

GSM BASE SOIL MONITORING SYSTEM

A Project and Thesis submitted in partial fulfillment of the
Requirements for the Award of Degree of
Bachelor of Science in Electrical and Electronic Engineering

Submitted By
Mohammad Parvez Bhuyan
ID: 151-33-2378
Nahid Hasan Joni
ID: 151-33-2402

Supervised By
Mr. Md. Mahmudur Rahman
Assistant Professor, Faculty of Engineering
Department of EEE



DEPARTMENT OF ELECTRICAL AND ELECTRONIC
ENGINEERING
FACULTY OF ENGINEERING

DAFFODIL INTERNATIONAL UNIVERSITY
December 2018

TO
OUR BELOVED PARENTS
&
HONOURABLE SUPERVISER
Mr. Md. Mahmudur Rahman

Certification

This is to certify that this project and thesis entitled “GSM base soil monitoring system” is done by the following students under my direct supervision and this work has been carried out by them in the Department of Electrical and Electronic Engineering under the Faculty of Engineering of Daffodil International University in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic

Engineering. The presentation of the work was held on December 2018

Signature of the candidate

Name: Mohammad Parvez Bhuyan
ID: 151-33-2378

Name: Nahid Hasan Joni
ID: 151-33-2402

Signature of the supervisor



Mr. Md. Mahmudur Rahman
Assistant Professor, Faculty of Engineering
Department of EEE
Daffodil International University

CONTENTS

	PAGE NO
CERTIFICATION	ii
LIST OF FIGURES	vi
LIST OF TABLES	vii
ABBREVIATIONS xi	viii
ACKNOWLEDGEMENT	ix
	iii

ABSTRACT		x
----------	--	---

CHAPTER 1	INTRODUCTION	PAGE NO
1.1	INTRODUCTION	1
1.2	PROBLEM STATEMENT	1
1.3	OBJECTIVE	2
1.4	AIM OF THE PROJECT	2
1.5	FUTURE SCOPES	2
1.6	METHODOLOGY	3
1.7	ORGANIZATION OF THE REPORT	3

CHAPTER 2	LITERATURE REVIEW	PAGE NO
2.1	Introduction	4
2.2	General Block Diagram	4
2.2.1	Block Diagram Description	5
2.3	Circuit Diagram	5
2.3.1	Working Process Of Our Circuit	6
2.4	List Of Components Used In Circuit	7

CHAPTER 3	COMPONENT DESCRIPTION	PAGE NO
3.1	Introduction	8
3.2	Arduino Nano	8
3.2.1	General Pin Functions	9
3.3	Display 16x2	10
3.4	Soil Sensor	11
3.4.1	Specification	12
3.5	Battery Adapter 9v	12
3.6	Gsm8001	14

3.7	Buck Converter	15
3.8	Jumper Wires	16
3.9	Electro Light Capacitor 100uf And 10 Uf	17
3.10	Potentiometer 10k	18
3.11	Breadboard	20
3.12	DC Motor	21
3.13	Relay Shield	22
3.13.1	Features	22

CHAPTER 4	SOFTWARE ANALYSIS	PAGE NO
4.1	Introduction	24
4.2	Description Of Our Software	24
4.3	The Compiled Window Of My Code Showed Below	25
4.4	Flow Chart Of Our System	26

CHAPTER 5	RESULT AND DISCUSSION	PAGE NO
5.1	Introduction	27
5.2	Interfacing Lm393 Soil Sensor Comparator With Arduino Microcontroller	27
5.3	Connection Of Arduino With Gsm Module	28
5.4	Operation The System	29

5.5	Results	30	CHAPTER 6	CONCLUSION	PAGE NO
6.1	Introduction	31			
6.2	Advantages	31			
6.3	Disadvantages And Limitations	32			
6.4	Future Scopes	32			

LIST OF FIGURES

NAME OF THE FIGURE	PAGE NO
Fig2.1: General Block Diagram	04
Fig 2.2: Two Connection Diagram	05
Fig 3.1: Arduino Nano	10
Fig 3.2: LCD Display	11
Fig 3.3: Soil Moisture Sensor	12
Fig 3.4: Adapter (9v)	13
Fig3.5: GSM 800L	14
Fig 3.6: Buck Converter	16
Fig 3.7: Jumper Wires	17
Fig 3.8: Electro Light Capacitor 100uf,10uf	18
Fig 3.8:Potentiometer 10k	19
Fig 3.9: Breadboard	20
Fig 3.9.1: Wire Work Circuit (Image Courtesy Of Wikipedia User Wikinat)	21
Fig 3.10:DC Motor	21
Fig 3.11: Relay Shield	23
Fig 4.1: Software Flat Form	24
Fig 4.2: Code Compile	25
Fig4.3: Flow Chart	26
Fig 5.1: Comparator With Arduino Microcontroller	28
Fig5.2: Connection Of Arduino With Gsm	28
Fig5.3: Experiment Setup Of Automated Smart Dryness Checking System	29

LIST OF TABLES

NAME OF THE TABLE	PAGE NO.
Table 2.1:List of Component Used In Circuit	07
Reference	33
Appendix	34

ABBREVIATIONS

CPU	--	Central Processing Unit
SRC	--	Speech-recognition Circuit
APP	--	Application
RAM	--	Random Access Memory
ROM	--	Read Only Memory
DSP	--	Digital Signal Processor
CMOS	--	Complementary Metal Oxide Semiconductor
RPS	--	Regulated Power Supply
AC	--	Alternate Current
DC	--	Direct Current
USB	--	Universal Serial Bus
LED	--	Light Emitting Diode
LCD	--	Liquid Crystal Display
ALU	--	Athematic Logic Unit
IC	--	Integrated Circuit
ISP	--	In-System Programmable
UART	--	Universal Asynchronous Receiver and Transmitter
GND	--	Ground
TTL	--	Transistor Transistor Logic
RST	--	Reset
ALE	--	Address Latch Enable
PC	--	Program Counter
SFR	--	Special Function Registers
PAN	--	Personal Area Networks
GFSK	--	Gaussian frequency shift keying
SIG	--	Special Interest Group
ISM	--	Industrial, scientific and medical Band

EDR -- - Enhanced Data Rate
AMR -- Android meets robot

ACKNOWLEDGEMENT

Firstly we give thanks to almighty Allah from the bottom of our hearts. We would like to express our sincere gratitude to our honorable supervisor, Assistant Professor Mr. .Md Mhamudur Rahman, Department of Electrical and Electronic Engineering, DIU who inspired us in every moment. We are thankful to him for his continuous encouragement, kind co-operation, and scholastic guidance all along the project work. He has always been extremely generous with his time, knowledge and ideas and allowed us great freedom in this research. We also want to convey our thankfulness to Prof. Dr. Md Shamsul Alam Head, Department of Electrical and Electronic Engineering for his help, support and constant encouragement. We express our humble gratitude to all teachers of Department of Electrical and Electronic Engineering for their support in numerous ways throughout this project work. We are also grateful to the authors whose valuable research papers and books we have considered as reference in this project paper. Apart from that, we would like to thank our entire friends for sharing knowledge; information and helping us in making this project a success. Also thanks for lending us some tools and equipment. Finally we would like to thank our parents who have given us tremendous inspirations and supports. Without their mental and financial supports, we would not able to complete our project.

ABSTRACT

Last ten years have seen a speedy evolution during this technology. Within the world, in progress analysis in exactness agriculture has been effectively applied to giant agribusinesses at scale. However little farmers don't have the capital resources to take a position in high-ticket watching systems. Thus to deal with these problems, we've got designed AN Arduino based mostly agriculture watching system that operates on GSM network. This method can monitor the wetness levels and close temperature and management the water flow consequently. The controller activates the relay driver unit once the message is received through GSM and pumps motor by victimization relay switches. This style are often used for dreaded the user via SMS (Short message service) if the wetness level and temperature goes on the far side the edge worth.

CHAPTER 1

INTRODUCTION

1.1 Introduction

In Bangladesh, farming assumes an imperative job in our everyday life and the future Bangladesh relies upon our agribusiness. Farming, storm condition based on the dirt quality, the products develop and the plants should be enough plant to plant The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

1.2 Problem Statement

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

1.3 Objective

Arduino is an open-source hardware electronics platform for building interactive projects. The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins, 6 analog inputs, a 16MHz crystal oscillator, a USB connection, a power jack that works with 5 volt, an ICSP header, and a reset button. gsm module is an easy to use (Serial Port Protocol module), designed for transparent wireless serial connection setup. The Module can be used DATA mode and command mode.

1.4 Aim of the Project

This projects is to help the farmers who are in remote areas where there might be no cellular network availability to switch on and off the Pump remotely without going near pump using

automated sensor .and gsm use to inform customer when motor off and off Previously farmer has to go to farm in order to switch on or off the pump which was difficult because of difficult terrain and weather conditions or during night time visit to pump may be wild animals out there or frequent power cut problems which eliminates frequently travelling to pump.

1.5 Future Scopes

The Automation can be implemented for switching ON/Off the pump using arduinouno in a Scheduled way and turn on Pump only if water is present in well. The project can be modified to be used with other device too. Project can be implemented with wifi in future or other technology so that it could be used greater distance. The Moisture sensor can be used so that we can detect the moisture in the soil.

1.6 Methodology

This undertaking will display the structure, development, advancement, control and assessment of a programmed exchanging speed electric engine, the answer for applications, fundamentally in rustic zones and for little scale agriculturists. Providing water to Agriculture fields assumes significant job in developing the great yields, the rancher needs to water the fields once in a while, and so as to switch on or the siphon he needs to go close to the field from time to time not even in ordinary climate conditions yet in addition in awful climate which we can dispose of by utilizing this cell phone, microcontroller work and Bluetooth innovation. Bluetooth is accessible in all cutting edge cell phone that works with the radio waves that A framework in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon remotely through the android telephone with Bluetooth which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and reasonable.

1.7 Organization of the Report

This project report has six chapters in total. The first chapter describes an idea about our project “smart dryness checking system””, Brief description of the project, problem statement, scopes and methodology. The second chapter about history, block diagram, circuit diagram, list of components. The chapter third about component description, cost analysis of our system. The chapter fourth software analysis & program explanation. The chapter five hardware implementation. Then chap six describes result & discussion properly. Finally, chapter six gives the concluding remarks, limitation of our system and suggestion for the future works.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This task is to help the agriculturists who are in remote regions where there may be no cell or internet accessibility to turn on and off the Pump remotely without going close to the siphon utilizing Bluetooth empowered Android Phone. Already the rancher needs to go to cultivate so as to turn on or off the siphon which was troublesome due to the troublesome landscape and climate conditions or amid evening time visit to the siphon might be wild creatures out there or visit control cut issues which wipe out the habitually heading out to the siphon.

2.2 General Block Diagram

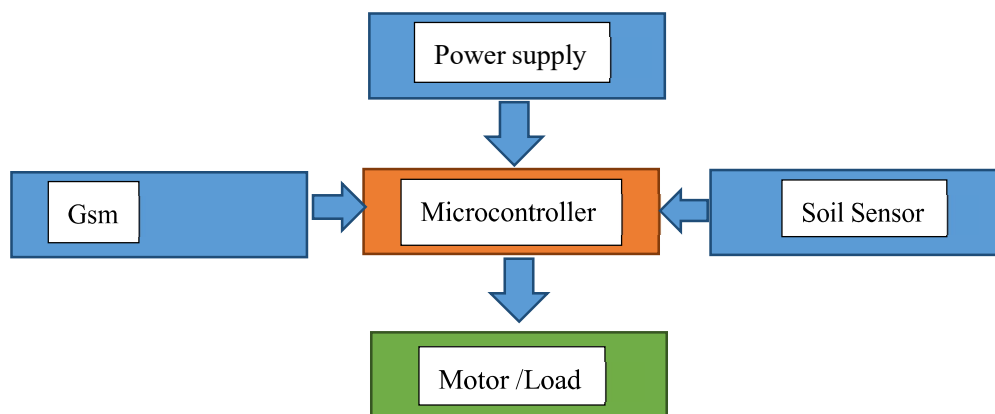


Figure 2.1: General block diagram

2.2.1 Block Diagram Description:

In this project, we have used some key components in our system. Firstly, we used a solar panel that supplies power for our circuit, and a 12V battery will consume power from the solar panel. Then we

used microcontroller arduinouno that controlled our whole system .android apps gsm ,soil sensor for soil and motor pump .whole process will be run two mode.

- 1) Automatic mode
- 2) Generalel mode

2.3 Circuit Diagram:

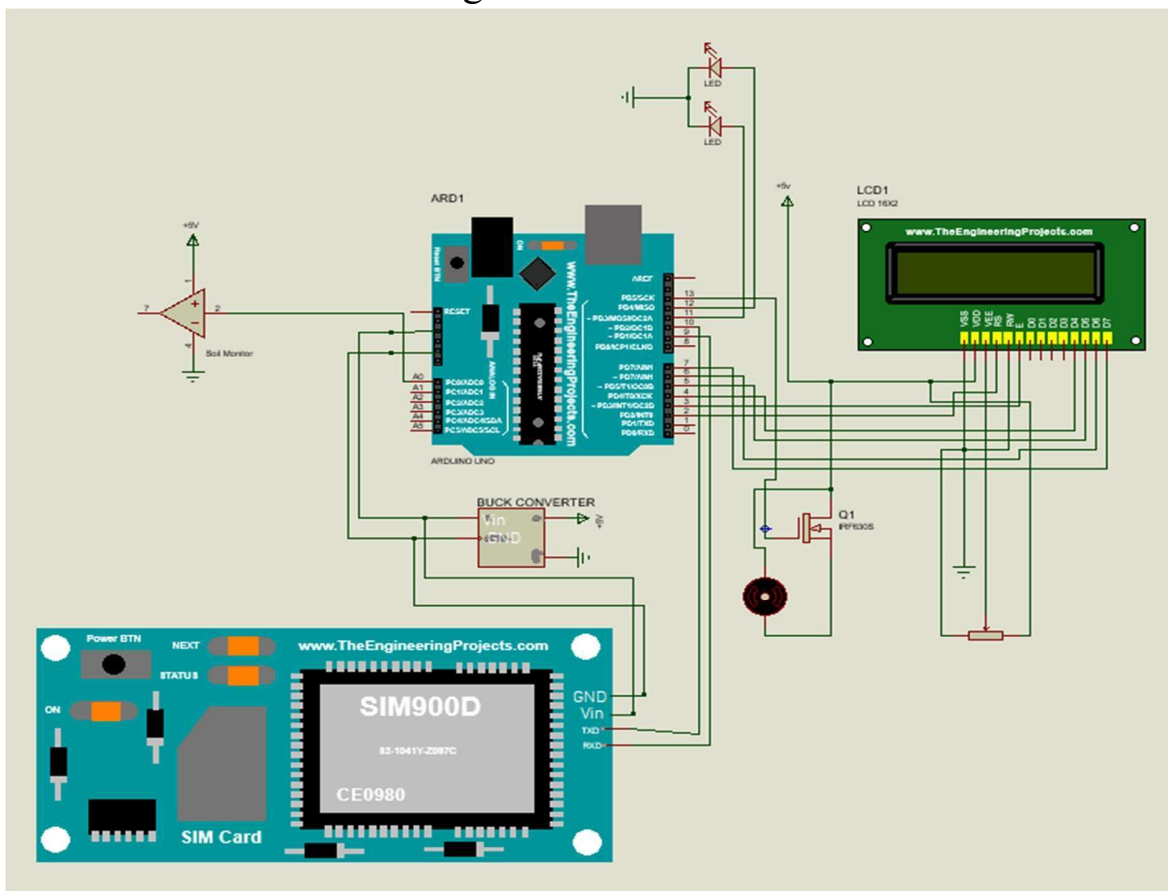


Figure 2.2: Two connection diagram

2.3.1 Working Processor of Circuit:

The possibility of the undertaking is to actualize a programmed water system framework. Crafted by the circuit is as per the following. The dirt dampness sensor is embedded in the dirt. Contingent upon the nature of the sensor the dirt dampness sensor estimates the conductivity of the dirt. Wet soil will be more conductive than dry soil the dirt dampness sensor module has a comparator in title

voltage from the prongs and the predefined voltage are found and the yield of the comparator is high just when the dirt condition is dry. This yield from the dirt dampness sensor is given to the simple info stick (Pin 2 - RA0) of the microcontroller. The microcontroller constantly screens the simple info stick. At the point when the dampness in the dirt is over the edge, the microcontroller shows a message and the engine is off. At the point when the yield from the dirt dampness sensor is high i.e. the dirt this will trigger the microcontroller and presentations a fitting message on the LCD and the yield of the microcontroller, which is associated with the base of the transistor is high. At the point when the transistor is turned on, the hand-off loop gets invigorated and turns on the engine. The LED is likewise turned on and fills in as a marker. At the point when the dirt achieves the edge esteem, the yield of the dirt dampness sensor is low and the engine is killed. The framework is additionally intended to caution when the dampness is high than the edge and the dirt is excessively wet, which is perilous for the plant. At the point when engine on gsm send to SMS client cell phone. This ventures is to help the agriculturists who are in remote territories where there may be no cell arrange accessibility to turn on and off the Pump remotely without going close siphon utilizing Bluetooth empowered Android Phone. Beforehand agriculturist needs to go to cultivate so as to turn on or off the siphon which was troublesome in view of troublesome landscape and climate conditions or amid evening visit to siphon might be wild creatures out there or visit control cut issues which disposes of every now and again making a trip to siphon.

2.4 List of Components used in Circuit:

No	Component Name	Quantity	Used
01	Arduino Uno	01	Used for Controlling
02	Display (16x2).	01	Used for text show

03	Soil sensor	01	To sense soil dryness
04	Battery 12 Volt	01	To energy supply
06	Motor	01	To pumping
07	Buck Converter	01	To control voltage
08	Led	02	To know level of sensor
09	Gsm8001	02	To send sms
10	Arduino compiler	01	To compiling code
11	Relay shield	01	To Switching
12	Capacitor	01	To hold voltage
13	Jumper wire	---	To communication

Table 2.1: List of components used in circuit

CHAPTER 3

COMPONENTS DESCRIPTION

3.1 Introduction

Arduino is an open-source hardware electronics platform for building interactive projects. The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins, 6 analog inputs, a 16MHz crystal oscillator, a USB connection, a power jack that works with 5 volt, an ICSP header, and a reset button.

3.2 Arduino Nano

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

3.2.1 General Pin functions:

Driven: There is a worked in LED driven by advanced stick 13. At the point when the stick is HIGH esteem, the LED is on, when the stick is LOW, it's off.

VIN: The info voltage to the Arduino/Genuino board when it's utilizing an outside power source (instead of 5 volts from the USB association or other directed power source). You can supply voltage through this stick, or, if providing voltage by means of the power jack, get to it through this stick.

5V: This stick yields a directed 5V from the controller on the board. The board can be provided with power either from the DC control jack (7 - 20V), the USB connector (5V), or the VIN stick of the board (7-20V). Providing voltage by means of the 5V or 3.3V pins sidesteps the controller, and can harm the board.

3V3: A 3.3 volt supply created by the on-board controller. Most extreme current draw is 50 mA.

GND: Ground pins.

IOREF: This stick on the Arduino/Genuino board furnishes the voltage reference with which the microcontroller works. A legitimately arranged shield can peruse the IOREF stick voltage and select the suitable power source or empower voltage interpreters on the yields to work with the 5V or 3.3V.

Reset: Typically used to add a reset catch to shields which obstruct the one on the board.

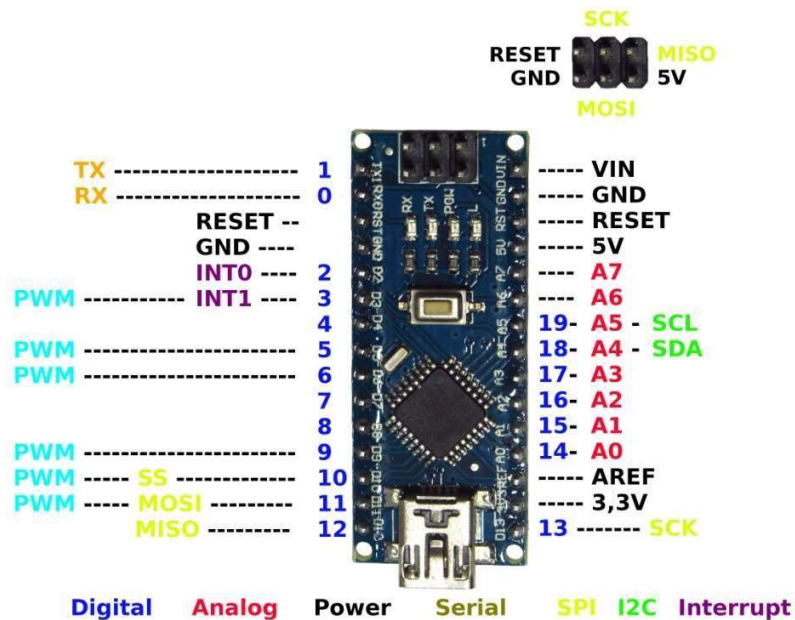


Fig 3.1: Arduino Nano.

3.3 Display (16x2)

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate

conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.



Fig 3.2: LCD Display.

3.4 Soil Sensor

The dirt dampness sensor is utilized to quantify the volumetric water substance of soil. It is utilized to screen soil dampness substance to control water system in nursery. A dampness sensor is utilized to detect the dimension of dampness content present in water system field. It has a dimension discovery module in which we can set a reference esteem.

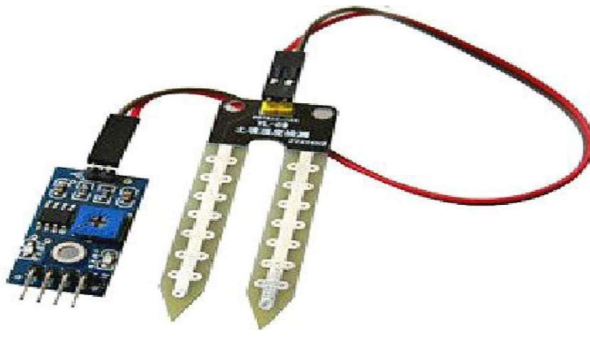


Fig: 3.3 Soil moisture Sensor

Applications and even the most requesting ones. The item is 4-stick single column stick bundle. Advantageous association, exceptional bundles can be given by clients require.

3.6 Battery Adapter 9v Volt:

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.



Fig 3.4: Adapter (9-volt).

3.7 GSM 800L

The SIM800L module underpins quad-band GSM/GPRS organize, accessible for GPRS and SMS message information remote transmission. The SIM800L speaks with microcontroller through UART port, bolsters order including 3GPP TS 27.007, 27.005 and SIMCOM improved AT Commands. It likewise has worked in level interpretation, so it can work with microcontroller of higher voltage than 2.8V default. Additionally, the board likewise bolsters A-GPS strategy which are called versatile situating and

gets position by portable system.



Figure 3.5: Gsm 8001

Features:

- Quad-band 850/900/1800/1900MHz
- GPRS multi-slot class12 connectivity: max. 85.6kbps(down-load/up-load)
- GPRS mobile station class B
- Controlled by AT Command (3GPP TS 27.007, 27.005 and SIMCOM enhanced AT Commands)
- Supports Real Time Clock
- Supply voltage range 3.4V ~ 4.4V
- Supports A-GPS
- Supports 3.0V to 5.0V logic level
- Low power consumption, 1mA in sleep mode
- Compact size 23mm x 35mm x 5.6mm
- Micro SIM Card

3.8 Buck Converter

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.



Fig 3.6: buck converter.

3.9 Jumper wire

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate

conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

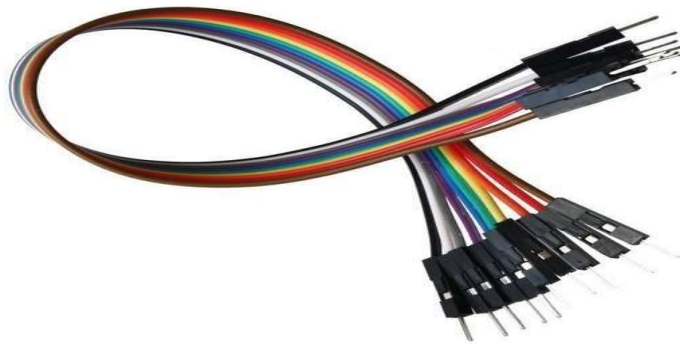


Fig 3.7: Jumper Wires.

3.10 Electro light capacitor 100uf& 10uf:

An electrolytic capacitor (e-top) is an energized capacitor whose anode or positive plate is made of a metal that frames a protecting oxide layer through iodization. This oxide layer goes about as the dielectric of the capacitor. A strong, fluid, or gel electrolyte covers the surface of this oxide layer, filling in as the (cathode) or negative plate of the capacitor. Because of their thin dielectric oxide layer and expanded anode surface, electrolytic capacitors have an a lot higher capacitance-voltage (CV) item per unit volume contrasted with clay capacitors or film capacitors, thus can have substantial capacitance esteems. There are three groups of electrolytic capacitor: aluminum electrolytic capacitors, tantalum electrolytic capacitors, and niobium electrolytic capacitors. The vast capacitance of electrolytic capacitors makes them especially reasonable for passing or bypassing low-recurrence signals, and for putting away a lot of vitality. They are broadly utilized for

decoupling or clamor sifting in power supplies and DC interface circuits for variable-recurrence drives, for coupling signals between speaker arranges, and putting away vitality as instantly light. Electrolytic capacitors are spellbound parts because of their unbalanced development, and must be worked with a higher voltage (i.e., increasingly positive) on the anode than on the cathode consistently. Thus the anode terminal is set apart with an or more sign and the cathode with a less sign. Applying a turn around extremity voltage, or a voltage surpassing the most extreme appraised working voltage of as meager as 1 or 1.5 volts, can annihilate the dielectric and consequently the capacitor.

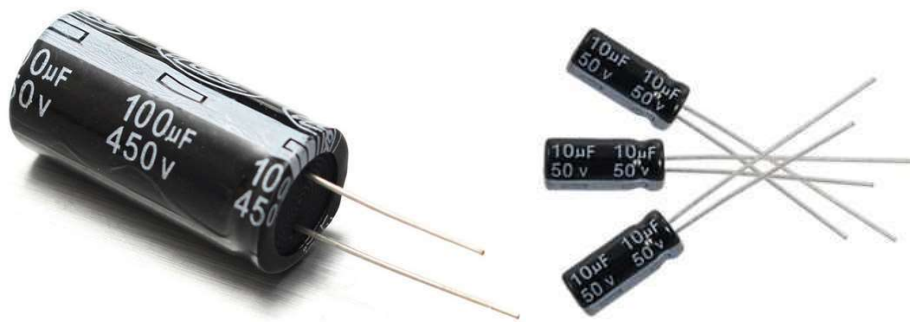


Fig 3.8: Electro light capacitor 100uf& 10uf.

3.11 Potentiometer 10k:

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.



Fig 3.9: Potentiometer 10k.

3.12 Breadboard

Breadboards are a standout amongst the most essential pieces when figuring out how to manufacture circuits. In this instructional exercise, you will take shortly about what breadboards are, the reason they are called breadboards, and how to utilize one. When you are done you ought to have a fundamental comprehension of how breadboards function and have the capacity to assemble an essential circuit on a breadboard

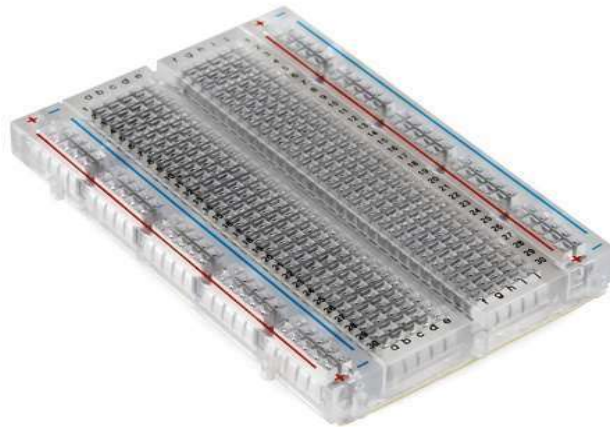


Fig 3.10: breadboard

Suggested Reading

Here are some tutorials and concepts you may want to explore before learning about breadboards:

- V,C,R, and Ohm's Law
- What are a circuit
- Working with wire
- Reading Schematics
- Common Connectors
- How to Use a millimeter

History

Breadboards are a standout amongst the most principal pieces when figuring out how to manufacture circuits. In this instructional exercise, you will take shortly

about what breadboards are, the reason they are called breadboards, and how to utilize one. When you are done you ought to have an essential comprehension of how breadboards function and have the capacity to manufacture a fundamental circuit on a breadboard.

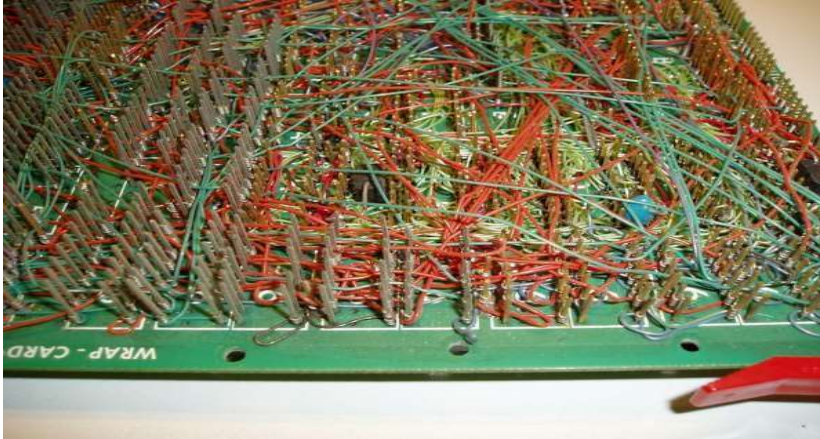


Figure 3.11: A wire-wrap circuit (image courtesy of Wikipedia user Wikinaut)

3.13 DC motor

A DC motor is designed to run on DC electric power. The Most Common DC Motors are the brushed and brushless types which use internal and externally. Brushless DC motors are commonly used where precise speed control is necessary.



Fig 3.12: DC Motor

3.14 Relay Shield:

A transfer is an electrically worked switch. Many transfers utilize an electromagnet to mechanically work a switch, however other working standards are likewise utilized, for example, solidstate transfers. Transfers are utilized where it is important to control a circuit by a different lowpower flag, or where a few circuits must be controlled by one flag. The first transfers were utilized in long separation broadcast circuits as enhancers: they rehashed the flag rolling in from one circuit and re-transmitted it on another circuit. Transfers were utilized widely in phone trades and early PCs to perform coherent activities. A kind of transfer that can deal with the high power required to specifically control an electric engine or different burdens is known as a contactor. Strong state transfers control circuits with no moving parts, rather utilizing a semiconductor gadget to perform exchanging. Transfers with aligned working attributes and some of the time different working loops are utilized to shield electrical circuits from over-burden or blames; in present day electric power frameworks these capacities are performed by advanced instruments still called "defensive transfers". Attractive hooking transfers require one beat of curl capacity to move their contacts in a single heading, and another, diverted heartbeat to move them back. Rehashed beats from a similar info have no impact. Attractive hooking transfers are valuable in applications where interfered with power ought not have the capacity to change the contacts. Attractive locking transfers can have either single or double loops. On a solitary curl gadget, the hand-off will work one way when control is connected with one extremity, and will reset when the extremity is turned around. On a double curl gadget, when energized voltage is connected to the reset loop the contacts will progress. Air conditioning controlled attractive hook transfers have single loops that utilize directing diodes to separate among work and reset directions.

3.11.1 Features:

- Arudino Uno/Leonardo/Seeeduino compatible; Other board or microcontroller via jumper cables
- Interface via digital I/O pins 4,5,6, and 7
- Relay screw terminals
- Standardized shield shape and design
- LED working status indicators for each relay
- High quality relays
- COM, NO (Normally Open), and NC (Normally Closed) relay pins for each relay Update pin SCL, SDA, IOREF, NC.



Fig 3.13: Relay Shield.

CHAPTER 4

SOFTWARE ANALYSIS

4.1. Introduction

In this chapter the software used and the language in which the program code is defined is mentioned and the program code dumping tools are explained. The chapter also documents the development of the program for the application.

4.2 Description of our Software

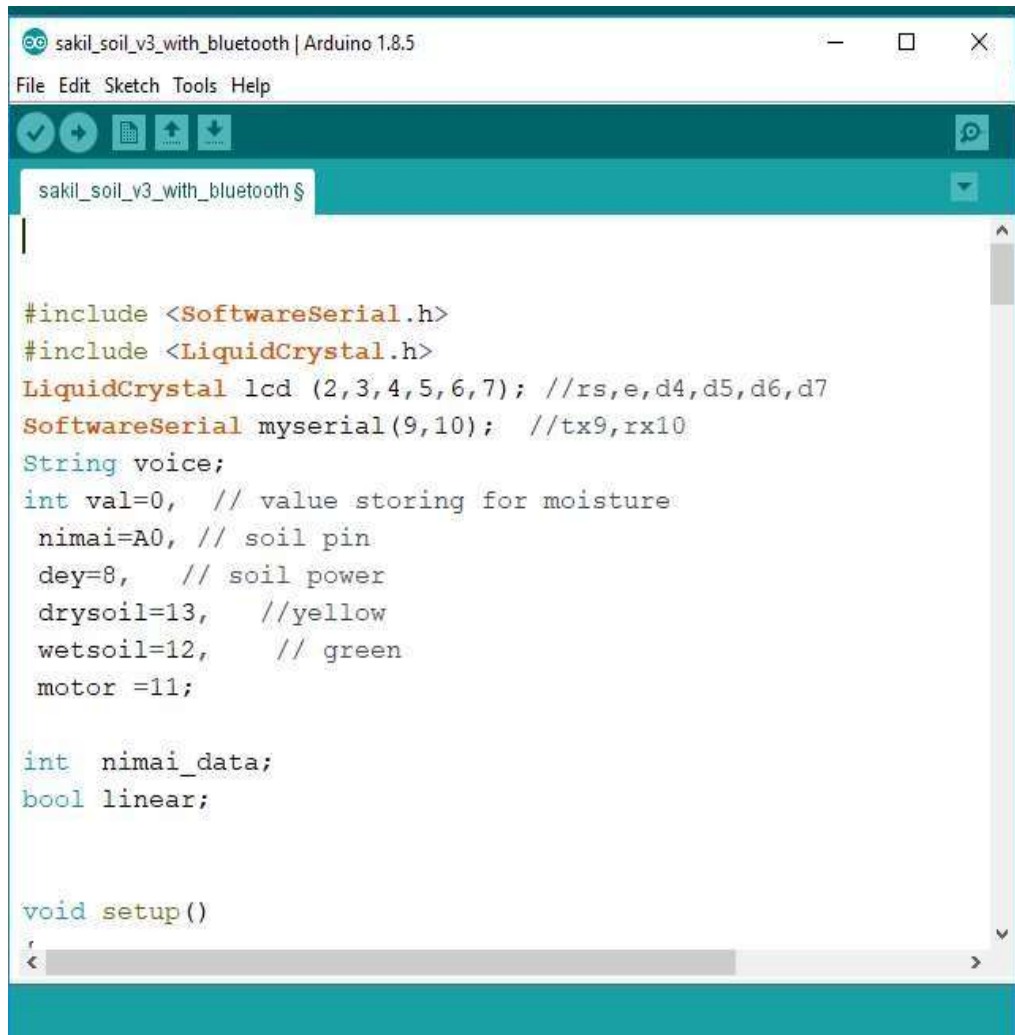
The open-source Arduino environment makes it easy to write code and upload it to the I/O board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing, avr-gcc, and other open source software. The screen shot of Arduino 1.6.8 is shown below...



Fig. 4.1: Software Platform

It is also capable of compiling and uploading programs to the board with a single click. There is typically no need to edit files or run programs on a command-line interface. Although building on command-line is possible if required with some third-party tools such as Ion. The Arduino IDE comes with a C/C++ library called "Wiring" (from the project of the same name), which makes many common input/output operations much easier. Arduino programs are written in C/C++, although users only need define two functions to make a runnable program:

4.3 The compiled window of my code is shown below.



```
sakil_soil_v3_with_bluetooth | Arduino 1.8.5
File Edit Sketch Tools Help
sakil_soil_v3_with_bluetooth $

#include <SoftwareSerial.h>
#include <LiquidCrystal.h>
LiquidCrystal lcd (2,3,4,5,6,7); //rs,e,d4,d5,d6,d7
SoftwareSerial myserial(9,10); //tx9,rx10
String voice;
int val=0, // value storing for moisture
  nimai=A0, // soil pin
  dey=8, // soil power
  drysoil=13, //yellow
  wetsoil=12, // green
  motor =11;

int  nimai_data;
bool linear;

void setup()
{
```

Fig 4.2: Code compile.

4.4 Flow Chart for our system:

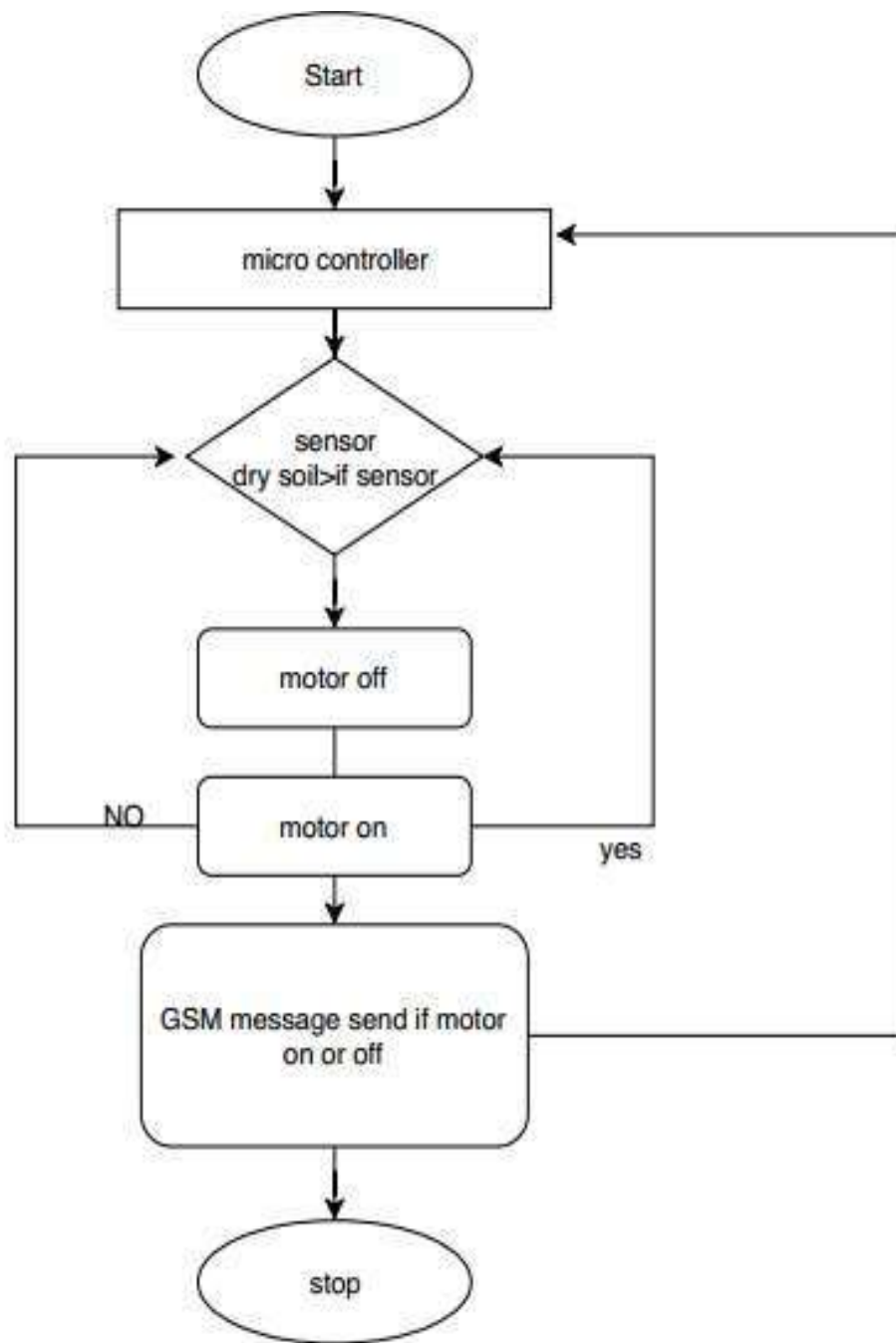


Fig: 4.3: Flow Chart of System

CHAPTER 5

RESULT AND DISCUSSION

5.1: Introduction:

We have manufactured a framework for robotization of 3 stage Agriculture siphon with Arduino no lodging Bluetooth module HC-05 and misdate, and soil sensor and we wired up every one of the segments then we utilized arduino IDE we built up an application for android telephone over jellybean OS utilizing the Android studio that can associate with Bluetooth gadget and send message and get messages, In the UI part we have 3 catches approached, OFF and CHECK individually to turn siphon on, off and check the siphon is on or off. The beneath demonstrates the association setup of the framework.

5.2: Interfacing LM393 (soil sensor) Comparator with Arduino Microcontroller

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here

is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

to discover whether the land needs water or not. The dimension of water system.

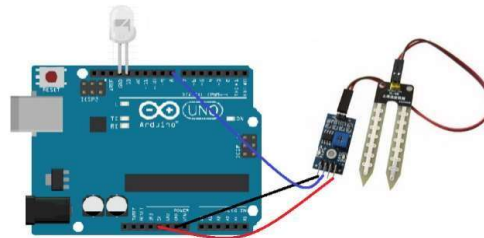


Figure 5.1: Comparator with Arduino Microcontroller

5.3 Connection of Arduino with GSM module

GSM module\ is associated with the computerized stick of Arduino board as appeared in figure 2. The GSM module is associated with the outside (buck converter) 4.92V power supply. Through the GSM module the message can be sent for a long separation and the Subscriber

Identity Module (SIM) ought to be embedded in the GSM Module

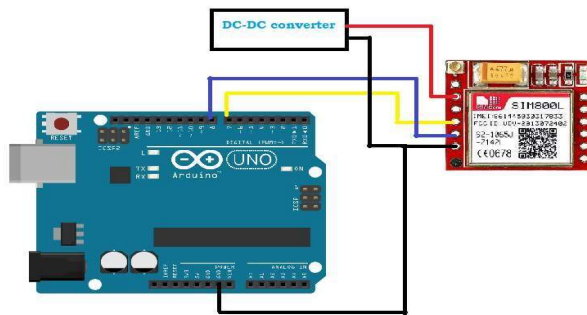


Figure 5.2: Connection of Arduino with GSM module

On the off chance that the required water level is achieved, the LED flickers and alarms the agriculturist by tossing messages utilizing GSM innovation. The 2 sticks in the focal point of GSM board are utilized for associating speakers and different gadgets. There are 3 pins utilized for information transmission, in that first stick is associated with the ground, second stick of GSM module Tx is associated with the Rx in the Arduino, third stick of GSM module Rx is associated with the Tx of Arduino

5.4 Operation of the system

A soil wetness sensing element is employed to collect information about wetness of the land. This system consists of an ArduinoATmega328 microcontroller that receives a logical signal 0 (or) 1 and pulls the motor driver to its state. Several of the microcontroller is used for managing the sensor. (projects er sobi akan a)

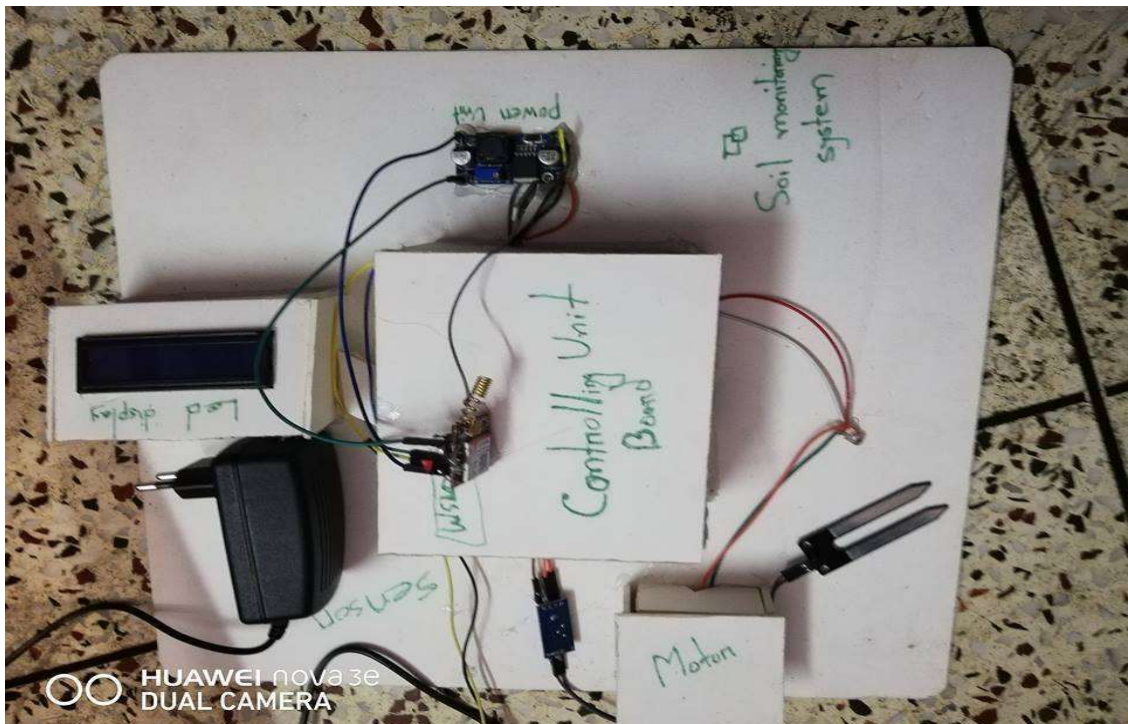


Fig. 5.3: Experimental setup of automated smart dryness checking System.

The prototype model of experimental setup of irrigation is shown in figure 3. Arduino board is often powered by either a USB or via external battery. "In Circuit-serial Programming" facility allows uploading of software in the microcontroller without opening the code.

5.5 Result:

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of

system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

The answer for applications, for the most part in country regions and for little scale agriculturists. Providing water to Agriculture fields assumes real job in developing the great harvests, the rancher needs to water the fields from time to time, and so as to switch on or the siphon he needs to go close to the field every so often not even in typical climate conditions yet additionally in terrible climate which we can take out by utilizing this cell phone, microcontroller and gsm innovation. System is accessible in all cutting edge cell phone that works with the radio waves that works in littler inclusion territory and no need of system availability like web or cell arrange. This paper is proposed to control the water system siphon

remotely through the dirt sensor with air conditioning power which can be utilized to control the siphon by means of the arduino uno microcontroller utilizing transfers to control the turning on or off siphon and checking whether siphon is either on or off utilizing sensors. The parts utilized here is exceptionally practical and moderate.

CHAPTER 6

CONCLUSION

6.1 Introduction:

The completion of this project has led to several conclusions to be made about this solar and smart dryness checking system. From the concept of solar tracking system, this is well suited to utilize more energy than a fixed solar panel. We have tried to make a simple and low cost gsm based soil dryness checking system. Modification of the same system can be used for big application. Such as we have used rectangular frame for simplicity, but using flat plate with soldering a U shape frame we can use the same system for street light. However, the system was not easy to make. We faced several problems and failed in different times. We used full rotation servos first, later exchanged with half rotation servos to meet actual purpose and at last we have complete the auto irrigation &gsm base messaging system. The project work can be more improved with a few adjustments in the design and development. The capacity of tracking and life time can be increased using more powerful motors though it will be a little bit expensive. But using microcontrollers in the place of control circuit can make it cheaper though it will be complex. In future, it can further enhanced by controlling the auto system.

6.2 Advantages:

1. Trenching too lay new wire, repairing old wire, or replacing stolen copper wire can be extremely expensive.
2. Our Wireless Switch Systems simply replaces the control wire that would normally connect your float switch or pressure switch to your pump starter, eliminating the need too trench or purchase large amounts of expensive wire.
3. GSM (Global System for mobile communication) notification system

4. Dryness and wet soil monitoring very easy

6.3 Disadvantages & limitations:

1. it's a slow and short length process
2. It doesn't read the system value with rainy season
3. When the sensor put out from the soil it automated show dry soil value.
5. When gsm module unable to get network, the module cannot send sms properly.

6.4 Future Scope:

We can provide more facility's in our smart system example:

- Automatic control by a smart phone
- We will also provide smart switching from web side
- Every season we can collect data from nature and help to our government.
- We also can provide a power and distribute power grid.
- After we can use irrigation purpose .

References

- [1]. Kay, M., “Smallholder irrigation technology: Prospects for sub-Saharan Africa” International Program for Technology and Research in Irrigation and Drainage, FAO, Rome, 2001, pp. 1–25.
- [2]. N. Shah and I. Das, “Precision Irrigation Sensor Network Based Irrigation”, a book on Problems, Perspectives and Challenges of Agricultural Water Management, IIT Bombay, India, pp. 217–232, April 2008
- [3]. Fangmeier, D. D., Garrot, D. J., Mancino, C.F and Husman, S. H., “Automated irrigation systems using plant and soil sensors”, American Society of Agricultural Engineers, ASAE Publication, 1990, pp. 533-537.
- [4]. Benzekri, A., Meghriche, K., and Refoufi, L., PC-based automation of a multi-mode control for an irrigation system Proceedings of International symposium on industrial embedded systems, Lisbon, July 2007, pp. 310-315.
- [5]. Shinghal, K., Noor, A., Srivastava, N., and Singh, R., Wireless sensor networks in agriculture for potato farming International Journal of Engineering, Science and Technology, Vol. 2, No. 8, 2010, pp. 3955-3963.
- [6]. [56Gautam, I., and Reddy, S. R. N., Innovative GSM-Bluetooth based remote controlled embedded system for irrigation, International Journal of Computer Applications, Vol. 47, No. 8, 2012, pp. 1.
- [7]. Zhang, F., Yang, M., and Ying, H., The application of GSM communication in agricultural automation, Journal of Technology for Agriculture, Vol. 1, No. 1, 2004, pp. 39-41.
- [8]. Shen Jin, Song Jingling, Han Qiuyan, Wang Shengde, and Yang Yan, School of Electric and Electronic Engineering, A Remote Measurement and Control System for Greenhouse Based on GSM-SMS, IEEE 8th International Conference on Electronic Measurement and Instrument, 2007, pp. 45-82
- [9]. Webin Huang, Guanglong Wang, Research of Wireless Sensor Networks for an Intelligent Measurement System Based on ARM, pp.1074-1079, 2011.
- [10]. Sezen SM, Yazar A, Irrigation Management on Yield And Quality Of Tomatoes Grown in different Soilless Media in Glasshouse, 41-48, 2010.
- [11]. Daniel K.Fisher and HirutKebede, a Low Cost Microcontroller-Based System to Monitor Crop Temperature and Water Status, pp. 168-173, 2010.

Appendix A

```
#include <SoftwareSerial.h>
#include <LiquidCrystal.h>
LiquidCrystal lcd(4,5,6,7,8,9); //rs,e,d4,d5,d6,d7
SoftwareSerial myserial(2,3); //tx9,rx10 String voice; int val=0, //
value storing for moisture nimai=A0, // soil pin dey=10, // soil
power drysoil=13, //yellow wetsoil=12, // green motor =11;
int nimai_data; bool linear; void setup() { myserial.begin(9600);
// Setting the baud rate of GSM Module Serial.begin(9600);
delay(100); pinMode(nimai,INPUT);
pinMode(dey,OUTPUT); //D7 digitalWrite(dey,HIGH); //D7
LOW pinMode(drysoil,OUTPUT); //led for drysoil
pinMode(wetsoil,OUTPUT); // led for wetsoil
pinMode(motor,OUTPUT); //motor

//myserial.begin(9600);
// lcd.setCursor(16, 2);
lcd.begin(16,2);
lcd.setCursor(0,0);
lcd.print("DIU");
delay(3000); lcd.setCursor(0,
1); lcd.print("EEE-Batch-");
delay(2000); lcd.clear();
lcd.setCursor(0,0);
lcd.print("Smart");
delay(3000); lcd.setCursor(0,
1); lcd.print("Soil dryness");
delay(2000); lcd.clear();
lcd.setCursor(0,0);
```

```
lcd.print("checking System");
delay(1500); } void loop()
{ linear = false; nimai1();
if (myserial.available()>0)
while (linear == true)
{
nsms(); break;
Serial.println(
"system
message");

} if
(myserial.available())
Serial.write(myserial.read());
}
void nimai1() { pinMode(nimai,INPUT);
pinMode(dey,OUTPUT);//D7
digitalWrite(dey,HIGH);//D7          LOW
pinMode(drysoil,OUTPUT); //led for drysoil
pinMode(wetsoil,OUTPUT); // led for wetsoil
pinMode(motor,OUTPUT);          //motor
nimai_data = analogRead(nimai);
Serial.println("          "); Serial.print(nimai_data); if (
nimai_data>500 ){ lcd.clear(); lcd.setCursor(0,0);
lcd.print(" Motor ON"); lcd.setCursor(1,8); lcd.print("
Drysoil"); delay(100); digitalWrite(wetsoil,0); // led
blink when the soil is wet digitalWrite(drysoil,1);
digitalWrite(motor,1); // motor ON delay(1000); //linear
=true; nsms(); delay(10000);
digitalWrite(motor,1); // motor ON
```



```

    } else if
(nimai_data>10 )
{ lcd.clear(); lcd.setCursor(0,0); lcd.print(" Motor
Off"); lcd.setCursor(1,8); lcd.print("Wetsoil");
digitalWrite(wetsoil,1); digitalWrite(drysoil,0); // led
blink when the soil is dry digitalWrite(motor,0); //
motor OFF delay(2000);
} } intreadsoil() { digitalWrite(dey,1); //d7 on
delay(100); val=analogRead(nimai); // signal
read of soil pin digitalWrite(dey,0); // off d7
returnval; } voidnsms()
{
Serial.println("SMS loop entering"); //lcd.print(" sms loop entering ");
myserial.println("AT+CMGF=1"); //Sets the GSM Module in Text Mode
delay(1000); // Delay of 1000 milli seconds or 1 second
myserial.println("AT+CMGS=\"+017XXXXXXXXXXXXX\"r"); // Replace x
with mobile number delay(1000); myserial.println("Motor on this
process");// The SMS text you want to send delay(100);
//lcd.print("SMS Sending");
myserial.println((char)26);// ASCII code of CTRL+Z
delay(1000);
} voiddt()
{
Serial.println("SMS loop entering"); //lcd.print(" sms loop entering ");
myserial.println("AT+CMGF=1"); //Sets the GSM Module in Text Mode delay(1000); //
Delay of 1000 milli seconds or 1 second
myserial.println("AT+CMGS=\"+017XXXXXXXX\"r"); // Replace x with mobile number
delay(1000); myserial.println("Motor off now");// The SMS text you want to send
delay(100);

```

```
//lcd.print("SMS Sending");  
myserial.println((char)26);// ASCII code of CTRL+Z  
delay(1000);  
}
```