COLD FRAME PLANT MONITORING SYSTEM USING IOT

APROJECTREPORT

Submitted by

SOUNDHAR.M	**Reg. No.: 13BEC145**
VENKATRAAMAN.J.S	**Reg. No.: 13BEC163**
BHARANITHARAN.J	**Reg. No.: 13BEC214**
SHATHISH WARMA.S	**Reg. No.: 13BEC234**

in partial fulfillmentfortheawardofthedegree

of

BACHELOR OF ENGINEERING

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

KUMARAGURU COLLEGE OF TECHNOLOGY

COIMBATORE - 641 049

(An Autonomous Institution Affiliated to Anna University, Chennai)

ANNA UNIVERSITY: CHENNAI

APRIL 2017

BONAFIDE CERTIFICATE

Certified that this project reporttitled **"COLD FRAME PLANT MONITORING SYSTEM USING IOT"** is the bonafide work of **"SOUNDHAR.M (13BEC145),VENKATRAAMAN.J.S (13BEC163),BHARANITHARAN.J (13BEC214), and SHATHISHWARMA.S (13BEC234)"** who carried out the project work under my supervision. Certified further that lead to the best of my knowledge the work reported herein doesn't part of any other project or dissertation on the basis of which a degree or award was conferred on a earlier occasion on this or any other candidate.

SIGNATURE **SIGNATURE**

Mr. R. KARTHI KUMAR M.E., **Dr. K.MALARVIZHI M.E Ph. D.,**

PROJECT SUPERVISOR **HEAD OF THE DEPARTMENT**

Department of ECE Department of ECE

Kumaraguru College of Technology Kumaraguru College of Technology

Coimbatore. Coimbatore.

The candidates with Register numbers **13BEC145, 13BEC163, 13BEC214, 13BEC234**, are examined by us in the project viva-voce examination held on **21/4/17**

INTERNAL EXAMINER **EXTERNAL EXAMINER**

ACKNOWLEDGEMENT

First we would like to express our praise and gratitude to the Lord, who has showered his grace and blessing enabling us to complete this project in an excellent manner. He has made all things in beautiful in his time.

We express our sincere thanks to our beloved Joint Correspondent, **Shri. Shankar Vanavarayar** for his kind support and for providing necessary facilities to carry out the project work.

We would like to express our sincere thanks to our beloved Principal **Dr. R. S. Kumar M.E., Ph.D.,** who encouraged us with his valuable thoughts.

We would like to express our sincere thanks and deep sense of gratitude to our HOD, **Dr. K.Malarvizhi M.E Ph.D.,** for her valuable suggestions and encouragement which paved way for the successful completion of the project.

We are greatly privileged to express our deep sense of gratitude to the Project Coordinator **Dr. Ramalatha Marimuthu M.E Ph.D.**, Assistant Professor, for her continuous support throughout the course.

In particular ,We wish to thank and express our everlasting gratitude to the Supervisor. **Mr. R. Karthi kumar M.E.,** Assistant Professor for his expert counselling in each and every steps of project work and we wish to convey our deep sense of gratitude to all teaching and non-teaching staff members of ECE Department for their help and cooperation.

Finally, we thank our parents and our family members for giving us the moral support in all of our activities and our dear friends who helped us to endure our difficult times with their unfailing support and warm wishes.

ABSTRACT

There are many techniques available for the precision agriculture to monitor and control environment for the growth for many crops.Due to unequal distribution of rain water,it is very difficult to requirement needed by the farmer to manage the water equally to all crops in whole farm it requires some irrigation method that is suitable for any weather condition,soil types and variety of crops. Green House is the best solution to control and manage all this problem .it is most important to search a method that gives a perfect and controlling to develop a proper environment. Large areas are covered by a sensor network this can establish greenhouse with precision environment required for the different crops. The environment builds up by using two technologies IoT and cloud computing. By using IoT(Internet of THINGS)we control devices or any environmental needs anytime,anywhere and the cloud which provides storage and computing resources to implement a web page.

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LIST OF ABBREVATIONS

HTML	Hyper Text Markup Language
CSS	Cascading Style Sheet
PHP	Hypertext Pre processor
UI	User Interface
OS	Operating System
GPIO	General Purpose Input Output pins

CHAPTER 1

INTRODUCTION

The Internet of Things is a vision of a world in which most objects are connected, transmitting updates about their performance so the people who use them to do things more intelligently. This vision is being built today, with connected devices becoming more and more frequent in our daily lives. The basic concept behind the Internet of Things is that virtually every physical thing in this world can also become a computer that is connected to the Internet.

In this paper I will present an overview of the Internet of Things phenomena as well as its applications and agriculture. In the Internet era, where information plays a key role in people's lives, agriculture is quickly turning into a very data-intensive industry in which farmers must accumulate a huge amount of data in order to become more efficient in production and communicating appropriate information.

As the concept of the Internet of Things becomes increasingly prevalent, many systems are being devised to allow all manner of data to be gathered and analysed, and devices controlled via wireless data networks. The correct environmental conditions are imperative for successful plant growth, improved crop yields, and effective use of water and similar resources. I will also focus on the development of urban greenhouse monitoring systems, and present the current and future solutions, concepts and devices that are currently available on the market. Between efforts to eat more food grown locally, a younger generation of farmers and enthusiast have started to become reliant on an infusion of data and technology.

1.1GLOBAL SMART IRRIGATION MARKET

1.1.1 DRIVERS AND TRENDS

The global smart irrigation market features advanced systems that can be integrated with weather data systems to anticipate the amount of water required on a field over a particular period. This advantage of smart irrigation systems will aid the market's growth during the forecast period. The market can be broadly segmented on the basis of smart irrigation hardware, sensors, and network components.

It is expected that the valuation of the global smart irrigation market by hardware will surpass US $ 1Bn by the end of 2024. Much of the growth reported by the market will occur as a result of heightened awareness regarding water conservation. Moreover, the agricultural community worldwide is taking issues such as resource wastage and per-hectare productivity seriously. This has led to greater willingness among farmers to adopt technologies that can help them meet this end.

Demand for sensors is expected to remain the highest in the global smart irrigation market by hardware and components. The other reason for increasing sales of sensors for smart irrigation is that they help farmers identify the levels of various nutrients in the soil. Issues such as water logging can also be efficiently and swiftly identified with the use of sensors.

While the use of smart irrigation is seen in non-agricultural applications such as on golf courses, for landscaping and turf development, and in the residential sector, it is the agriculture application segment that will exhibit the highest demand for smart irrigation systems.

1.1.2 THE STUDY IS A SOURCE OF RELIABLE DATA ON

- Market segments and sub-segments
- Market trends and dynamics
- Supply and demand
- Market size
- Current trends/opportunities/challenges
- Competitive landscape
- Technological breakthroughs
- Value chain and stakeholder analysis

1.1.3 THE REGIONAL ANALYSIS COVERS

- North America (U.S. and Canada)
- Latin America (Mexico, Brazil, Peru, Chile, and others)
- Western Europe (Germany, U.K., France, Spain, Italy, Nordic countries, Belgium, Netherlands, Luxembourg)

1.1.4. HIGHLIGHTS OF THE REPORT

- A complete backdrop analysis, which includes an assessment of the parent market
- Important changes in market dynamics
- Market segmentation up to the second or third level
- Historical, current, and projected size of the market from the standpoint of both value and volume
- Reporting and evaluation of recent industry developments
- Market shares and strategies of key players
- Emerging niche segments and regional markets
- An objective assessment of the trajectory of the market

CHAPTER 2

BLOCK DIAGRAM AND DESCRIPTION

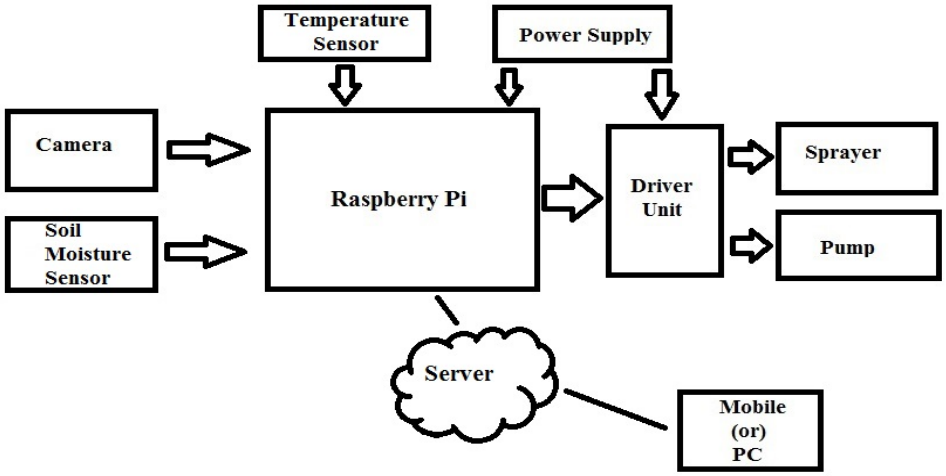


Fig 2.1Block Diagram Of Cold Frame Plant Monitoring System Using Iot

- The soil moisture sensor used will detect moisture content if it reaches the threshold value and send a signal to the raspberry pi microcontroller which in turn alerts the stepper motor to switch on/off and make it really easy.
- The camera is to monitor the crops and to detects the plant health.
- The temperature and humidity sensor is used to maintain the level of the fields and the value is fixed if it reaches it starts to spray the water.
- For the motor there is a driver unit to control by a raspberry pi LM293D for both sprayer and motor.
- And all readings are displayed on the web server and loaded to it is easy to control via IoT.

COMPONENTS AND ITS USES:

Components	Usage/Advantage
Raspberry pi	Performance for various real-time control applications using programs
Soil moisture sensor	To detect the moisture content in the soil
Humidity and temperature sensor	To measure the temperature and humidity
Water pump driven by DC motor	To irrigate the soil
LM293D Module	To drive the DC motor
Camera	Used for surveillance

fig 2.2Uses of Components

CHAPTER 3

HARDWARE DESCRIPTION

3.1 RASPBERRY PI

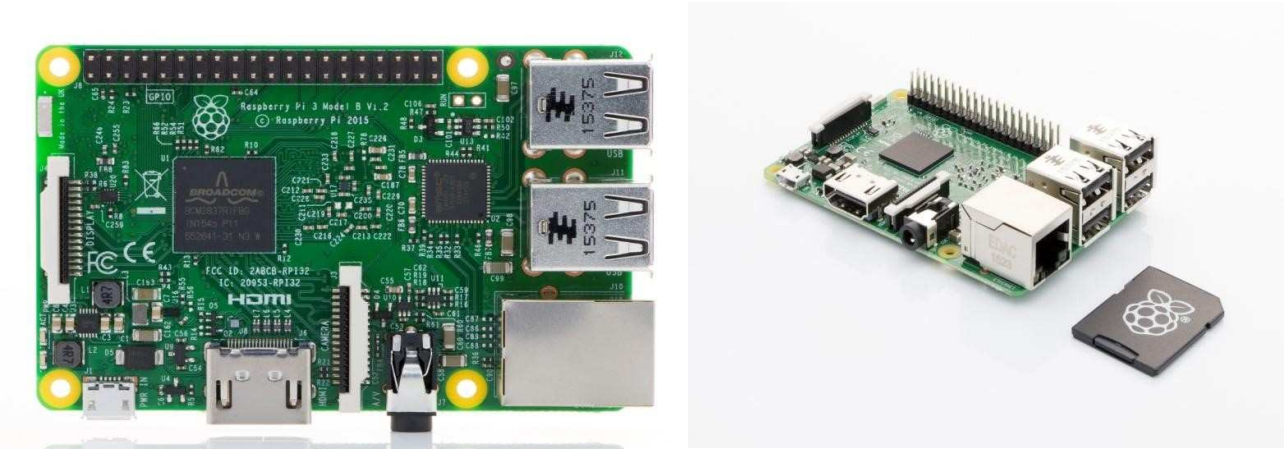


Fig3.1 Overview Of Raspberry Pi

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python.

It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games.

The picture of Raspberry pi board is shown. It has the ability to interact with the outside world, and has been used in a wide array of digital maker projects, from music machines and parent detectors to weather stations and tweeting birdhouses with infra-red cameras. We want to see the Raspberry Pi being used by kids all over the world to learn to program and understand how computers work.

The Raspberry Pi is a series of credit card–sized single-board computers developed in England, United Kingdom by the Raspberry Pi Foundation with the intent to promote the teaching of basic computer science in schools and developing countries.

The original Raspberry Pi and Raspberry Pi 2 are manufactured in several board configurations through licensed manufacturing agreements with Newark element14 (Premier Farnell), RS Components and Egoman. The hardware is the same across all manufacturers.

All models feature a Broadcom system on a chip (SOC) which include an ARM compatible CPU and an on chip graphics processing unit GPU (a VideoCore IV). CPU speed range from 700 MHz to 1.2 GHz for the Pi 3 and on board memory range from 256MB to 1GB RAM. Secure Digital SD cards are used to store the operating system and program memory in either the SDHC or MicroSDHC sizes.

Most boards have between 1 and 4 USB slots, HDMI and composite video output, and a 3.5mm phono jack for audio. Lower level output is provided by a number of GPIO pins which support common protocols like I2C. Some models have an RJ45 Ethernet port and the Pi 3 has on board WiFi 802.11n and Bluetooth.

3.1.1 GPIO PINS

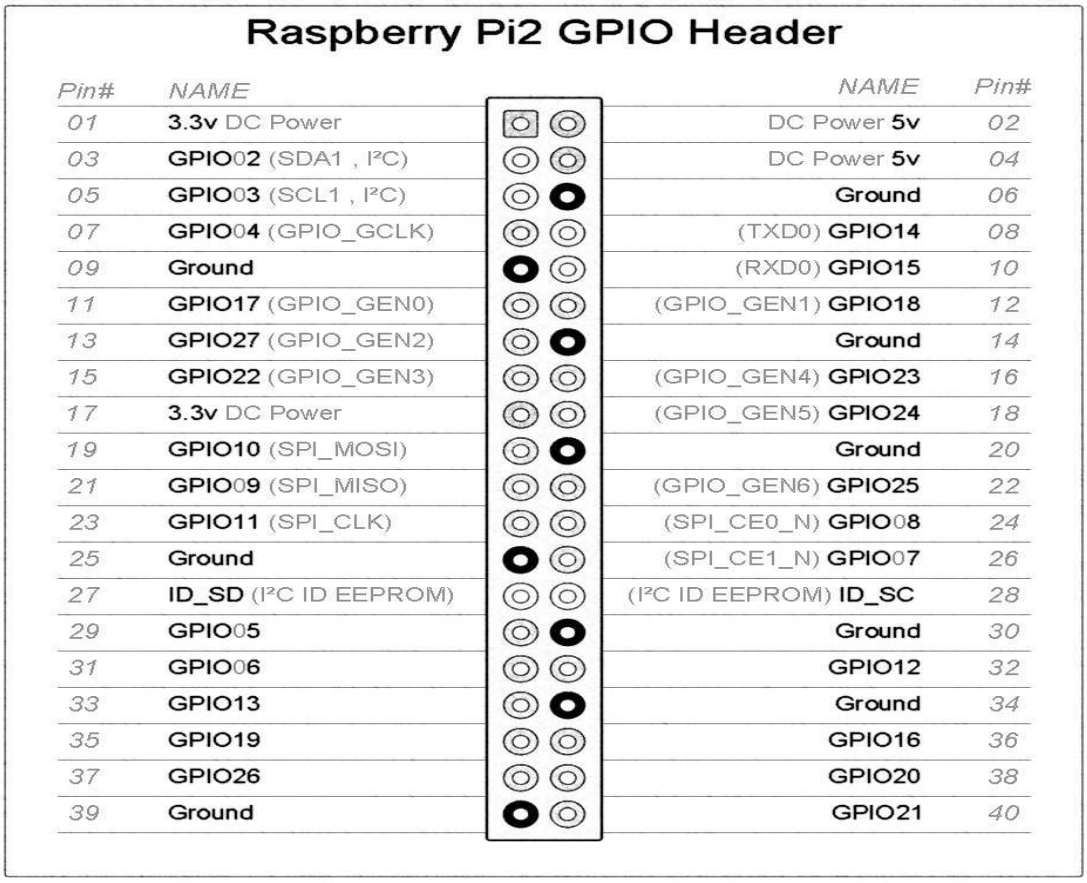


fig3.1.1 Pins of raspberry pi

GPIO pins can be configured as either general-purpose input, general-purpose output or as one of up to 6 special alternate settings, the functions of which are pin-dependant.

There are 3 GPIO banks on BCM2835. Each of the 3 banks has its own VDD input pin. On Raspberry Pi, all GPIO banks are supplied from 3.3V. Connection of a GPIO to a voltage higher than 3.3V will likely destroy the GPIO block within the SoC. A selection of pins from Bank 0 is available on the P1 header on Raspberry Pi.

- **GPIO PADS**

The GPIO connections on the BCM2835 package are sometimes referred to in the peripherals datasheet as "pads" - a semiconductor design term meaning "chip connection to outside world". The pads are configurable CMOS push-pull output drivers/input buffers.

Register-based control settings are available for

Internal pull-up / pull-down enable/disable

Output drive strength

Input Schmitt-trigger filtering

- **POWER-ON STATES**

All GPIOs revert to general-purpose inputs on power-on reset. The default pull states are also applied, which are detailed in the alternate function table in the ARM peripherals datasheet. Most GPIOs have a default pull applied.

- **INTERRUPTS**

Each GPIO pin, when configured as a general-purpose input, can be configured as an interrupt source to the ARM.

Several interrupt generation sources are configurable:

Level-sensitive (high/low)

Rising/falling edge

Asynchronous rising/falling edge

Level interrupts maintain the interrupt status until the level has been cleared by system software (e.g. by servicing the attached peripheral generating the interrupt).

The normal rising/falling edge detection has a small amount of synchronisation built into the detection. At the system clock frequency, the pin is sampled with the criteria for generation of an interrupt being a stable transition within a 3-cycle window, i.e. a record of "1 0 0" or "0 1 1". Asynchronous detection bypasses this synchronisation to enable the detection of very narrow events.

- **ALTERNATIVE FUNCTIONS**

Almost all of the GPIO pins have alternative functions. Peripheral blocks internal to BCM2835 can be selected to appear on one or more of a set of GPIO pins, for example the I2C busses can be configured to at least 3 separate locations. Pad control, such as drive strength or Schmitt filtering, still applies when the pin is configured as an alternate function.

3.1.2 POWER SUPPLY

The device is powered by a 5V micro USB supply. Exactly how much current (mA) the Raspberry Pi requires is dependent on what you connect to it. We have found that purchasing a 1.2A (1200mA) power supply from a reputable retailer will provide you with ample power to run your Raspberry Pi.

Typically, the model B uses between 700-1000mA depending on what peripherals are connected; the model A can use as little as 500mA with no peripherals attached. The maximum power the Raspberry Pi can use is 1 Amp. If you need to connect a USB device that will take the power requirements above 1 Amp, then you must connect it to an externally-powered USB hub.

The power requirements of the Raspberry Pi increase as you make use of the various interfaces on the Raspberry Pi. The GPIO pins can draw 50mA

safely, distributed across all the pins; an individual GPIO pin can only safely draw 16mA. The HDMI port uses 50mA, the camera module requires 250mA, and keyboards and mice can take as little as 100mA or over 1000mA! Check the power rating of the devices you plan to connect to the Pi and purchase a power supply accordingly

3.1.3 BACKPOWERING

Backpowering occurs when USB hubs do not provide a diode to stop the hub from powering against the host computer. Other hubs will provide as much power as you want out each port. Please also be aware that some hubs will backfeed the Raspberry Pi. This means that the hubs will power the Raspberry Pi through its USB cable input cable, without the need for a separate micro-USB power cable, and bypass the voltage protection. If you are using a hub that backfeeds to the Raspberry Pi and the hub experiences a power surge, your Raspberry Pi could potentially be damaged.

3.1.4 FEATURES

- Broadcom BCM2837 64bit ARMv7 Quad Core Processor powered Single Board Computer running at 1.2GHz
- 1GB RAM
- BCM43143 WiFi on board
- Bluetooth Low Energy (BLE) on board
- 40pin extended GPIO
- 4 x USB 2 ports
- 4 pole Stereo output and Composite video port
- Full size HDMI
- CSI camera port for connecting the Raspberry Pi camera

- DSI display port for connecting the Raspberry Pi touch screen display
- Micro SD port for loading your operating system and storing data
- Upgraded switched Micro USB power source (now supports up to 2.4 Amps)
- Expected to have the same form factor has the Pi 2 Model B, however the LEDs will change position

3.1.5 APPLICATIONS

- Use in education
- Use in home automation
- Use in industrial automation
- Use in commercial product

3.2 HUMIDITY &TEMPERATURE SENSOR(DHT11)

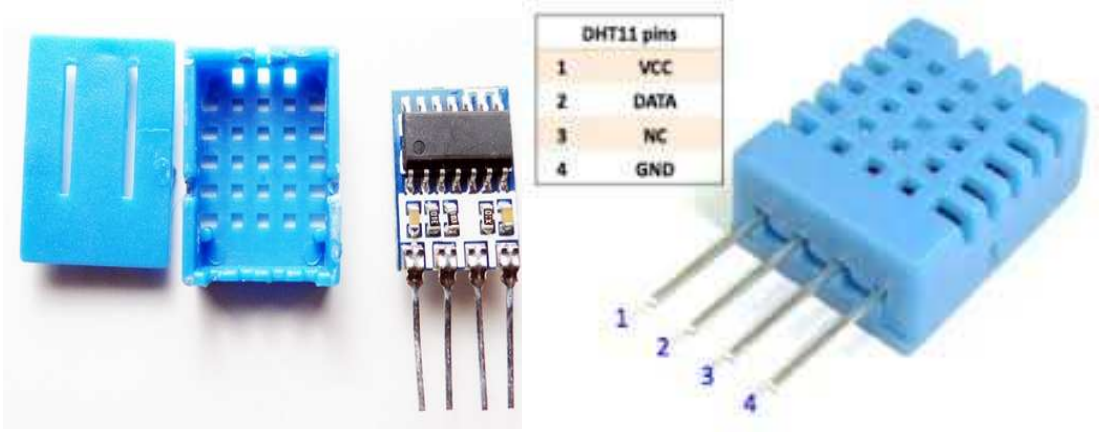


Fig3.2 Pins of humidity & temperature sensor

3.2.1 INTRODUCTION

- The DHT11 is a basic, ultra low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure

the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). It is fairly simple to use, but requires carefultiming to grab data.

- Thermistors are thermally sensitive resistors whose prime function is to exhibit a large, predictable and precise change in electrical resistance when subjected to a corresponding change in body temperature.

- Negative Temperature Coefficient (NTC) thermistors exhibit a decrease in electrical resistance when subjected to an increase in body temperature and Positive Temperature Coefficient (PTC) thermistors exhibit an increase in electrical resistance when subjected to an increase in body temperature

TECHNICAL DETAILS

- Low cost
- 3 to 5V power and I/O
- 2.5mA max current use during conversion (while requesting data)
- Good for 20-80% humidity readings with 5% accuracy
- Good for 0-50°C temperature readings ±2°C accuracy
- No more than 1 Hz sampling rate (once every second)
- Body size 15.5mm x 12mm x 5.5mm
- 4 pins with 0.1" spacing

3.2.2 WORKING

- Coulometric: An electrolyte is formed by absorption of water resulting in a current level which is proportional to the moisture content in the air.

- Gravimetric: A drying agent is exposed to moist air, resulting in weight gain by the drying agent. The increased weight corresponds to the amount of moisture.
- Microwave/Infrared: A transmitted signal varies as the humidity increases. The attenuation is an indication of the moisture content in the medium.

3.2.3 FEATURES

- The product enables wide range of temperature and humidity sensing with high accuracy.
- The product has a new temperature/humidity element FP4 that was developed by Azbil Corporation and enables simultaneous measuring the temperature and humidity, and special functions. The following features are provided:
- Drift recovery functionin order to minimize the output drift, the element is treated in the elevated temperature to vaporize the remained chemicals in the polymer.
- Drift detection functionPeriodically compares the measured drift value with the internal reference value to detect it.
- The product has double elements to enable continuous measurement during while detecting or recovering drift of the element.
- The element is replaceable.

Measurement output function

- Outputs measured temperature, humidity, and dew point temperature in analog (1-5 V or 4-20 mA).

CE marking

- This product conforms to the standards for CE marking.

3.3 SOIL MOISTURE SENSOR

Fig3.3 Pins of Soil moisture sensor

3.3.1 INTRODUCTION

- The moisture sensor board features both analogue and digital outputs. The analogue output gives a variable voltage reading that allows you to estimate the moisture content of the soil .

- The digital output gives you a simple "on" or "off" when the soil moisture content is above a certain value. The value can be set or calibrated using the adjustable on board potentiometer.

- The sensor features a nickel plated anti-rust spade, and a wide sensor to ensure accurate moisture readings. The module uses the LM393 "comparator" chipset to measure the moisture content.

3.3.2 USAGE

The soil moisture sensor is used to measure the volumetric content of soil. This makes it ideal for performing experiments in courses such as soil science, agriculture science, environmental science, horticulture, botany and biology.

Use the soil moisture sensor to

- Measure the loss of moisture over time due to evaporation and plant uptake
- Evaluate optimum soil moisture content for various species of plants
- Monitor soil moisture to control irrigation in green houses
- Enhance your bottle biology experiments.

3.3.3 FEATURES

- Working voltage : 5v
- Working current : less than 20mA
- Interface : Analog
- Depth of detection : 37mm
- Working temperature : 10□ to 30□
- Weight : 3 gram
- Low power consumption
- High sensitivity

3.4 WATER PUMP

Fig3.4Water Pump

- A pump is a device that moves fluids (liquids or gases), by mechanical action.
- Pumps can be classified into three major groups according to the method they use to move the fluid: *direct lift*, *displacement,* and *gravity* pumps.
- Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work by moving the fluid.
- Mechanical pumps serve in a wide range of applications such as pumping water from wells, aquarium filtering, pond filtering and aeration.

3.5 WEBCAM

A webcam is a video camera that feeds or streams its image in real time to or through a computer to a computer network. When "captured" by the computer, the video stream may be saved, viewed or sent on to other networks via systems such as the internet, and emailed as an attachment. When sent to a remote location, the video stream may be saved, viewed or on sent there. Unlike an IP camera (which connects using Ethernet or Wi-Fi), a webcam is generally connected by a USB cable, or similar cable, or built into computer hardware, such as laptops.

The term "webcam" (a clipped compound) may also be used in its original sense of a video camera connected to the Web continuously for an indefinite time, rather than for a particular session, generally supplying a view for anyone who visits its web page over the Internet. Some of them, for example, those used as online traffic cameras, are expensive, rugged professional video cameras.

Fig 3.5Web Camera

There are various types. Some are plugged into computers through USB ports, but others are wireless (wifi).

Other features might include:

i. An integral microphone.

ii. The ability to pan and tilt.

iii. In-built sensors that can detect movement and start recording.

iv. A light that, when on, will let you know that the camera is in use.

3.6 L239D Motor Driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC. Dual H-bridge Motor Driver integrated circuit (IC).A motor driver is a little current amplifier; the function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor.

L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors. L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop the corresponding motor. Logic 01 and 10 will rotate it in clockwise and anticlockwise directions, respectively.

Pin Diagram

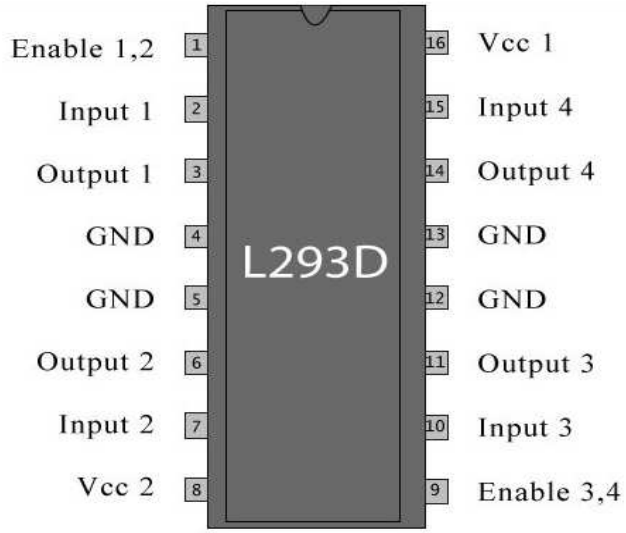


Fig3.6Pin diagram of lm293d

H-Bridge Concept

It works on the concept of H-bridge. H-bridge is a circuit which allows the voltage to be flown in either direction. As you know voltage need to change its direction for being able to rotate the motor in clockwise or anticlockwise direction, Hence H-bridge IC are ideal for driving a DC motor.

In a single l293d chip there two HBridge circuit inside the IC which can rotate two dc motor independently. Due its size it is very much used in robotic application for controlling DC motors. Given below is the pin diagram of a L293D motor controller.

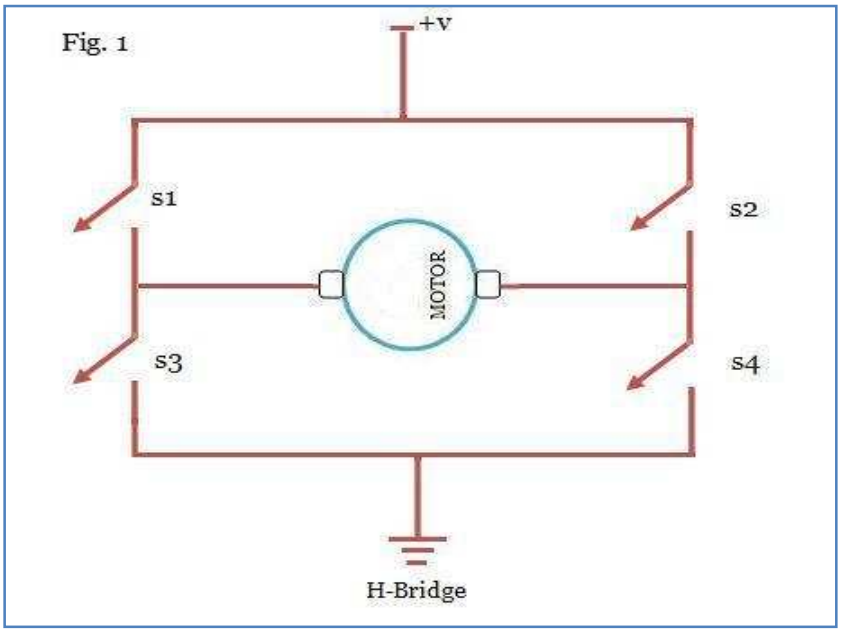


Fig3.6.1 h-bridge circuit

There are two Enable pins on l293d. Pin 1 and pin 9, for being able to drive the motor, the pin 1 and 9 need to be high. For driving the motor with left H-bridge you need to enable pin 1 to high. And for right H-Bridge you need to make the pin 9 to high. If anyone of the either pin1 or pin9 goes low, then the motor in the corresponding section will suspend working. It's like a switch.

CHAPTER 4

SOFTWARE DESCRIPTION

4.1 PROGRAMMING LANGUAGES

4.1.1 HTML

Hypertext Markup Language, commonly referred to as HTML, is the standard markup language used to create web pages. Along with CSS, and JavaScript, HTML is a cornerstone technology used to create web pages, as well as to create user interfaces for mobile and web applications. Web browsers can read HTML files and render them into visible or audible web pages. HTML

describes the structure of a website semantically and, before the advent of Cascading Style Sheets (CSS), included cues for the presentation or appearance of the document (web page), making it a markup language, rather than a programming language.

4.1.2 CSS

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language. Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications.

4.1.3 MYSQL DATABASE

MySQL (officially pronounced as "My S-Q-L") is an open-source relational database management system (RDBMS); in July 2013, it was the world's second most widely used RDBMS, and the most widely used open-source client–server model RDBMS. It is named after co-founder Michael Widenius's daughter, My. The SQL abbreviation stands for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality.

4.1.4 PYTHON

Python is a widely used high-level, general-purpose, interpreted, dynamic programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C++ or Java. The language provides constructs intended to enable clear programs on both a small and large scale.

Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system and automatic memory management and has a large and comprehensive standard library.

Python interpreters are available for installation on many operating systems, allowing Python code execution on a wide variety of systems. Using third-party tools, such as Py2exe or Pyinstaller, Python code can be packaged into stand-alone executable programs for some of the most popular operating systems, allowing the distribution of Python-based software for use on those environments without requiring the installation of a Python interpreter.

CPython, the reference implementation of Python, is free and open-source software and has a community-based development model, as do nearly all of its alternative implementations. CPython is managed by the non-profit Python Software Foundation.

4.2 XAMPP SERVER

XAMPP is a free and open source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages. XAMPP stands for Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing purposes. Everything needed to set up a web server –

server application (Apache), database (MariaDB), and scripting language (PHP) – is included in an extractable file. XAMPP is also cross-platform, which means it works equally well on Linux, Mac and Windows. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server extremely easy as well.

CHAPTER 5

OUTPUT

5.1 ALOGRITHM

STEP 1 Get values from soil moisture sensor.

STEP 2 Get values from temperature &humidity sensor.

STEP 3 Load the values to raspberry pi.

STEP 4 And check level of humidity and temperature level to indicate on a website.

STEP 5 After reaching the threshold value start the motor pump and controlled by driver unit.

STEP 6 Then reaching the moisture level turnoff the motor.

STEP 7 According to the time period pesticides are sprayed automatically.

STEP 8 Each value is displayed and controlled in the website.

Home Page of the website is shown below and it contains Login, Components, Camera, Logout and Refresh button on the navigation bar.

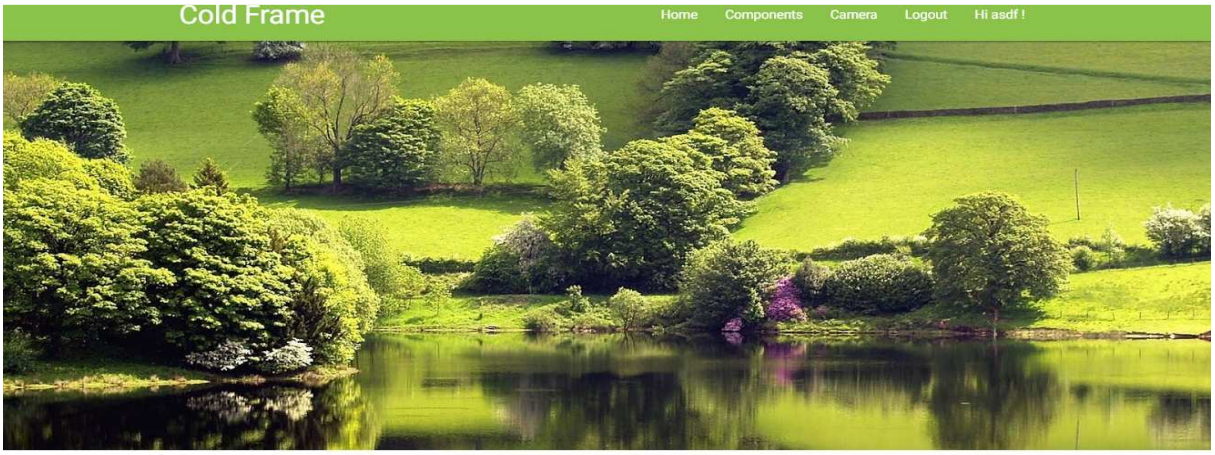


Fig 5.1Home Page -Web Page

User should login to control the appliances shown in Fig.5.2, once logged in their login is saved in session. Hence there is no need for sign in at each time they entered until they click the logout button manually.

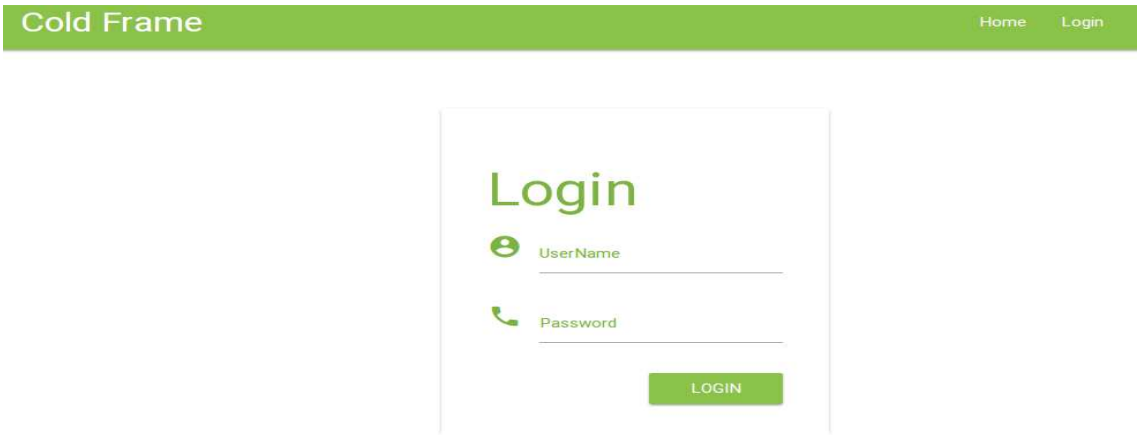


Fig 5.2Login Page – Webpage

Components shows the current data about the home appliances shown in Fig.5.3. And one can switch those lights or water pump or any other appliances on that page and make changes will enable that data to be changed in the Database.

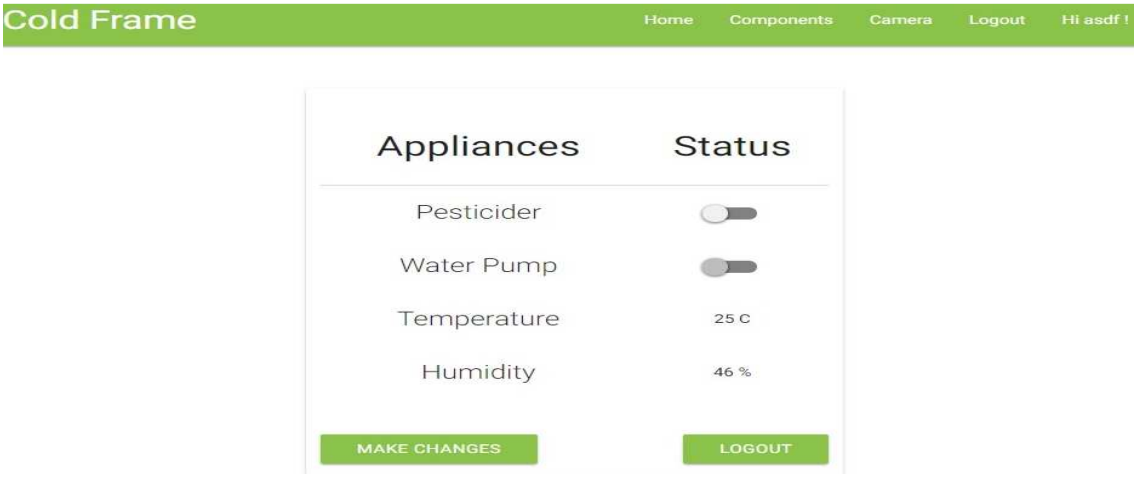
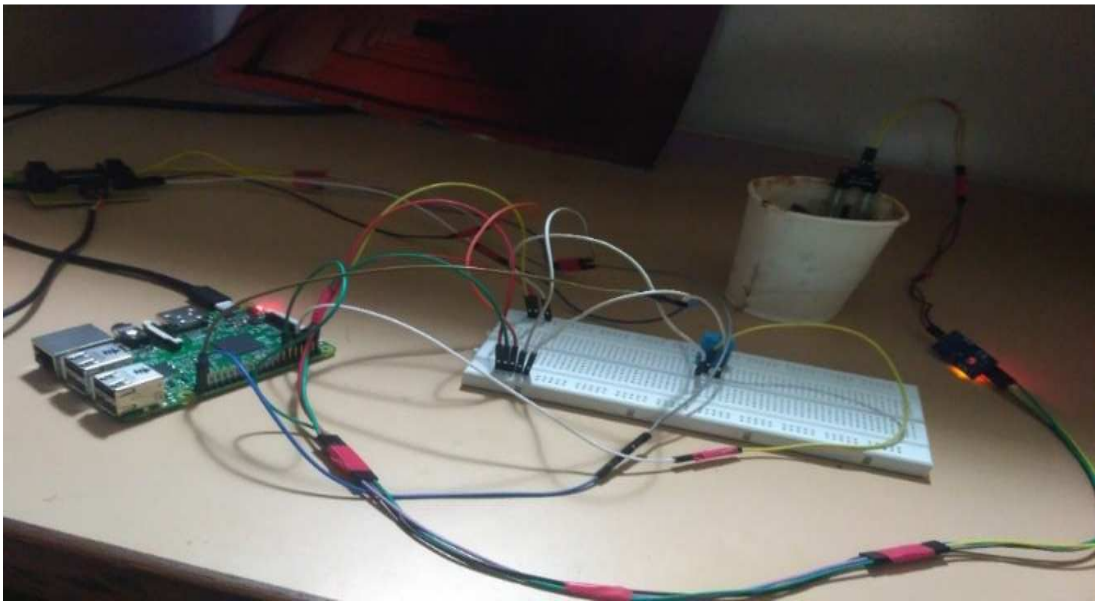


Fig 5.3Components-Webpage

Camera, Front door is constantly live feed to the webpage. User can watch them live on the camera. And they could ensure the plant health and surveillance the farm by anywhere in the world.

5.2 WORKING MODEL

The working model of the project along with all its components is shown in fig.5.4



CHAPTER 6

CONCLUSION

The world is at the edge of emerging new technologies and newer inventions are along worldwide in our day to day life. Cold frame is an important factor that it reduces human work through the implementation of embedded using softwares and hardwares. This work presents the smart

irrigation system so that it is possible to control and access electrical devices from all over the world through the internet.

SIGNIFICANCE OF THE PROJECT:

Using Raspberry Pi and a combination of a soil moisture & humidity sensor, a camera, a DC motor, a Water sprayer for our implementation, this project achieves let everyone to do the agriculture.

ENHANCEMENTS OF THE PROJECT:

The further enhancement that can be made is interfacing the ph sensor and video monitoring, in order to automatically detect the diseases and to spray the pesticides according to it so we can easily find the error it updates the information.

REFERENCES

1. Dr . V . Vidya Devi, G. Meena Kumari, “Real- Time Automation and Monitoring System for Modernized Agriculture”,International Journal of Review and Research in Applied Sciences and Engineering (IJRRASE) Vol3 No.1. PP 7-12, 2013

2. Y. Kim, R. Evans and W. Iversen, “Remote Sensing and Control of an Irrigation System Using a Distributed Wireless Sensor Network”, IEEE Transactions on Instrumentation and Measurement, pp. 1379–1387, 2008.
3. IoT based Smart Agriculture, Nikesh Gondchawar, Prof. Dr. R. S. Kawitkar.
4. S. R. Nandurkar, V. R. Thool, R. C. Thool, “Design and Development of Precision Agriculture System Using Wireless Sensor Network”, IEEE International Conference on Automation, Control, Energy and Systems (ACES), 2014
5. www.raspberrypi.org/ (Raspberry Pi)
6. www.apachefriends.org/ (Xampp Software)
7. www.python.org/ (Python)
8. www.w3schools.com/ (Tutorial for Programming)
9. www.tutorialspoint.com/ (Tutorial for Programming)