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Automatic Irrigation System Using Scada

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ABSTRACT

One of the most important problems facing the agricultural sector, irrigation is indiscriminate and others regularly, causing wastage of large quantities of water, and we will work in this project to solve this problem using the SCADA system, which provides command and control and collect data on irrigation to rationalize and streamline the process of irrigation.

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I. INTRODUCTION

In an agricultural environment, awareness has increased about implementing technology into the industry. manual collection of data for desired factors can be hectic, non-continous and produce variations from incorrect measurement taking. this causes difficulty in controlling these important factors. wireless distinct sensor nodes can reduce time and effort required for monitoring an environment. data logging allows for reduction of data being lost or misplaced. also it would allow placement in critical locations without the need to put personnel in hazardous situations. monitoring systems can ensures quicker response times to adverse factors and conditions, better quality control of the produce and a lower labour cost. this technology would allow for remote measurement of factors such as temperature, humidity, atmospheric pressure, soil moisture; water level and light detection. steps taken to increase development aimed towards wireless solutions compared to wired-based systems. one particular reason is that the sensor location can often require being repositioned and a traditional wire layout could cost a substantial deal of time and energy in order to address such wiring problems.
high - quality agriculture(enviroment friendly) has been investigated in order to improve the farming practices in greenhouses. a recent development in the field of wireless sensor networks as well as miniaturization of the sensor nodes has allowed precision agriculture to emerge. precision agriculture concentrates on providing the means for harvest information, work management and growth information. greenhouse environment monitoring and control can help to improve productivity through prevention of diseases in the crops. the dew condensation phenomenon occurs in the greenhouse when the dew point temperature is higher than the temperature of crops, and it is deeply related to relative humidity. when, too close to sunrise with the high humidity at daybreak or when humidity inside a greenhouse is too high, the temperature inside a greenhouse gets to rise rapidly but the temperatures of crops rise slowly. thus the huge difference between the environmental temperature and the crop temperature causes the dew condensation phenomenon to occur. removing the dewdrops and dewdrop condentation are important for growing crops in the greenhouse.

II. LITERATURE SURVEY

A Wi-Fi based Smart Wireless Sensor Network for an Agricultural Environment. Presented at 2011 Fifth International Conference on Sensing Technology by Gerard Rudolph Mendez, MohdAmri Md Yunusand, Dr.Subhas Chandra Mukhopadhyay. They have discussed about the

methods of monitoring agricultural environments for various factors such as temperature, humidity, light, soil moisture and pressure level.

1. Product Survey - Nano Ganesh. It is a product developed by Mr.Santosh Ostwal. It has various farmer friendly applications like water pump can be controlled wirelessly over large distances, mobile network is essential near water pumps, check of availability of power supply at motor end, provision of memory to store on-off commands, etc.

2. Network Embedded Greenhouse Monitoring and Control by Stipanicev, D. Marasovic, J. They have discussed the various methods of greenhouse monitoring like control of amount of light to be let in and adjusting that according to seasons, adjusting the temperature of the room from time to time by switching on the fan, taking reading of temperature, pressure and humidity in various corners of the greenhouse to get a comprehensive reading.

3. A Design of Greenhouse Monitoring and Control System Based on ZigBee Wireless Sensor Network by Zhou, Y.; Yang, X.; Guo, X.; Zhou, M.; Wang, L. This paper proposes an automatic dew condensation control system for maintaining proper humidity and temperature in crop cultivation and preventing the proliferation of diseases that can result from formation of dew on a leaf surface. The temperature of the dew point is calculated with a Barenbrug Sensors formula at an environmental server using ambient temperature and relative humidity as well as leaf temperature data collected by sensors.

III.EXPERIMENTAL PROCEDURE

A. Methodology:

The embedded system will closely monitor and control the microclimatic parameters of agriculture on time 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 without any human intervention. The system comprises of sensors, Analog to Digital Converter, microcontroller and actuators. When any of the above mentioned climatic parameters cross a safety threshold which has to be maintained to protect the crops, the sensors sense the change and the microcontroller reads this from the data at its input ports after being converted to a digital form by the ADC. The microcontroller then acts by employing relays until the strayed out parameter has been brought back to its required level. Since a microcontroller is the heart of the system, it makes the set-up low-cost and effective nevertheless. As the system also employs an LCD display for continuously alerting the user about the condition inside the greenhouse, the entire set-up becomes user friendly and easy to control.

B. Block diagram:

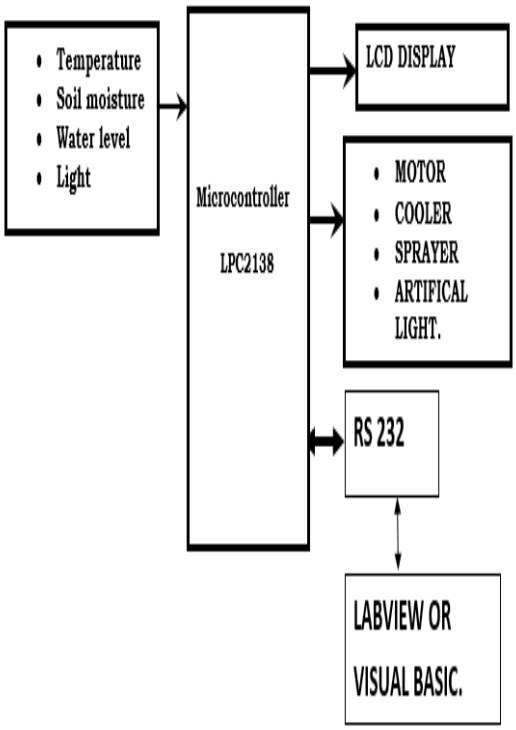

fig.1: Block diagram

The Fig.1 can be divided into three parts they are as follows:-
1) Sensors
2) Microcontroller.
3) Actuators
4) Computer for Labview.

1. Sensor
This part of the system consists of various sensors, namely soil moisture, humidity, temperature and light. These sensors sense various parameters- temperature, humidity, soil moisture, level measurement and light intensity and are then sent to the Analog to Digital Converter.

2. Microcontroller
The microcontroller is the heart of the proposed embedded system. It constantly monitors the digitized parameters of the various sensors and verifies them with the predefined threshold values and checks if any corrective action is to be taken for the condition at that instant of time. In case such a situation arises, it activates the actuators to perform a controlled operation. Most of the data acquisition work is done by microcontroller.

3. Actuators
An array of actuators can be used in the system such as relays, contactors, and change over switches etc. They are used to turn on AC devices such as motors, coolers, pumps, fogging machines, sprayers. For the purpose of demonstration relays have been used to drive different AC

devices. These actuators are final parts of this system which work as controlling flow of water, temperature and humidity of soil.

4. Lab view

It is software used to make a GUI(Graphical user Interface) model on PC which uses a front panel. A complete pictorial model can be achieved in Labview. The following figure will explain more about the working of system using Lab view.

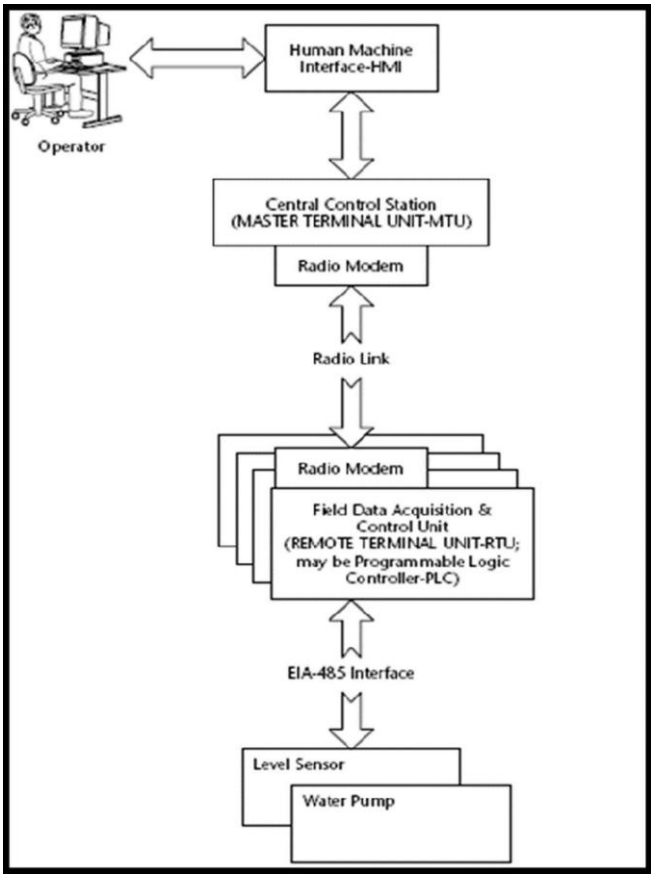

fig. 2 Lab view

IV. CONCLUSION

Main approach behind designing the microcontroller based system is for measurement and control of for vital parameters for cultivation/growth i.e. temperature, humidity, soil moisture and light intensity .Our system has given reliable results. The main advantage over old system are low power consumption ,maintenance ,complexity and also maintaining environment .Thus further reduction in cost of software and hardware will encourage use of our system in agriculture field giving surplus boost to production quantity and quality .Further improvements can be made by using less expensive and more reliable sensors. The enhancements may seem in future such systems can be developed and tested at prototype level. These improvements are not impossible and can be carried out successfully.

REFERENCES

[1]. L.L pfitscher, D.P bernardon , "An automated Irrigation system for Rice Cropping", Devices, Circuits and Systems (ICCDCS), 2012 8th International Caribbean Conference on 14-17 march 2012.

[2]. Hassan A Abu Mteer under guidance of Dr.HatemElaydi, "SCADA irrigation system", presented at The Islamic University Gaza, June 2007.

[3]. Stipanicev D., Marasovic J., "Networked embedded greenhouse monitoring and control",Proceedings of 2003 IEEE Conference on Control Applications, June 2003.

[4]. Turnell, D.J. de Fatima, Q.V., Turnell, M., Deep, G.S., Freire, R.C.S., "FarmWeb-an integrated, modular farm automation system", Proceedings of IEEE International Conference on Systems, Man, and Cybernetics, Vol. 2, Oct. 1998.

