_C, INPUT_PULLUP); // declare bt_C as input


Serial.println("Initializing....");
initModule("AT","OK",1000);               //Once the handshake test is successful, it will back to OK
initModule("ATE1","OK",1000);             //this command is used for enabling echo
initModule("AT+CPIN?","READY",1000);      //this command is used to check whether SIM card is inserted in GSM Module or not
initModule("AT+CMGF=1","OK",1000);        //Configuring TEXT mode
initModule("AT+CNMI=2,2,0,0,0","OK",1000); //Decides how newly arrived SMS messages should be handled
Serial.println("Initialized Successfully");

}

void loop(){
```

Figure : 3.5 : Program for Project

3.6 Image of the Project



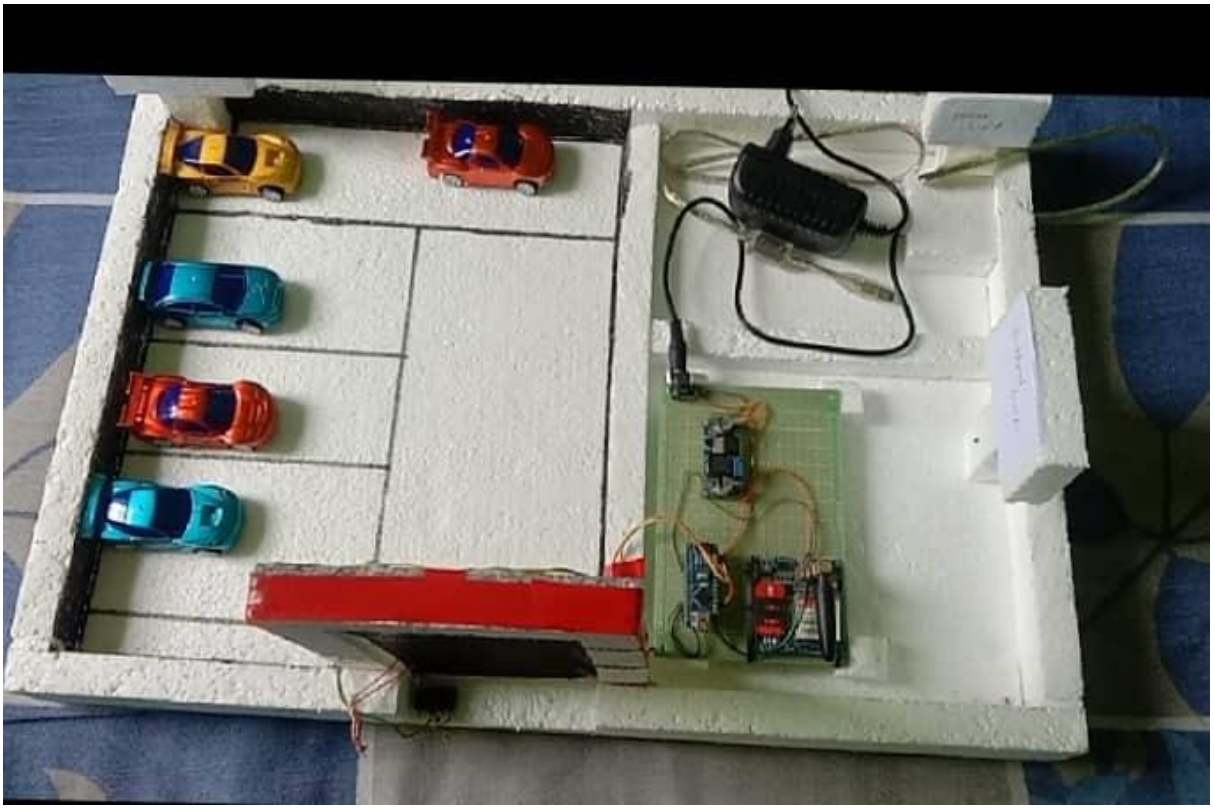


Fig : 3.6.1 : Real Image of The Project

3.7 Flow Chart

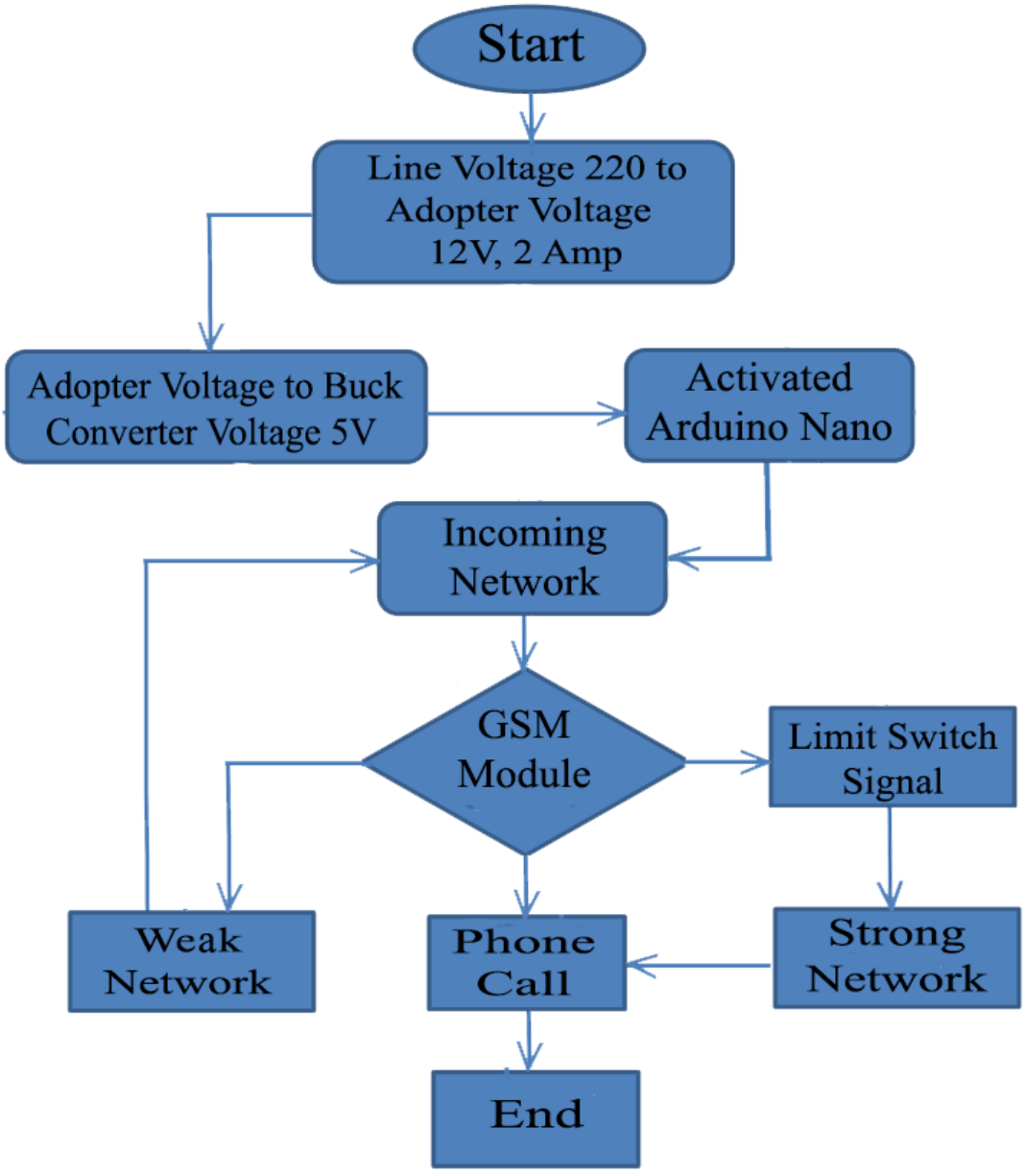


Fig : 3.7.7.1 : Flow Chart of The Project

In this flowchart we can easily determine the working process of our system. Starting with some control Firstly we convert our line voltage 220V to 12V with a adopter, after that it's also converted with a buck converter 12 to 5V. 5 Volt is the perfect operating voltage of our system. When active our project with a suitable voltage it activated the Arduino Nano Microcontroller

ATMega328P. Microcontroller accepted the network mode with making program for free for Arduino Corporation. GSM – Module are received the accessible mobile network to operated the phone call when a strong network received by the GSM Module and limit switch are sense the entry of the door then a phone call created in mobile phone as a security alert finally will complete our operation.

voltage, then the controller combines those two sources. For example if somehow solar source drops the threshold voltage, the controller switches the supply line to the wind source. If wind source drops the threshold voltage, the controller switches the supply line to the solar source. If both solar and wind source drops the threshold voltage, the controller combines (in series) the sources.

3.8 Used Materials

1	Microcontroller (Arduino Nano ATMeha328P)	1 pcs
2	Adopter 12V, 2Amp	1 pcs
3	Buck Converter Circuit	1 pcs
4	Limit Switch	1 pcs
5	GSM Module 2G	1 pcs
6	Integrated LED	4 pcs
7	Connector	2 pcs
8	Wires	As Needed.

3.9 Conclusion

In this chapter we have discussed the block diagram, circuit description, working principle, flow chart also shows the real image of the project and others. In the later part of this paper we discussed the result & discussion of the project to make the concept clear to anyone.

Chapter IV

RESULT & DISCUSSION

4.1 Introduction

This chapter contains the results obtained and discussion about the project. We have also covered discussions about advantages, disadvantages and limitation of current version of the protection system.

4.2 Result

- Due to increase in car theft, we want to eliminate these problems with our Anti – Thief device available to the general public so, that we can keep our precious cars safe.
- So, use the Anti – Thief device with any situation, where door is available it works very perfectly.

4.3 Advantages of the Anti – Thief Device

- It is very much possible to be alert before from losing valuable are.
- Fully automated.
- Low power consumption.
- It provides the easy access in dictation time.
- Low cost to design the circuit, maintenance of the circuit is good.
- By using the Arduino Nano we can create many more controls to the appliance.
- Easy convenience to handle.

4.4 Disadvantages of the Anti – Thief Device

- Although our project has many application and benefits of the project as well and the good thing is that these limitation are minor and doesn't affect the efficiency of the system.
- GSM – Module works very well in strong network but, when network will be poor quality or weak then GSM Module can't work properly. It's a major problem because the network power is not available everywhere.

4.5 Discussion

By implementing above systems there are various benefits.

- Continuously monitoring the movement of very person who entered the door.
- Don't need any labor cost. Since the systems are fully automatic they do not require to any labor cost.
- The design is low cost small size robust and highly versatile.
- This system use microcontroller which make it more convenient than conventional system.
- The main advantage is that the systems action to the limit switch sense and GSM Module receiving signal.

4.6 Cost Estimation

SL	Particulars	Specification	Qty. Pcs	Total Price (Taka)
01	Arduino Nano	ATMega328P	1	400
02	Limit Switch	TX and RX	1	60
03	Buck Converter Circuit	16x4	1	250
04	Adopter	12V, 2 Amp	1	350
05	Cable for Programing	Type B	1	150
06	GSM Module	2G	1	700
07	Vero Board	---	1	60
08	Connecting Wire	As Needed	1	50
09	Toy Car	---	5	100
10	Decoration with Cork Sheet	As Needed	1	50
11	Soldering Cost	---	--	50
12	Others	---	--	50
			Total Amount =	2270 Tk

Table : 4.1 : Cost Estimation

4.7 Applications

Some of the application are of the project has been pointed out below.

- The project is mainly used in the individual car, A car parking area where one or more dedicated door or gate also used in gate of a car garage where many cars are parked for a long time.
- It works by two way of receiving and transmitting system.

4.8 Conclusion

The Microcontroller Based Anti – Thief devices has been designed, construction and tested to ensure validation of its function and operations. In this research we have succeeded in security phone call a normal phone call also we are much able to catch the demo thief. The system is effective and cost of production is very low.

Chapter V

CONCLUSION

5.1 Conclusion

This project is very useful for security purpose. Its play an important role where vehicle safety is required. It will notify you by calling the mobile directly through the GSM System. Now a days GSM system is a smart mobile network system. We are committed to making a smart security to valuable vehicles.

5.2 Future Work

At present we have made a Anti – Thief device with a simple and basics concept. We are thinking about adding many feature to get more desirable outcomes some of the future scopes are given below :

- We looking forward to future improvements to make our system design more efficient. In the future we plan to add additional features, to the system. Such as surveillance – Camera, monitoring, Ultra – Sonic – Motion Sensor for detection the picture and voice of thief.

References

Books :

[1] Michael McRoberts, Beginning Arduino.

Software :

[2] Arduino IDE 1.0.6 from https://www.arduino.cc/en/main/software.

Web Address :

[3] www.circuitstoday.com

[4] www.engineersgarage.com

[5] www.learn.adafruit.com

[6] www.instructables.com

Appendix

Code :

include <SoftwareSerial.h> //Create software serial object to communicate with SIM800L SoftwareSerial GSM(8, 9); //SIH800L Tx a Rx is connected to Arduino #8 c #9
char phone_no[]="+8801987670113 "; //change country code and 01922917385 with phone number
#define bt_C Al // Pin Al use for Call
char inchar; // Will hold the incoming character from the GSM shield
void setup() { // put your setup code here, to run once

Serial.begin(9600); //Begin serial communication with Arduino and Arduino IDE (Serial Monitor)
GSM.begin(9600); //Begin serial communication with Arduino and SIM800L
pinMode(bt_C, INPUT_PULLUP); // declare bt_C as input

Serial.println("Initializing....");
initModule("AT","OK",1000); //Once the handshake test is successful, it will back to OK
initModule("ATE1","OK",1000); //this command is used for enabling echo
initModule("AT+CPIN?","READY",1000); //this command is used to check whether SIM card is inserted in GSM Module or not
initModule("AT+CMGF=1","OK",1000); //Configuring TEXT mode
initModule("AT+CNMI=2,2,0,0,0","OK",1000); //Decides how newly arrived SMS messages should be handled
Serial.println("Initialized Successfully");
}
void loop(){
if(GSM.available()>0)(inchar=GSM.read(); Serial.print(inchar);
if(inchar==’R')(inchar=GSM.read();
if(inchar==’I’)(inchar=GSM.read();
if(inchar=='N')(inchar=GSM.read();
if(inchar=='G'){
initModule("ATH","OX",1000);   // this command is used for Call busy
                }
            }
        }
    }
}
if(digitalRead (bt_C) == 1){callUp(phone_no);}
delay(5);
}
void callUp(char "number)(
GSM.print("ATD + "); GSM.print(number); GSM.println(";"); //Call to the specific number, ends with semi-colon,replace X with mobile number

```
delay(20000); // wait for 20 seconds...
GSM.println("ATH");  //hang up
if(digitalRead (bt_C) == 1){callUp(phone_no);}
delay(5); }
void callUp(char *number){
GSM.print("ATD + "); GSM.print(number); GSM.println(";");    //Call to the specific number,
ends with semi-colon, replace X with mobile number
delay(20000); // wait for 20 seconds...
GSM.println("ATH"); //hang up
delay(100);
}

void initModule(String cmd, char *res, int t)
{while(1)(
Serial.println(cmd);
GSM.println(cmd;
delay(100);
while(GSM.available()>0)(
if(GSM.find(res))(
Serial.println(res);
delay(t);
return;
lelse{Serial.println("Error");}
delay(t);
  }
}
```