

RASPBERRY PI Based Greenhouse Management System

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Abstract: In an trade throughout bound hazards is are going to be terribly tough to observe the parameter through wires and analog devices like transducers. The greenhouse vegetable production desires less labor, less capital, has quicker returns than traditional vegetable production. And it can't be simply influenced by the climate. thus the greenhouse vegetables are wanted by vegetable growers. it's terribly tough to manage scattered greenhouse while not a far off surroundings observation system.

This project uses sensing elements such Temperature sensor (LM35), LDR. The temperature sensing element LM35 senses the temperature and converts it into an electrical (analog) signal, that is applied to the small controller through ADC. The analog signal is regenerate into digital format by the analog-digital converter (ADC). because the explicit temperature device is activated high, the load (Fan) is ON. within the same approach the LDR senses night, the load (bulb) are going to be ON. Here two temperature sensors and two LDR sensors are used. Raspberry pi is that the heart of the whole system. The Raspberry Pi could be a credit-card-sized single-board pc developed within the UK by the Raspberry Pi Foundation. The Raspberry Pi incorporates a Broadcom BCM2835 system on a chip which has an ARM1176JZF 700 rate processor Video Core IV GPU and was originally shipped with 256 megabytes of RAM, later Upgraded to 512 MB. It doesn't embody a constitutional fixed disk or solid-state drive, however Uses an SD card for booting and long storage.

Keywords: Raspberry Pi, Temp Sensor, LDR, Load, Etc.

I. INTRODUCTION

We live in a world wherever everything is controlled and operated mechanically, however there are still a couple of vital sectors in our country wherever automation has not been adopted or not been place to a full-fledged use, maybe as a result of many reasons one such reason is price. One such field is that of agriculture. Agriculture has been one in all the first occupations of man since early civilizations and even nowadays manual interventions in farming area unit inevitable. Greenhouses kind a very important a part of the agriculture and farming sectors in our country as they'll be accustomed grow plants underneath controlled atmospheric condition for optimum manufacture. Automating a greenhouse envisages watching and dominant of the environmental condition parameters that directly or indirectly govern the plant growth and therefore their manufacture. Automation is method management of commercial machinery and processes, thereby exchange human operators.

II. LITERATURE SURVEY

We have studied many previous works done in this field by different researchers. Use of technology in the field of

agriculture plays important role in increasing the production as well as in reducing the man power efforts. Research for improving agricultural production by utilizing different controllers like PIC microcontroller, 8051 controller, ARM 7 etc or also monitoring done by different communication technology like Zigbee, Wireless sensor network (WSN), even using GSM.

Greenhouse monitoring and control system based on wireless Sensor Network.

In this paper a WSN was implemented by deployed wireless sensor nodes in a greenhouse with temperature, humidity, moisture light, and CO₂ sensors. To control the environmental factors, the used microcontroller programmed to control the parameters according to preset values, or manually through a user interface panel. [1]

A ZigBee based energy efficient environmental monitoring alerting and controlling system,

The paper based on paper a novel ZigBee based energy efficient environmental monitoring, alerting and controlling system for agriculture is designed and implemented. This system utilizes an ARM7 processor, various sensors and

ZigBee communication module. Sensors gather various physical data from the field in real time and transmit it to the processor and to the end user via ZigBee communication. Then necessary actions are initiated to perform action on behalf of people to reduce or eliminate the need of human labor.[3]

III. OBJECTIVES

The objective of the project is automating a greenhouse envisages monitoring like and controlling of the climatic parameters which directly or indirectly govern the plant growth and hence their produce. Automation is process control of industrial machinery and processes, thereby replacing human operators. The system is an embedded system which will closely monitor the temperature, moisture, light and control the microclimatic parameters of a greenhouse on a regular basis round the clock for cultivation of crops or specific plant species which could maximize their production over the whole crop growth season and to eliminate the difficulties involved in the system by reducing human intervention to the best possible extent.

IV. EXISTING SYSTEM:-

In the existing system we use different modules such as, LPC2148 as controller, Moisture sensor, Humidity sensor, relay, switch, buzzer, dc fan. This project uses sensors such as A humidity sensor is also given to know about the humidity of that soil. By having knowledge of all these one can take action accordingly. Moisture sensor sense the soil is dry or wet. If soil is dry automatically water motor will get ON through relay. If temp increases buzzer beep, show on LCD and fan gets ON. Lcd shows that temp is increases.

V. PROPOSED SYSTEM

It is very difficult to control scattered greenhouse without a remote environment monitoring system. Now in proposed system we are implementing the project in which RASPBERRY PI as a controller. Light sensor is used for checking it's Day or night. And temp sensor used to sense the temp of environment.

If temp increases then fan will be ON automatically. If light sensor is activated then bulb will ON.

VI. BLOCK DIAGRAM

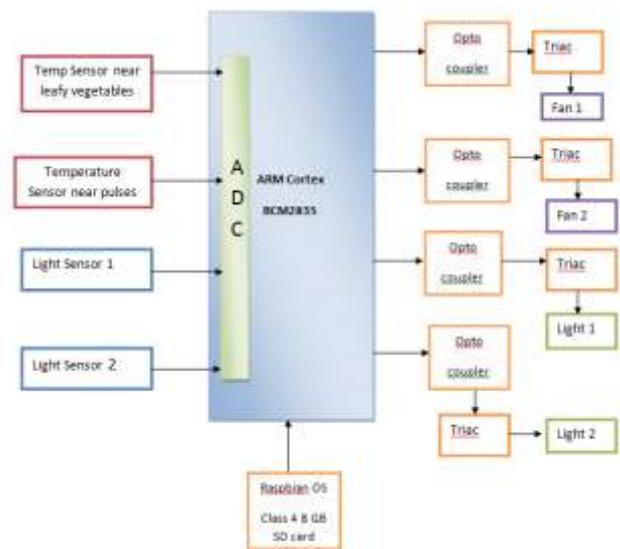


Fig. Block Diagram.

VII. BLOCK DIAGRAM DESCRIPTION

In this project we use different modules such as, RASPBERRY PI as controller, Temperature sensor, light sensor, optocoupler, traic, bulb, dc fan.

This project uses sensors such as A temp sensor is also given to know about the temp of the environment .

By having knowledge of all these one can take action accordingly. Light sensor sense the it's day or night. If is day automatically bulb will get ON through TRIAC.

If temp is > 30, and fan gets ON.

VIII. HARDWARE REQUIREMENT

- RASPBERRY PI
- LIGHT SENSOR
- TEMP SEN SOR
- LOAD
- TRAIC
- OPTOCOUPLER

RASPBERRY PI



Fig. Raspberry Pi Board

Raspberry Pi Model, 512 Mb with a nice black plastic case: 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 has the ability to interact with the outside world, and has been used in real time applications. This board is the central module of the whole embedded image capturing and processing system as given in figure. Its main parts include: main processing chip, memory, power supply HDMI Out, Ethernet port, USB ports and abundant global interfaces.

TEMP SENSOR

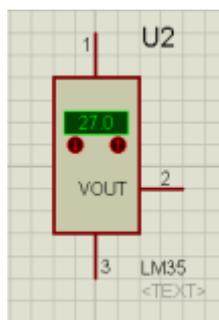


Fig. LM 35.

The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in ° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The high-accuracy version of the LM35 does not require any external calibration or trimming to provide typical accuracies of $\pm 1/4^\circ\text{C}$ at room temperature and $\pm 3/4^\circ\text{C}$ over a full -55 to $+150^\circ\text{C}$ temperature range.

IX. ADVANTAGES

- Reliability
- Ease of Operation
- Useful to detect harmful gases
- Can be used as electrolytic applications

X. APPLICATIONS

- Can be used in Mines to detect presence of dreadful gases.
- In public places like shopping malls, etc, this project can be applied where public safety is a major task.
- In hospitals and sensitive areas also this project can be implemented.
- In Marine Applications

XI. CONCLUSION

This paper, design and implementation of a “**Energy Management of Greenhouses in Smart Grids.**”

The objective is to minimize total energy costs and demand

charges while considering important parameters of greenhouses; in particular, inside temperature and light sensor, lighting levels should be kept within acceptable ranges. The proposed system is capable of controlling the essential parameters necessary for plant growth, viz. temp will be control using dc fan. Also this proposed system of farming is user-friendly and highly robust.

XII. FUTURE SCOPE

This project will be increased by victimization GSM or any wireless detector network to transmit the information for the standing observance. Also in future we are able to use IOT module to update sensor information on net server. The wetness detector can even be enclosed to understand the standing of it and may be controlled through the Motor.

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