

# LabView based Control of Agricultural System

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**Abstract**— With the rapid race of globalization and an ever increasing global population, the agricultural field has great importance and the need to synthetically create the ideal environmental conditions is very essential. Suitable environmental conditions are necessary for finest plant growth, enhances crop yields and capable use of water and other resources. Automating the data acquisition process of the soil conditions and various climatic parameters that manage plant growth allows information to be collected at high frequency and with less labor necessities. We therefore need a system that is easy to install, simple to use. So we came up with a LabVIEW based monitoring system which can monitor and record temperature, humidity, soil moisture and sun light, which is constantly customized and can be controlled in future to optimize these resources so that the plant growth and yield is maximized. The use of easily available components reduces the industrial and safeguarding costs. The ease of operation and use of the LabVIEW software makes it more suitable to this process and one important part of this project is Data Acquisition (DAQ) Card.

**Keywords:**- *LabView Software, Data Acquisition (DAQ) Card.*

## I. INTRODUCTION

Virtual instrumentation combines mainstream commercial technologies, such as the PC, with flexible software and a wide variety of measurement and manage hardware. Engineers use virtual instrumentation to carry the power of flexible software and PC technology to test, control and design applications making precise analog and digital measurements. Engineers and scientists can create user-defined systems that assemble their exact application needs. Industries with automatic processes, such as chemical or manufacturing plants use virtual instrumentation with the goal of improving system productivity, reliability, safety, optimization and stability. Virtual instrumentation computer software that is user would employ to develop a computerized test and measurement system for controlling from a computer desktop [3].

A virtual instrument (VI) is defined as an industry-standard computer set with user-friendly application software, cost-effective hardware and driver software that together perform the functions of conventional instruments [2]. Replicated physical instruments are called virtual instruments (VIs). Virtual instrumentation software based on user requirements defines general-purpose measurement and manages hardware functionality [3]. With virtual instrumentation, engineers and scientists reduce improvement time, design higher quality products, and lower their design costs. In test, measurement and control, engineers have used

virtual instrumentation to rationalize automated test equipment (ATE) while experiencing up to a several times increase in productivity gains at a small part of the cost of traditional instrument solutions.

## II. LABVIEW SOFTWARE

The term “VI” owes a lot to the progress of the Laboratory Virtual Instrument Engineering Workbench (LabVIEW) by National Instruments, Austin, Texas, USA. In 1983, National Instruments began to look for a way to decrease the time needed to program instrumentation systems. LabVIEW is a very good high level language with an extra advantage of built-in graphical user interface (GUI). It is quite user-friendly software and flexible to give better system performance. Our system will also in real time indicate values of all parameter such as Temperature, light intensity, soil moisture and Humidity. These values can be used to decide at what time water and pesticide has to be sprayed on the plants. In our System we propose to control a pesticide pump and a Water pump through our LabVIEW based system. Date will be transferred to the software through serial interface.

## III. DATA ACQUISITION (DAQ) CARD

DAQ is data acquisition. It is device which contains both ADC & DAC in it. It is interface between analog output of sensor and the PC. The data traditional experiments in it indication from sensors are sent to analog or digital field, read by experimenter, and recorded by hand. In automated data acquisition systems the sensors transmit a voltage or current signal directly to a computer via data acquisition board. Software such as LabVIEW controls the acquirement and processing of such data. The benefits of automated systems are as follows:

- [a] improved accuracy of recording.
- [b] Increased frequency with which measurements can be taken.
- [c] Potential to automate pre and post processing and built in quality control.

## IV. METHODOLOGY

The main work is preparation of DAQ Card. The block diagram of LabView based control of agricultural system is shown in figure [1].

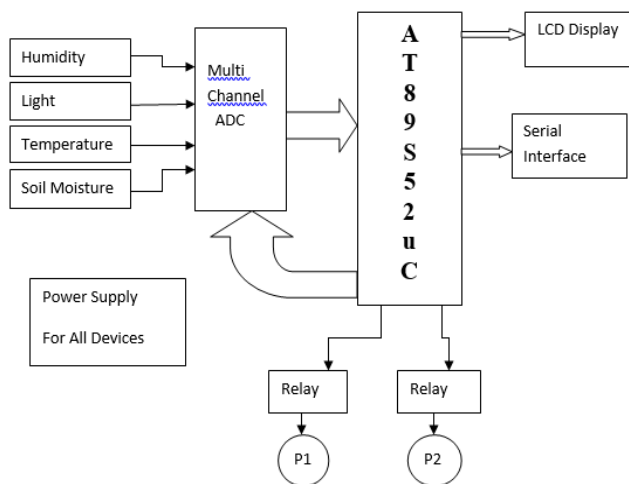


Fig.[1] Block Diagram of LabView Based Control Of Agricultural System

According to the given diagram proposed system will acquire data through the sensors. Analog signal from sensors will be given to 8 bit or 12 Bit Analog to Digital Converter. Here since there are four signals we require at least 4 channels ADC. ADC used will be 8 channels for future enhancements or if we require more sensors in the system. When in field, it is also required to know ambient conditions at that instant. For this real time data is displayed on LCD (16X2) 16 Character, 2 Lines. Microcontroller selected is Atmega 89C52 based on Intel 8051 Architecture. It has 8K ROM, 256 bytes RAM, 3 Timers, Serial interface, 4 I/O Ports which are sufficient for our application. Serial interface is required to interface this DAQ card to PC. PC will display this data in real time. PC will also log data in real time for future analysis. Another function PC serves is to switch ON/OFF water pump and pesticide pump as scheduled or manually.

## V. CONCLUSION

An all over study has been made about LabVIEW. With this project atmospheric temperature, relative humidity, light and soil moisture occurrence can be detected & monitored. This Centralized farm monitoring system which automatically monitors the farm is done in our project and it provides better development in the field of agriculture because it has extensive application which is applicable in the modern society.

It can be created in the market in wide range with high precision. By doing this project what we have tried to do is to make just a demo of it. The most difficult part of the project was to calibrate the sensor output. It is done in maximum possible extend.

## VI. FUTURE SCOPE

The importance of agricultural field is getting more significant during these recent days. It will increase in near future. So the system can be improved for controlling the atmospheric condition. It can be implemented in any variety of plantations. Centralised monitoring can be done efficiently in the case of a large area plantation. This system can be installed in place where any of the parameters such as light, humidity, temperature, soil moisture is controlled.

## VII. ACKNOWLEDGMENT

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