NEW HORIZON
COLLEGE OF ENGINEERING
New Horizon Knowledge Park, Ring Road, Marathalli
Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade, Accredited by NBA

Department of Electrical and Electronics Engineering

20Eel68 - Mini Project

Report on

GSM based water pump controller

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Under its guidance
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The submitted for partial fulfillment of requirements
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In
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"Jnana Sangama", Belgaum – 590018, Karnataka, India

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Department of Electrical and Electronics Engineering

Bonafide Certificate

The work on a short project called "GSM based water pump controller" conducted by Kiran K V (1NH 19Ee400), Sushma M (1NH 19EE403), Sushmita TS (1NH 19EE404) certified as trusted students of New Horizon College of Engineering, submitted a report after completion of the project in the Department of Electrical and Electronics Engineering. New Horizon College of Engineering in the academic year 2020-2021.

It is certified that all amendments/suggestions prescribed for internal evaluation are included in the report deposited in the departmental library. The project report has been approved that educational requirements have been satisfied with respect to the project work prescribed for the said degree.

Project Guide	**HOD-EE**
Vinod Kumar S	**Dr. Mahesh M.**

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(Internal Examiner)	(External examiner)

Receipt

With immense joy and a deep sense of gratitude, we would liketo express sincere thanks toour supervisor Dr **Vinod Kumar S,**associate professor in the Department of Electrical and Electronics Engineering, New Horizon College ofEngineering, without his motivation and constant encouragement, this mini project would not have been completed successfully.

We are grateful to **Dr Mohan Mangnani,** Chairman, New Horizon Institute of Education for inspiring us to conduct research at the NHCE and providing the infrastructure facilities and many other resources required for our project work.

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Dr. Dr. We express my sincere thanks to M Mahesh, HODfor their support and encouragement.

We would like to give my deepest gratitude to my parents for all the sacrifices they made during our project and for providing us with moral support and encouragement when needed.

Date:
Location: Bangalore

Declaration

We announce this project titled **Kiran K V - 1NH 19EE400, Sushma M - Sushmita TS- 1NH 19EE404,** New Horizon College of Engineering, phase-lof thisproject titled**"GSM based water pump controller",**is anoriginal and reliable work carried out at New Horizon College of Engineering for partial fulfillment of Bachelor of Engineering in Electrical and Electronics Engineering, Visvesvaraya Technical University, Belgaum.

According to our knowledge and belief, we declare that the work reported here will not be part of any other essay or essay based on the degree or award given by any student in the previous case.

Abstract

Fast-moving mobile communication technology. And that will reduce the cost and it will made with applied to the mobile scheme communication into the houses. The development report on **"Use GSM based water pump controller ARDUINO"** offers an elaborate look at the design and work of the project.

The report has been divided into parts to explain the development in a phased manner of the mission. This idea has to be included to our module and hands over info on used technologies. The next section is given to statistics on the use of equipment then the project work with the programming code is last described asgiven the project's merits, d-merits and future predictions. This system monitors the conditions of the park, such as pumping orders on/off from a mobile phone. It supplies water to plants. Water pumps are controlled by Arduino, an important part of the electronic system. Users have the ability to monitor the conditions of the park on their mobile phone. This system can facilitate monitoring, give control flexibility, which saves time and human labour and increases productivity as a result of controlling the water pump.

Contents

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Chapter. 1

Introduction

Introduction.

1.1. Introduction

Now days all are improving in the world all are being to do a logically and compact, used in smart knowledges. Mobile technologies added is the more advance to the region. This and all make a simpler and more linked. Nowadays nearly everybody who knows about its use is able to benefit from it. Communication technologies are ever evolving. Worldwide Scheme for Portable Message (basically groups different transportable) it will be representing the additional generation of mobile communication. It remains a numerical telephone system used in much the world, in this technique used to many purposes. GSM will be digitizing and wrappings data. Then forward to the channel downhearted with order torrents of operator data. It works in a 900-mhz frequency band.

GSM provides subscriber identification to the module (SIM) to each user. It is a removeable card that founds the user explanation to the network and its given to the identification of that admit the correctable billing. GSM's unique roaming features allow Cellular subscribers to use at all gsm given to the world where their supplier has a peripatetic contract.

agriculture is the technical development of theatrically peeling liquid into the land or soil educated. Conventionally in in need of a drink areas with low precipitation, water has to be supplied to the hand pumps and waterways. The traditional approach had severe problems such as increasing the workload of agricultural workers and it advertises for a problem like irrigation and soil leaching.

Developing an technical-based automated agricultural arrangement accomplished of supervisory several electrical appliances in agricultural sectors.

1.2. Motivation

This system is preparing to the third-year effort as an engineering student. The selected plan is to enable home automation through mobile technology. This has been chosen because we have faith in that the following significant stage towards realising homebased automation is to include mobile technology with equipment control. The control taken to the device from a specific place is inevitable as it will be reducing more time and effort.

1.3. Problem Statement

This project is newly more over the past couple of decades this has make life more adequate and evaluable. The well-being intelligent to take controller of the device from a particular place is inevitable from saving a lot of time and work. Therefore, the system we have proposed will expand the way in which the control system is automated. People who have forgotten to made a simple effect like turning on and off plans in their homebased and on agricultural land will come into our hands. They will be now not there can transmitting a simple text message from their mobile phone.

Chapter. 2

Apparatus

2.1. Equipment

a)GSM 800A

b). AADUIno UNO

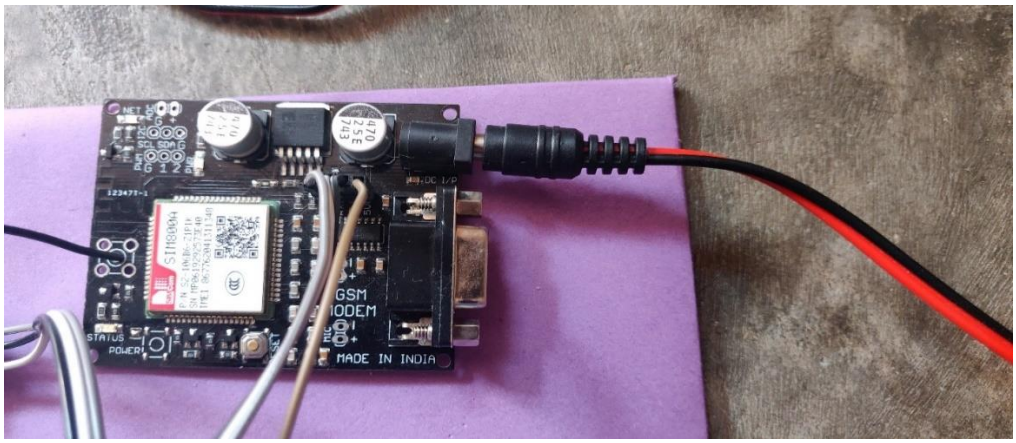
c)Relay Module

d)Water Pump

e) Buck Converter

F). Connection wires.

2.1. 1.GMM Modem 800A:

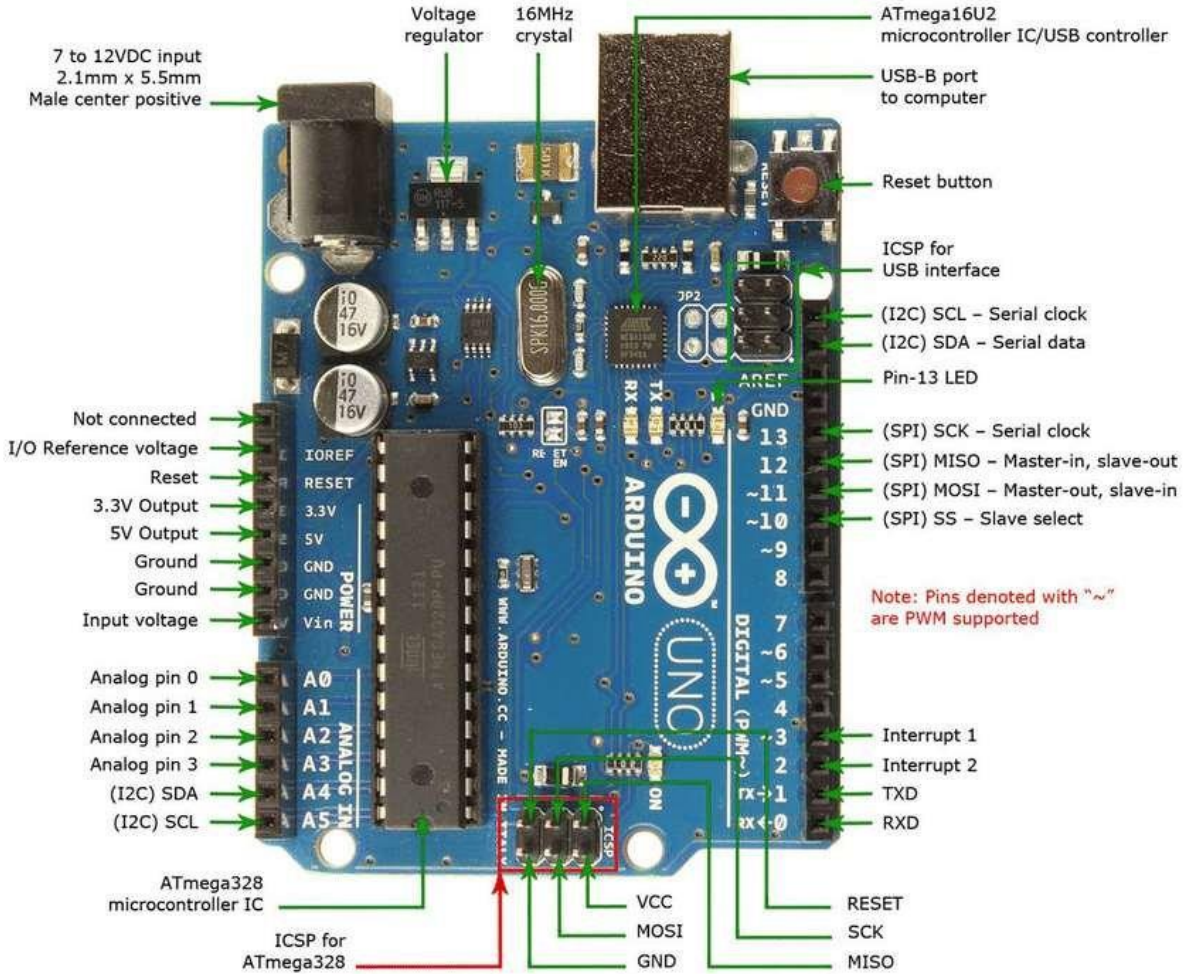


According to a GSM modem special, it accepts sim card and operates on contribution to mobile operative, like a mobile telephone. Mobile operator from prospective, GSM modem is same as the mobile phone.

GSM Module reveals an interchange that access an app like SMS that sends and receives messages via modem interface. The mobile operator has charged for distribution and getting this message will send directly to the mobile phone. To do this task, GM Should support "Extend at Command Set" to send and receive a messages.

The SIM800A GSM module with rs 232 line is a whole quad-band GSM/GPRS explanation in a land grid sequence kind that can be entrenched in client requests. It supports quad-band 1900 mhz, which can communicate sound, short massage and information decreases the power feedings. The GSM modem hardware device uses to GSM mobile phone technology to give the statistics link to isolated network. It usually provides TTL-level is the serial connection to their host. They will usually use to the part of embedded system.it, an open and digital cellular technology used to transmit mobile sound.

2.1.2. ARDUINO UNO



Microcontroller is the smallest chip in computer in a simple combined circuit with processor core will be memorable and programmable inputs and outputs, and in difference to the microprocessor used on individual computers or additional shared purpose application),it will reduce the size and cost related to the design using isolated microprocessor, RAM and input/output strategies, microcontroller will also digitally to the regulate large number of devices and the processes.

Atmel Core associations a rich condition with the 32 general purpose work records. All 32 registers was connected to the arithmetic logic operating system, accept the to independent registers to arrive in a single notice performed in a block cycle. As a result archectismoreeffective.

PIN description:

1. **Voltage Controller:**

   Voltage controller will be converting the voltage to 5V. The main purpose of voltage controller is to limit the voltage level take to the Arduino board. Level if there are any unwanted signals in the supply voltage of the controller.

2. **Crystal Oscillation:**

   The oscillation frequency of the 16MTAs, which gives a clock signal to the microcontroller of Arduino Uno. This delivers to the basic time and regulator to the board.

3. **Reset switch:**

   Reset switch is used to a reset the microcontroller board. It is optional to press this push button when we are flash the code to the board.

4. **USB Pin:**

   USB will be used to the interfacing of the plug on USB cable. This port will be supplied to the power supply of 5V to the microcontroller board.

5. **Vin:**

   Vin is used to the regulated DC supply voltage which is used to control ICs used in the relationship.

6. **SCL and SDA:**

   Serial Clock (SCL)Is the transferring the clock data used to match the shift of the two devices (master clock and slave clock) of Data B/W. Series Data (SDA) This is defined as a line used to send and receive slave and master data.

7. **SPI (Serial Peripheral Interface):**

   A serial peripheral interface used in a microcontroller to communicate quickly with one or more external devices.

8. **External interruptions (2 pin and 3 pin):**

   External interrupts pins are used to trigger a change in the low value, exciting or falling to the edge or value.

9. **Txd and Rxd:**

   Transmitting the data and receiving data pins are used for the serial communication. TXD uses data to communicate, and RXD receives data. It also represents a successful flow of data.

10. **Light emitted diode (Led) (13):**

    The microcontroller board has a in-built lead interconnected to digital PIN 13. When this pin will be glows high or 1 lead switched on, when the pin will be off lead is low or 0, microcontroller turning off.

11. **Pulse width modulation Pins:**

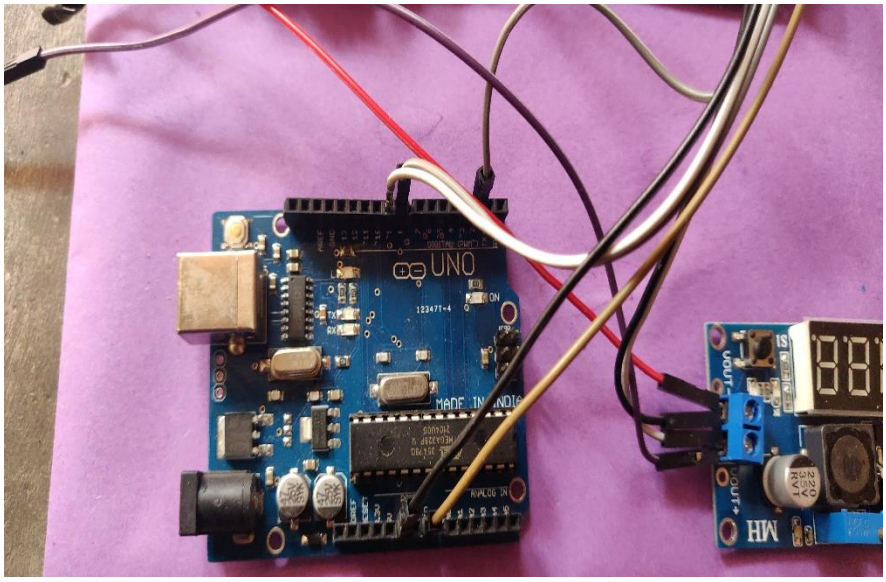
    Pulse width modulation is the analog value is being to be modulate the digital signal. Suppose you want a DC motor to run some analog voltage between 0 and 5V.

12. **Gnd:** GroUND.

Specifications of microcontroller:

a. **Microcontroller-**EtimegA328P
b. **Operating Voltage-**5V
c. **Input Voltage-**7-12V
d. **Digital I/O Pins-**14Pins (6 PWM Production Pins)
e. **Analog input pins-**6
f. **DC Current I/O Pins-**40MA
g. **Flashy Memory**-32KB

h. **Clock Speed-**16MM



Arduino Uno is the microcontroller sheet built on ATMega328P. It has included 14 digital input and output pins, six analog inputs, 16 MHz Quartz Crystal oscillator, USB construction, power card, ICSP shot and reset switch.

microcontroller is the open-source to the electronics display place used as hardware and software of the system. It will be able to read the input-light, finger or message on the button in the sensor and convert it to enable output.

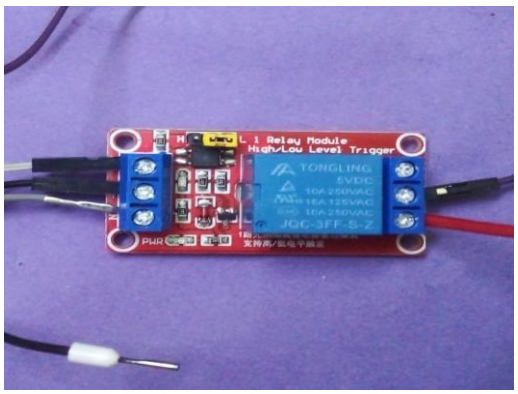
2. Relay module:

Relay is an electro Mechanicals a device. They are used to replace them. The current supplied through the relay coil of the relay generates a magnetic field it will attracts the device and changes shift connections. The advantage of the relay used as a switch is provide to the electrical separation between input with help magnetic link and using relay We are reduce great power Manageable.

The relay switch is a one or additional poles, individually of its connections can be frightened away by emerging a coil in one of the other ways.

- Normally open **(no) coil** connections connect the circuit when the relay is operated condition. The circuit was disabling the when the relay is disabled. It is also called Form a Contact or "Make" contact.
- Usually closed **(NC) coil** connections disconnect the circuit when the relay is operating condition. The circuit is connection same when the relay is disabled. It is also known as Form B connections or "pause" connections.
- Changeover**(CO)**or Dual Throw (DT) connections control twice circuits. Usually the connection opens and usually closes contact with the normal terminal. It is also known as form C connection or "transfer" connection ("break before doing").

The power relay module is an electric switch operated by an electromagnet held in place by spring, which leaves a gap in the archermagnetic circuit when the relay is de-energetic. While in position, one of the two sets of connections is closed and the other set is stable.



3. Buck Converter:

Buck converter is aDC-to-DC power converter that drops voltage (when pulling low average current) from its input to its output. It is usually a category of switched mode power supply consisting of two semiconductors (diodes and transistors) and energy storage factors a depositor and inductor, in combination with two. To reduce voltage rippals, filters made of the depositor and usually add to such converter output and input side. Here we are using dc-DC buck converter whether it is taking power from input adopter 12V and converting 5V output into controlled power supply. It removes unwanted signal and filters input supply voltage and is given to output.

Specification of Buck Converter:

Input Voltage-DC 4.5V ~ 40V

Output Voltage- 5V

Output Current-2A

With reverse connection protection

5. Water pump

A water pump is an essential tool for draining water from a garden, pond or ground.it and controls the speed of water and is incredibly useful for preserving water. The pumps come with various designs and capabilities to meet the various requirements of water pumping.

Arduino is connected to a water pump through the relay. So before moving on, we need to connect the relay board to Arduino. So contact the relay pin to Arduino Pin2. Next the relay is connected to the water pump power supply. Relay peon is not connected to the terminal of any water pump. Another terminal of the water pump should be connected from 5V DC to DC Buck Converter. Finally connect the normal pin of the relay to the negative power supply.

7. Connecting wires

The connection lines allow the current to travel from one point to another in one circuit because electricity requires a medium that can move. Most connection wires are made of copper or aluminium.

Chapter 3

List of Components

3. Apparatus List

The list of the apparatus used is in listed below:

Apparatus Sample/Range Scale
GSM Modem SIM 800A 1
Arduino UNO - 1
Buck Converter 12V/5V DC 1
Relay 5V DC 1
Water Pump 1
Power Adoption 230V/12V DC 1
Wooden Plank 1
Arduino Nano Cable - 1
Connection Wires - As required

Chapter. 4

Operation and

Programming Code

4. Operation:

The chapter is the deals with the "SMS based control system using GSM modem". The chapter can also introduce the programming used in the microcontroller.

4.1. Work:

We have tried to simplify/plan as much as possible to make it easier for everyone from beginners to experts.

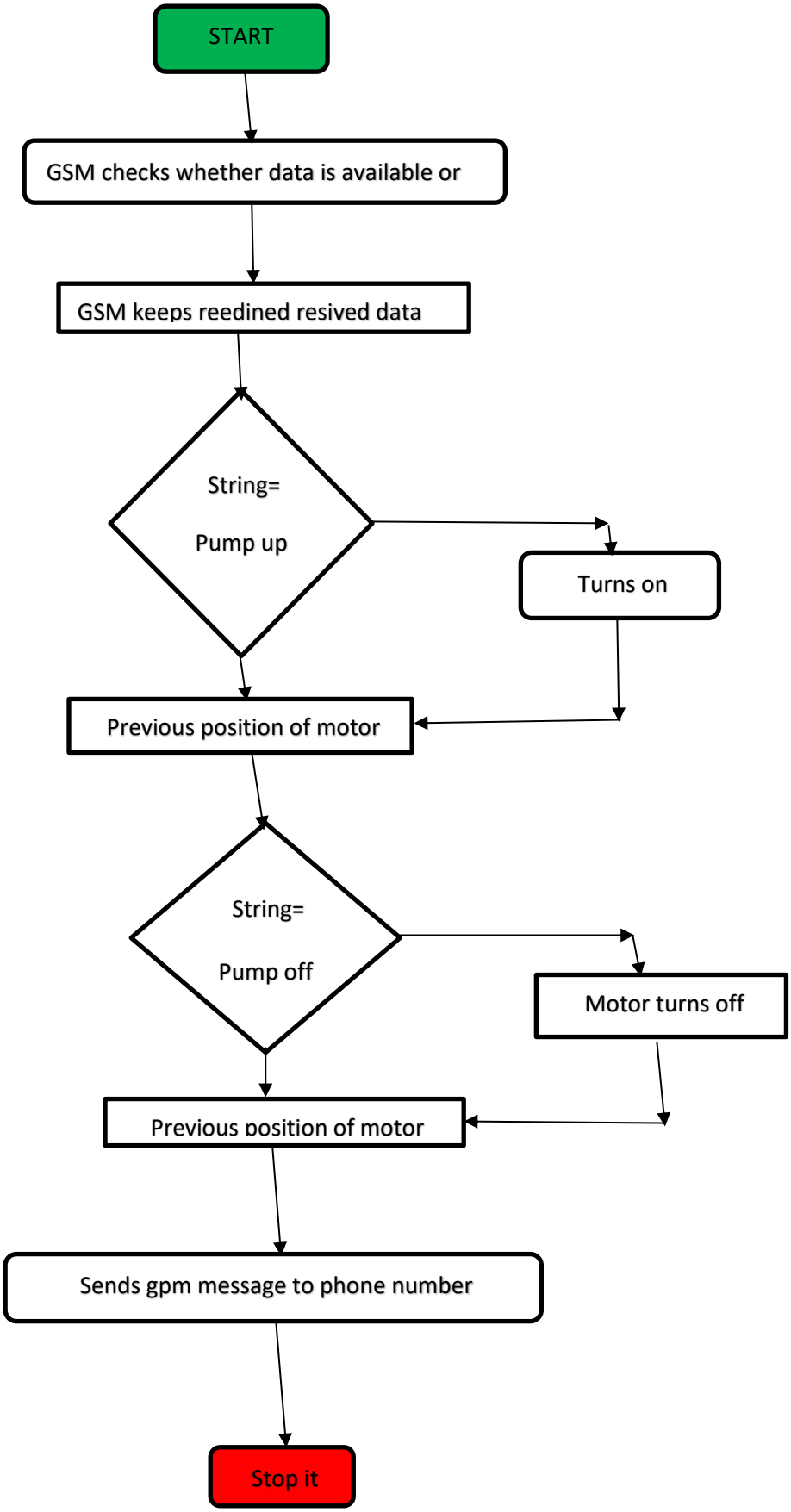
The idea behind this project will be used in existing GSM infrastructure. Hence, we have all operations involved gsm system. As we send SMS it goes through GSM system. We can send SMS by using SIM card and GM module. We must use them on orders to manage any GMM am.

I will explain the work of gsm based water pump control system. GSM Modem is connected to Arduino Uno. The GSM sample receives a message to the farmer "pump on". Then forward this massage to the GSM module as a symbol for the Arduino board.

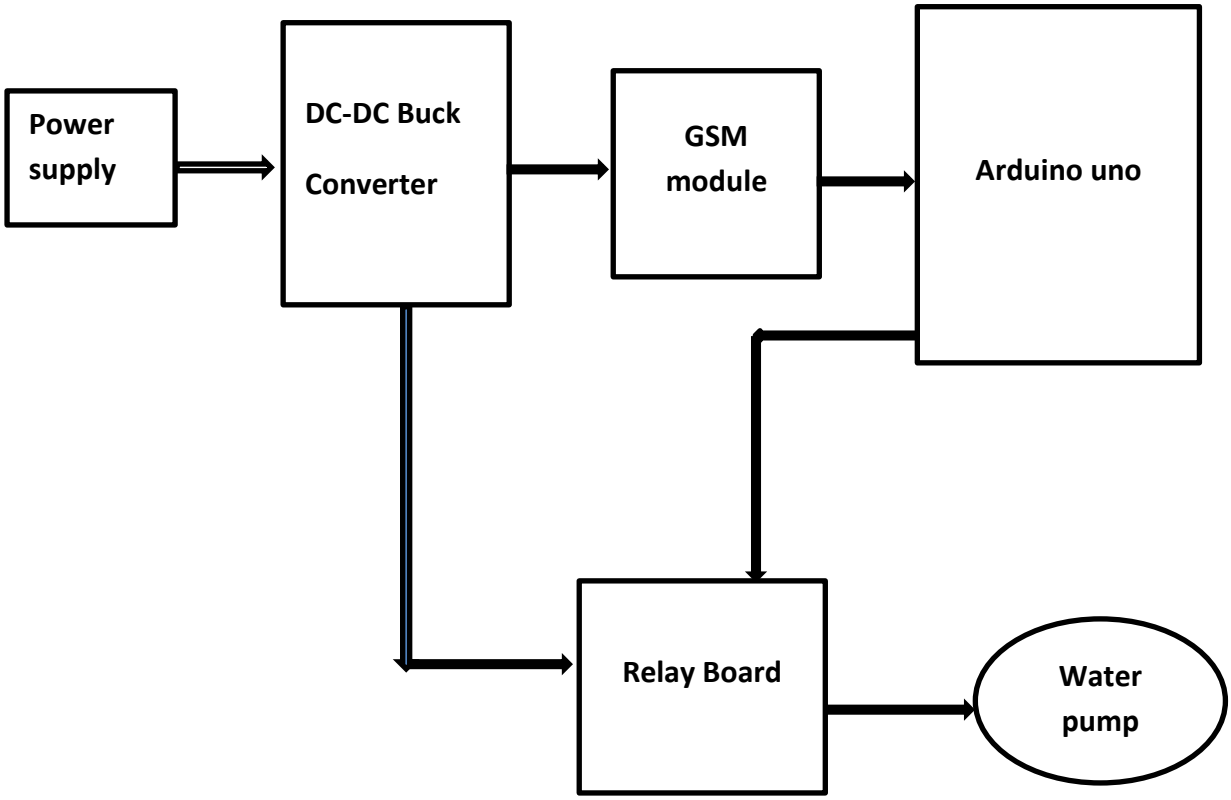
After this, Arduino highs relay input, as a result of which turns on the water pump and in this way our plan will start water supply to crops.

The procedure is the same when the water pump is turned off, this time the farmer sends a massage to the pump of command relay output is less motored off.

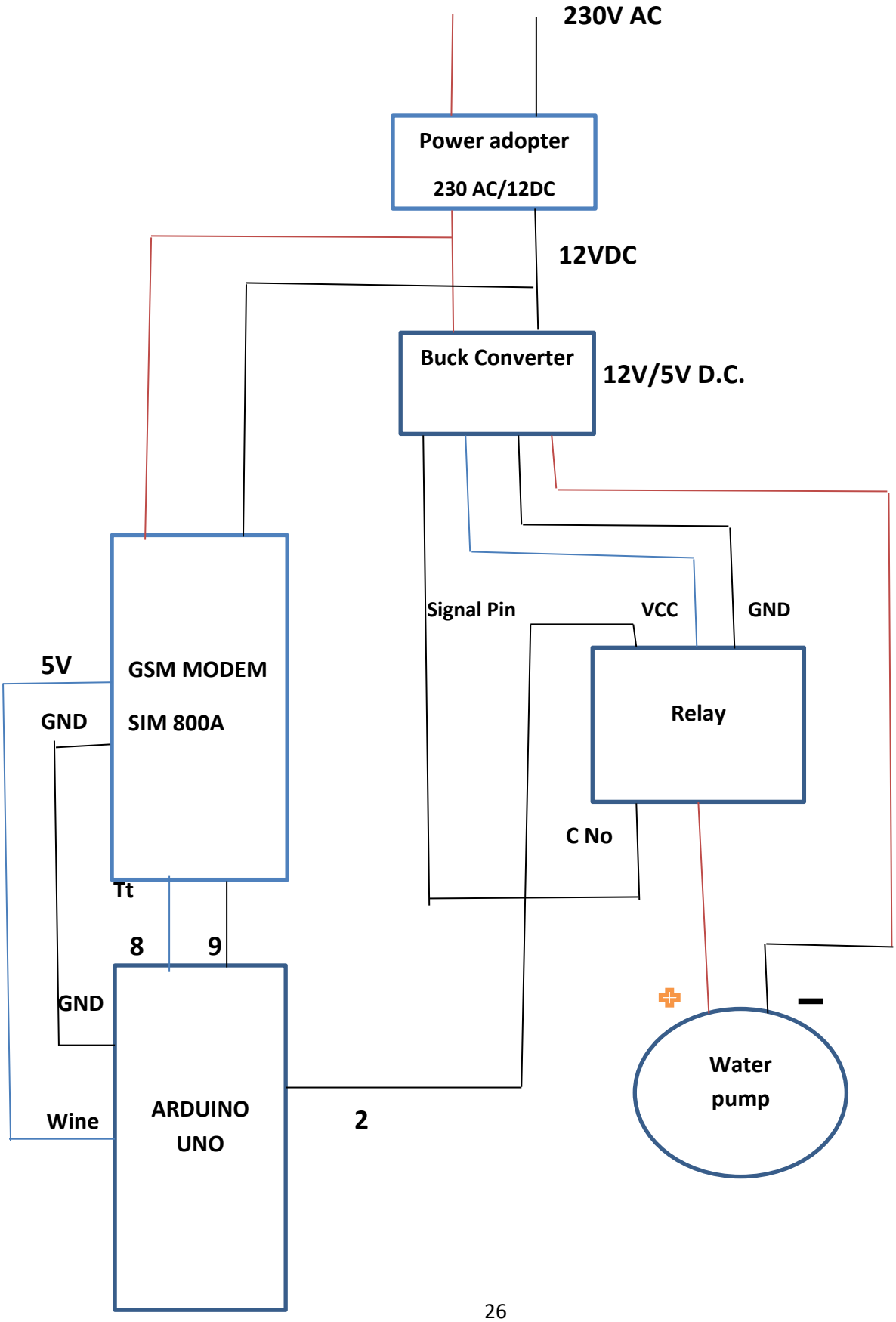
We pull the flow chart for a deeper understanding of the work



4.2. Block Diagram



4.3. Circuit Diagram:



4.4. Programming code:

AMAPA 168 works in both analog and the digital signal. The code of the microcontroller is done with compiler of Arduino Uno, it will be open source free compiler.

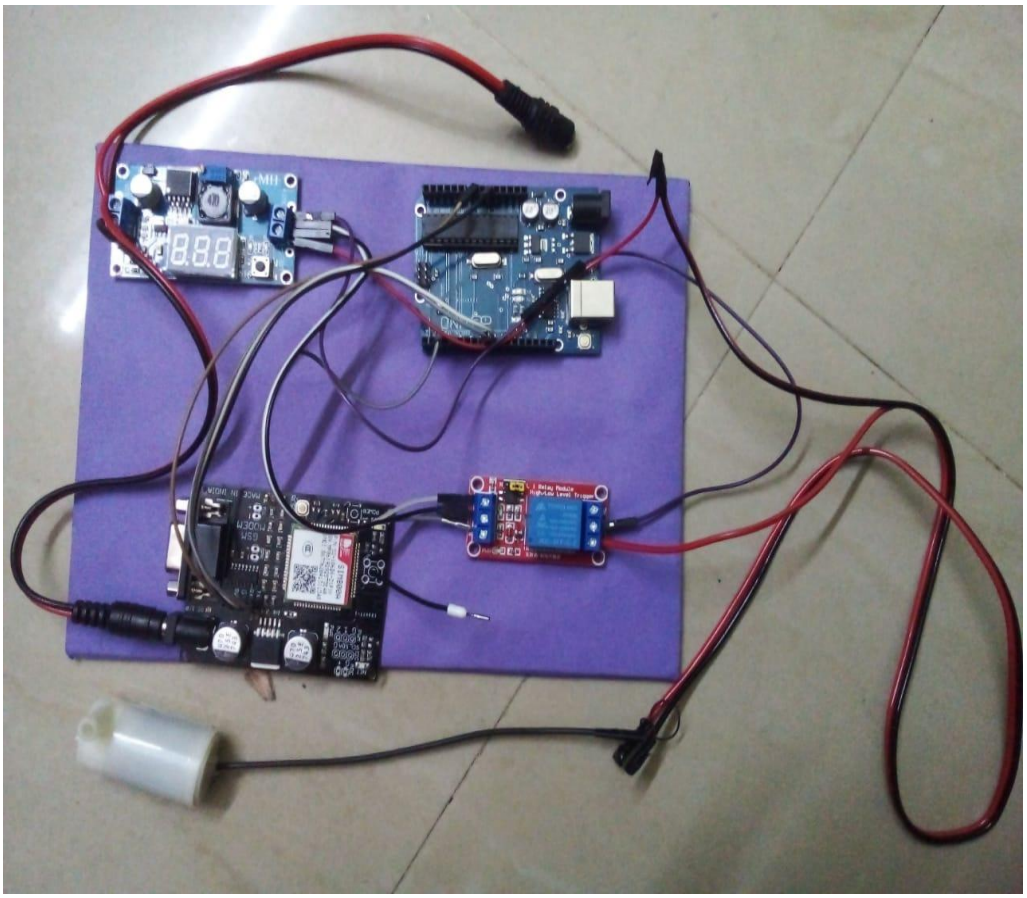
The programming code is given below.

```
#include<EF Prom. H>

#include<Software Serial.H>

Software Serial GSM (8,9)

No string phone_ 1=" +9178483057515";

String phone _no 2=" +919632090425";

String rx string=";

Charrxcher ="";

Int Counter =0;

String GSM NR=";

String GSM_MSG=";

#define Relay1 2;

#define Relay2 3;

#define Relay3 4;

#define Relay4 5;

IntLoad1, Load2, Load3, Load4;

Zero setup () {

Pin mode (relay1, output);

Pin mode (relay2, output);

Pin mode (relay3, output);

Pin mode (relay4, output);

Serial. Start (9600);

Goes
```

```
mobile phone. Start (9600);
Load1=EF PROM.Read1;
Load2=EF Prom.Read2;
Load3=EF PROM.Read3;
Load4=EF PROM.Read4;
Relay ();
Delay (100);
}
Zero loop () {
Rx string='';
copy=0;
(When GSM is available ()) {
Delay (1);
Rxcher=Char (Read GSM);
If (per<200) {
Rx string.conter (Rxchar);
Counter=Counter+1;
}
}
(If accepted (F('CMT:') If MS is received ();
If (GSM_Nr=pnone_no1|| GSM_Nr=phone_no2) {
SMS (GSM_Nr, send loads);
}
Eeprom_write ();
Relay (0;
}
Zero relay () {
Digital Writing (Relay1, Load1);
Digital Writing (Relay2, Load2);
```

```
Digital Writing (Relay3, Load3);
Digital Writing (Relay4, Load4);}
Zero Int Module (String cm, Char *Res, IntT) {
(1) {
Serial. Println (cm)
GSM Printlon (cm)
Delay (100);
(GM.app.appt) >0) {
If (Find GSM R(Reset)) {
Serial.Println (Reset);
Delay (tIME);
Return 0;
} Different (order.print("error");}}
Delay (time);
}
}
```

Horware Module:



Chapter 5

Advantages and disadvantages

5. Advantages and Disadvantages:

This project was done with capabilities and dedication. Details were taken about making it. Various measures were a problem faced to eliminate problems.

5.1. Advantages:

1. The device can control over long distances.
2. A means of austerity.
3. It will be Easily applied to the household application.
4. This Can be used everyone with the just knowledge of sending the SMS.
5. SMS set-up is simple to the understand and written.
6. It saves farmers time and money.
7. Increases productivity.
8. It has so much to design and execute.

8.2. Disadvantages:

1. System networks depend. So. Connectivity can be decrease to the dependability of the system.
2. Users can made to a mistake when entering the massage format.

Chapter. 6

Applications

6.1. Applications:

Previous chapters show the advantages and disadvantages of the project. This scheme can also be used for the following areas:

1. Home applications, it was the seed to emerging the awareness of the plan.
2. Remote controlling devices.
    a. It helps to remove the human personal essential to operate a device that has been switched on/turned off.
    b. This helps in controlling devices though joining to the additional work.
    c. Users can be control to the device if they forget to do it through leave-taking to some other place.
3. Energy conservation purposed used.
4. Agriculture system.

Referance:

1. MJV and Erworf's paper on "enabling home automation system through mobile technology".
2. GSM Technology-Wikipedia.
3. Statistics sheet of the ATMA 168.
4. www.motorla.com-mutual lying of expedient information.
5. Lad's Guru Workshop-Programming Details.