

Auto Monitoring and Control of Environmental Parameters for Green House System

Priyanka Jayram Gurao

Department of Electronics Engineering
TERNA ENGINEERING COLLEGE,NERUL,NAVI MUMBAI, India

Maruti Limkar

Department of Electronics Engineering
TERNA ENGINEERING COLLEGE, NERUL, NAVI MUMBAI ,India

Abstract- In Green House growth of plants depends on external environmental factors such as temperature ,PH of soil, moisture of soil, atmospheric humidity etc. In Proposed system environmental parameters like light intensity, moisture in air, temperature and concentration of gases is monitored and factors like growth of plants can be affected by variation in these parameters, so if one of the parameter is changes ,it can be monitored by eternally automatically controlled environment designed in proposed system e.g. reduced light intensity can be compensated or reduced temperature can be brought back to desired value by applying heater. All such factors govern growth of plants in green house. In such a way green house system can be designed. For sensing of parameters different sensors are used .For remote monitoring and control, GPRS system is developed in which ARM7 controller is used for data acquisition.

Keywords –GPRS , ARM7 controller.

I. INTRODUCTION

Green house is basically a structure primarily of glass in which temperature, light and humidity can be controlled for cultivation and protection of plants.

As the law of limiting factors says too little or too much of any one factor can limit the growth of plants even if all other factors are at or near the optimum level required by that plant.

An ARM7 controller based automatic monitoring and controlling system is developed which uses sensors to sense environmental parameters.ARM7 controller collects and processes the information about environmental factors and these data is sent to remote monitoring and control unit or center through GPRS system.

Changes in parameters is displayed at monitoring center and if parameters are above or below specified limits then controlling system adjusts them within limits.

The special feature of this project is whole system works on Electricity generated by using Solar panel,as green houses located at remote area cannot get electricity due to problem of extension of power grids at those locations.

II. SYSTEM ARCHITECHTURE

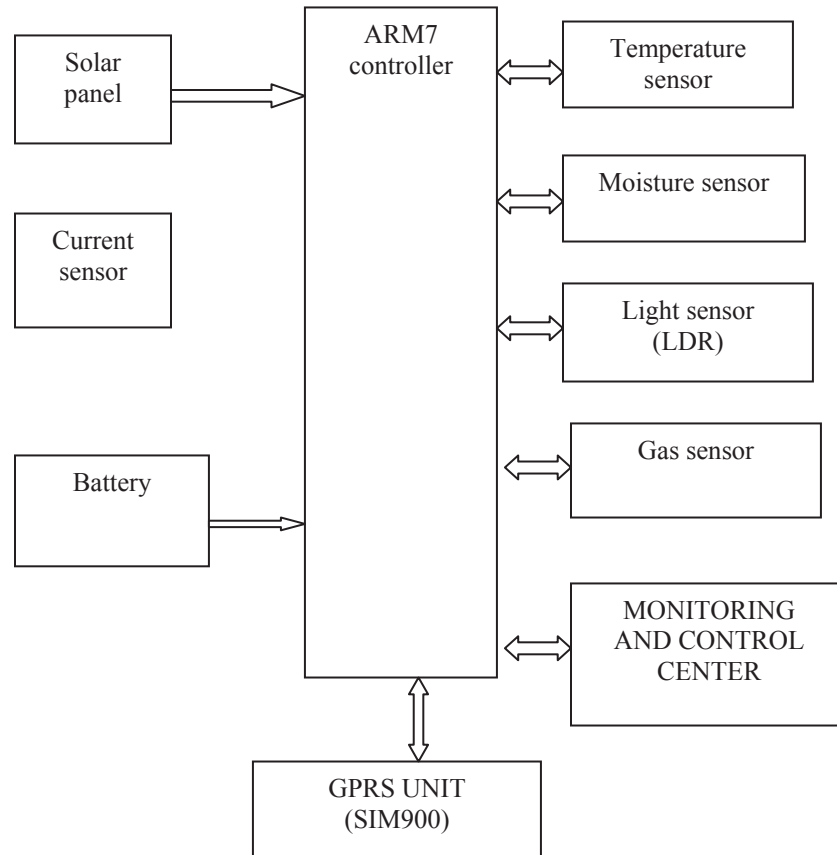


Fig1. System Architecture of proposed System

In this system the core processor LPC2148 collects the data from different sensors such as humidity sunlight ambient temperature and gas and checks and measures current from solar panel. Here LPC2148 processor is responsible automatic analysis of data , processing, displaying and sending to the monitoring centre by using wireless communication technique. When data is sent to monitoring center via internet ,it is recorded at cloud network .Cloud can permanently store data and these data can be anytime retrieved at any place. Monitoring center uses VB6.0 to display data .CPU consisting of memory keeps log of these data. Control of Parameters can be achieved by programming ARM7 controller. Programming is done in keil C microversion4. Variation in Parameters such as light intensity ,moisture, temperature and gases all are ultimately is responsible for growth of plants in green house. Thus monitoring as well as controlling of environmental parameters can be achieved. In controlling part relays are activated while switching to controlling devices, e.g. if temperature goes low, heater is made ON and if light intensity goes low ,artificial light is provided using relay2.

III. FLOWCHART

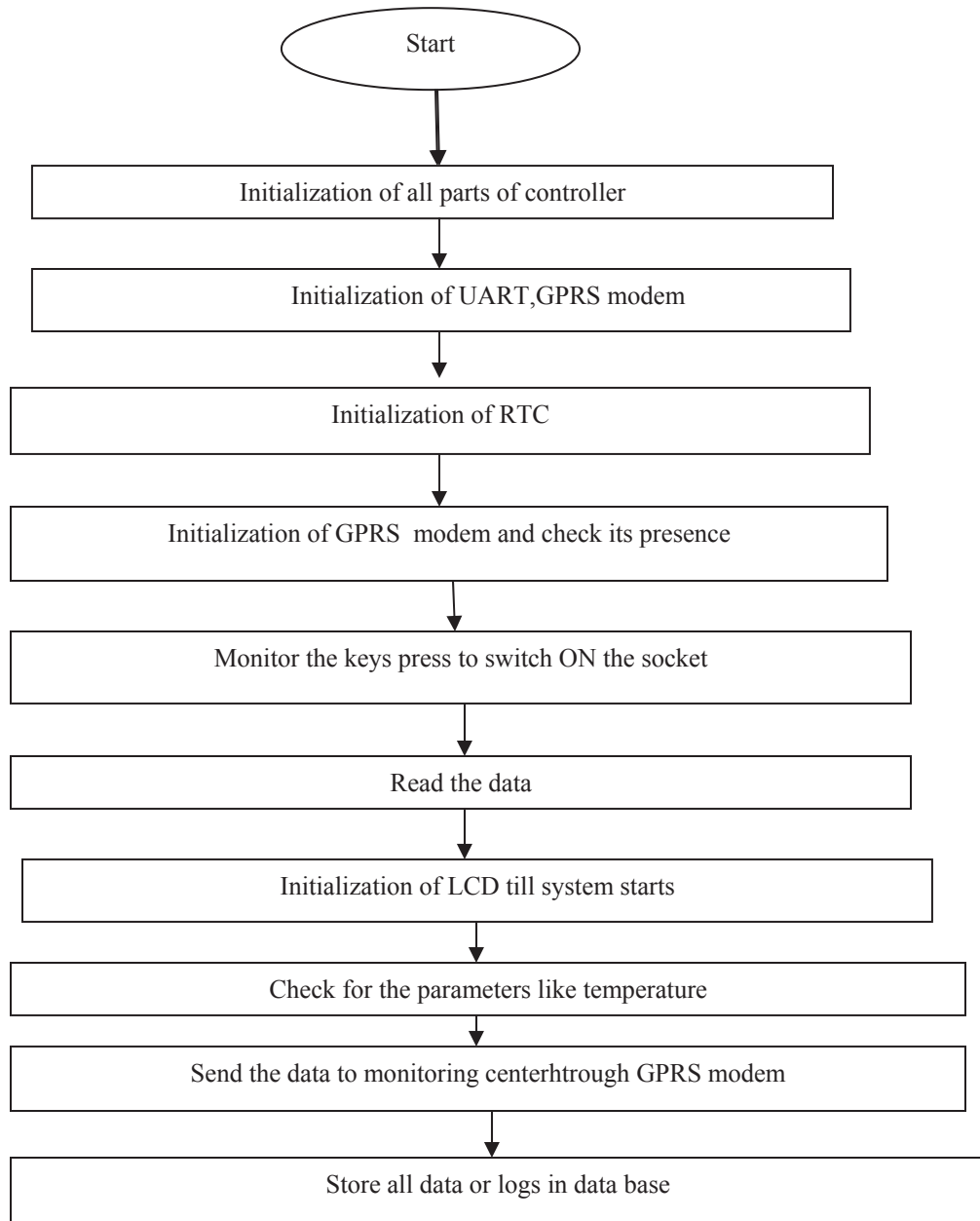
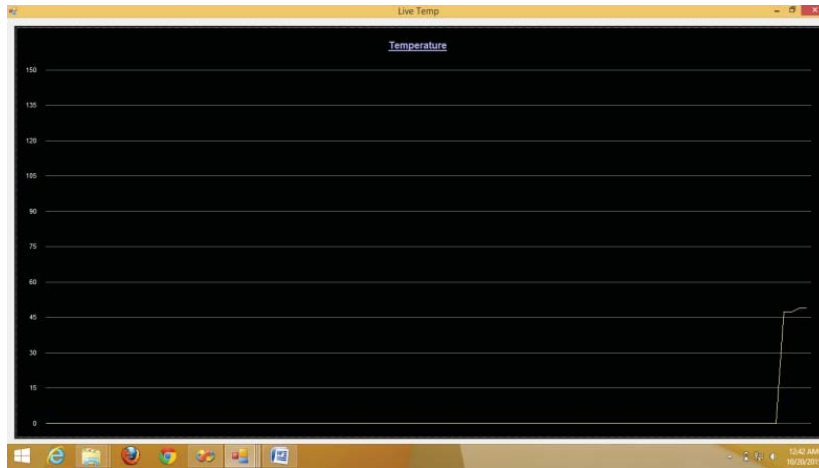
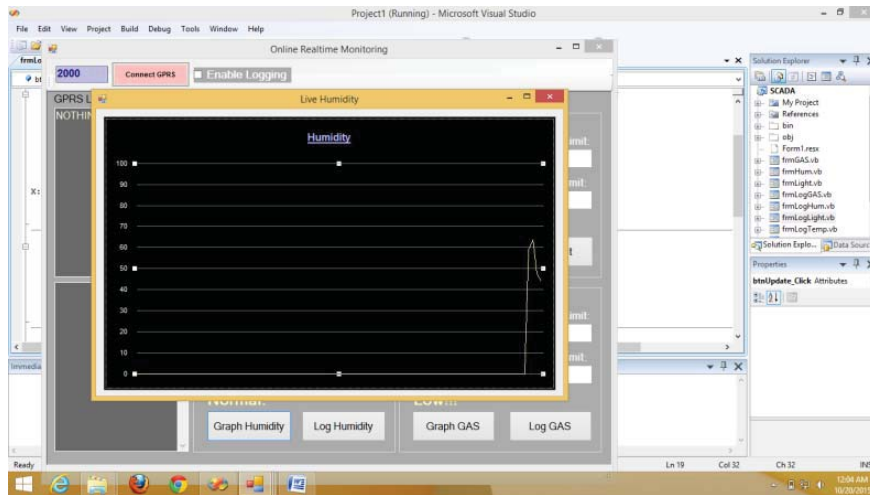


Fig2. Flowchart Of Proposed System

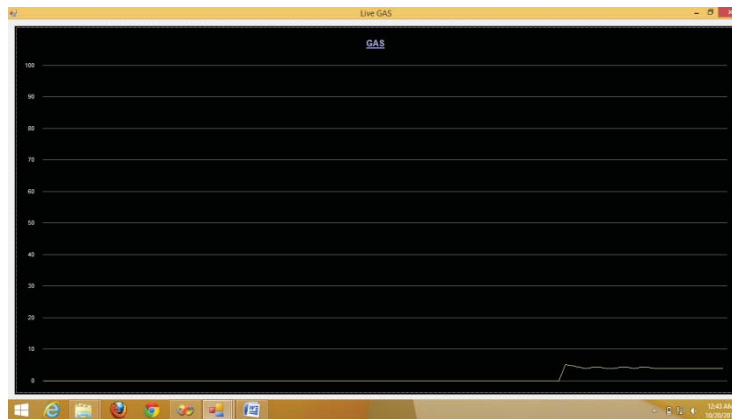
IV. ANALYSIS AND RESULTS



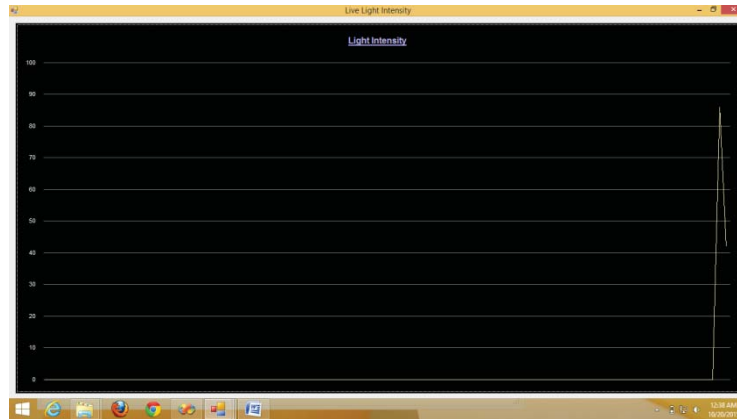
Fig(1) Temperature variation



Fig(2) Variation of humidity

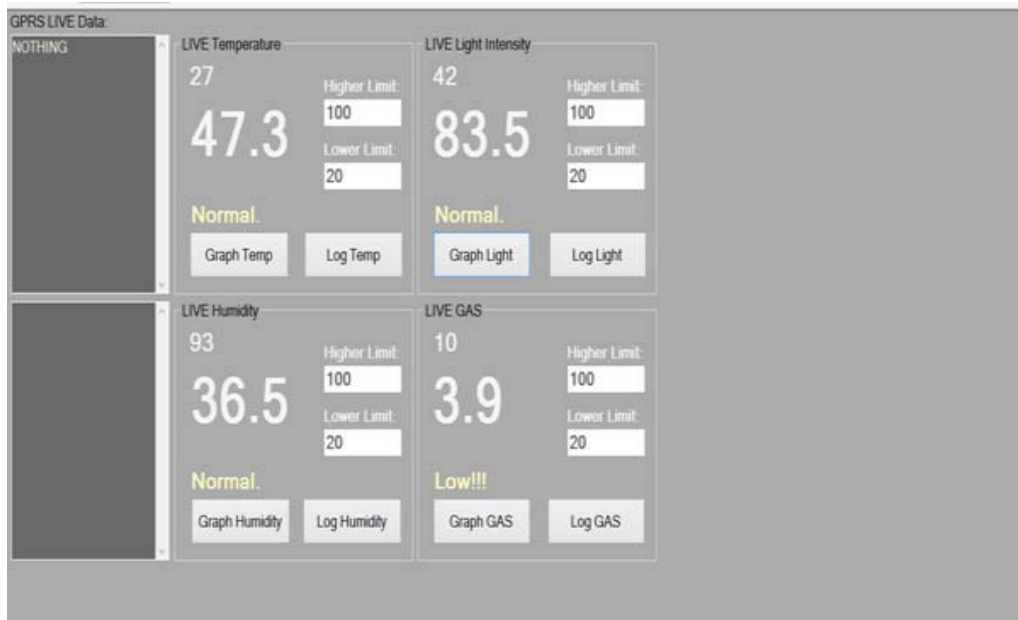


Fig(3) variation of Gas



Fig(4) Variation of light intensity

V. RESULTS



Fig(5)

Above figure shows digital values of various parameters such as Live temperature, Live humidity, live moisture, and Live Gas, these values are converted values calculated by converting analog signal sensed by sensors and analog data is converted into digital values by ADC i.e. Analog to digital converters of inbuilt in ARM7 controller.

Parameters	Upper limit	Lower limit	Observed value	Remark
Humidity	100	20	36.5	Within the range
temperature	100	20	47.3	Within the range
Light intensity	100	20	83.5	Within the range
Gas	100	20	3.9	Below the range

V.CONCLUSION

Thus it is observed and noted that different parameters of green house are monitored and controlled by using proposed system .Thus growth of plants can be controlled and plants can be protected from variation of parameters to extreme e.g.If light is very low,then growth of plants can be affected and they won't grow properly,growth will be limited .If temperature goes low then same thing can happen ,so by suing relay switching circuit,variation in parameters can be controlled and adjusted such that it can be maintained to help plants grow properly.

REFERENCES

- [1] Solar power wireless monitoring based on arm7
<http://ieeexplore.ieee.org/978-1-4577-0536-6/11>
- [2] The Arm Architecture Leonid Ryzhyk <Leonidr@Cse.Unsw.Edu.Au> June 5, 2006
Solar Power Systems Web Monitoring, The 2nd symposium on renewable energy technology (soret),october2011,raiwai ,Fiji
- [3] jeit.com/Vol%203/Issue%2010/IJEIT1412201404_32.pdf
- [4] www.ieee.org