



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 Issue: III Month of publication: March 2017

DOI: <http://doi.org/10.22214/ijraset.2017.3151>

www.ijraset.com

Call: ☎ 08813907089

E-mail ID: ijraset@gmail.com

Nek Soil Measurement and Automatic Fertilizer Dispense

Ms. Rasal Pallavi M.¹, Ms. Tilekar Sanjivani B.², Ms. Todkar Anushri D.³, Prof. S. A. Jagtap⁴

^{1,2,3}Students, B.E. (Electronics), ⁴Associate Prof., Electronics Dept.
PES, C. O. E. Phaltan

Abstract: agriculture is backbone of India and farmers need advanced knowledge to income decisions like digging, seed sowing, and fertilizer dispensing, etc., so that we can get high yield. This plan measures the amount of nitrogen (n), phosphorus (p) and potassium (k) in soil and displays the contents of nap on LCD. According to condition dispense the fertilizer in soil. This project reduces the human efforts and manpower essential for doing this. The nap contents in soil can stand measured by adding solution into it and comparing it with color chart. Nek are mainly required in soil and their contents must be in exact amount in soil. If they will become greater or less, it will right affect the growth of crop. For this our system first kinds the hollow on the land, after that automatically dispenses the main fertilizers according to speed of dc motor.

Keywords: colour sensor, nap kit, arm 7 controllers.

I. INTRODUCTION

The base of Indian cheap is agriculture and still it is done in old-style way. There is need to substitute it by advanced method to improve the performance and take high yield. The technics which are chosen by farmers are time uncontrollable, compulsory large amount of manpower and are done in unsuitable way, which affects the quality of soil, quality of crop and amount of income.as the lands are undeveloped lands are reducing day by day, So we have to replace this old-style way of farming which will help to grow more crops in small parts. Now a days working, seed sowing and tunneling is done by using advanced system but still fertilizers are distribute in accidental way. Due to this the quality of soil reduces and it affects growth of plants, quality of crop as well.

The main problems in Indian farming technic are time uncontrollable high man power absence of knowledge no proper resource use. India is developing very fast in computerization industry but in agricultural field, old and manual technics are used. As agriculture have enormous impact on Indian inexpensive. There is essential of advanced technics.as day by day the populace is increasing; food source should be increased according to that. The important components of soil are nitrogen, phosphorous and potassium. They should be present in appropriate amount in soil. If they become less or greater, it will not good for crop development. Hence for appropriate spreading of fertilizers, this system idea is developed.

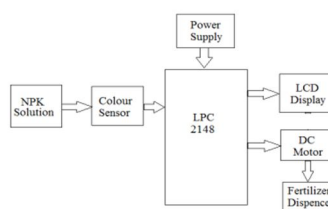
Now a day soil is verified in laboratory and correct analysis of soil is done and amount of various covers and their ratio are measured but laboratories are generally in district places and it is slight bit time consuming process. This proposed system donates to give contain of NPK in soil within some minutes.

A. N (Nitrogen) - for development of plants and vegetation.

B. P (Phosphorus)-for root and growth.

C. K (Potassium)-parameter of water and nutrient in plant cell, highpoint, fruits.

II. BLOCK DIAGRAM



International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Fig. 1 Block Diagram of NPK soil measurements and automatic fertilizer dispense.

The under fig.1.shows the block diagram of NPK Soil Measurement and Automatic Fertilizer Distribute. It contains one colour sensor that is sunroom 1185,NPK solution consist of soil pulse substances, LPC 2148 (ARM 7)controller, Dc motor, LCD display for displaying NPK values.

A. Color Sensor

A green field NPK measurement kit heads the color sensor. It gives blue, gray or pink color at its output dependent on the fertilizer being tested-whether it is nitrogen, phosphorus or potassium. The color sensor will sense this color and convert it into an electrical signal i.e. it will act as a transducer.

This color sensor recognizes color and gives serial output of RGB value. It can identify 16.7 million color shadows giving RGB value for the detected color. The detected color is recognized as amount of three primary color values namely Red, Green, and Blue with 8 bit exactness for each primary color. Any color can be separated or joint into three primary colors Red, Green and Blue using the RGB values.

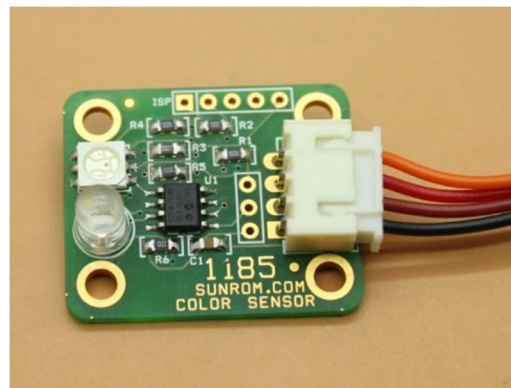


Fig 2 SUNROM 1185 colour sensor

B. LCD Display

LCD stands for liquid crystal display. It is used in this circuit to show the amount of fertilizers in the soil so that we can check whether the amount of fertilizer being distributed is correct or no. We are successful to use a 16x2 LCD i.e. it has 16 characters and 2 lines of display size. The LCD collects control signal from the microcontroller; it decodes that control signal and performs the equivalent actions on LCD. Once the initialization arrangement is done, it displays the soil parameters. It is used to display the quantity of fertilizers in the soil.

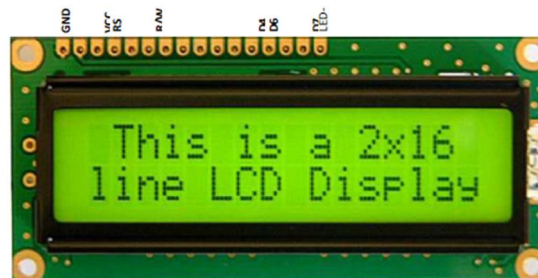


Fig 3. LCD Display

C. Microcontroller (ARM7) LPC 2148

It is a Integrated Circuit mark which processes the input data according to the definite programm and gives the required output. ARM7 used is LPC2138/48 works at 11.05MHz. It theaters an important role, it processes the data received by colour sensor and equal data with the data which is already deposited in controller according to the sensor output signal. It controls all the peripherals on the source of the input from the colour sensor. Dependent on the input from the color sensor, the microcontroller are interface with

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

DC motor.



Fig.4 LPC 2148

D. Features of ARM7

- 1) 8 to 40 kB of on-chip stationary RAM
- 2) 32 to 512 kB of on-chip load program memory.
- 3) Power saving modes contain idle and Power-down.
- 4) Single 10-bit D/A converter deliver variable analog output.
- 5) Up to nine edge or level searching external interrupt pins available.

E. Relay

The relay is an automatic defensive and switching device which is capable of sensing irregular conditions in electrical circuits. These are operated to open or close the load relations in response to one or more electrical numbers like voltage and current. Relay are used in a wide selection of applications like electric power systems, home appliances, automobiles, industrial equipment's, digital computers, etc.

Relays are classified into numerous types based on their functionality and application they are applied for. These classifications comprise electromagnetic, solid state, high voltage, thermal relays, and so on according to their applications.



Fig.5 Relay

III. WORKING PRINCIPLE

The soil sample is occupied from the farm, the correct amount of water is added and sample and solution is made. The sample water is recognized with some compounds like calcium sulfate, Nitrite, sodium molydate, pyro sulfate. Which are present in NPK measurement kit. The colour sensor will intellect the solution colour and give input to the controller, the controller will take suitable valve according to the pre-stored colour chart in it, then that value will be showed on LCD. The important work is of providing proper amount of fertilizers in field. For this the resultant value of evaluation is taken in to consideration and with the help of Dc motor planning fertilizers are dispensed in the soil. The opening and closing of the valve is controlled by motor which is linked to shaft of valve. The dispensing of fertilizer is done on the unit base system.

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

IV. FUTURE SCOPE

The main challenge of this recommended system is dispensing the proper amount of NPK in soil but, will also added automatic seeding. In the next of part of the system is the agroponic system will be developed. Also we use this system for measurement of temperature and humidity.

V. OBJECTIVE

The main objective of this system is textbook utilization of resources and to reduce worker. It can perform many tasks like Soil Testing, Humidity Testing, Temperature Testing, Scattering Of Fertilizers etc. It can measure the NPK content of soil using colour difficult of chemical solution and dispense the required amount of fertilizers which is essential or less in soil.

VI. CONCLUSION

By implementing this system, the excellence of soil can be preserved by proper use of fertilizers which will helps in high income. Also this project used in the field of agriculture we can help growers in the initial stage of agriculture i.e., during seeding and fertilizing.

VII. ACKNOWLEDGMENT

Today on accomplishment of this project report, the persons we need to thank the most who have facilitated us throughout the making of this report and without whose help it would not have seen the light of the day.

Primarily, we submit our appreciation and genuine thanks to our guide and head of department Prof. A. A. Ranaware, for their constant inspiration and support during the progression of the work in the last six month. We truly appreciate and value their respected guidance and encouragement from the establishment to the end of this work.

We would like to thank our principal Dr. M. K. Phadatare who encouraged us and formed a healthy environment for all of us to learn in best possible way.

REFERENCES

- [1] An Automated Agricultural Robot Lento Vedpathak, Pooja Salape, Snail Naik International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 3, March 2015.
- [2] Nishant Singh and Dr. A. D. shaligram "NPK measurement in soil and automatic soil fertilizer dispensing robot International journal of Engineering Research and Technology ISSN: 2278-0181 Vol.3 Issue 7, July-2014.
- [3] Green Growth Management by Using Arm Controller, B Yogesh Ramdas et al Int. Journal of Engineering Research and Applications ISSN : 2248-9622, Vol. 4, Issue 3(Version 1), March 2014, pp.360-363.
- [4] Determination of Major Nutrients (N, P, K) of Soil by İlknur ŞEN," Kaleidoscope Academic Conference September, 2003.
- [5] Close-up of lettuce and wheat grown in an aerologic apparatus, NASA, 1998.
- [6] D.S.Suresh, Yoshi Parkas K V, Rajendra C J, "Automated Soil Testing Device", ITSJ Transactions on Electrical and Electronics Engineering (ITSJ-TEEE) ISSN (PRINT) : 2320 – 8945, Volume - 1, Issue -5, 2013.
- [7] Soil Testing in India", Department of Agriculture & Co-operation, Ministry of Agriculture, Government of India, New Delhi, January, 2011
- [8] Sneak J. Bansod, Shubhadha Thakre, "Near Infrared Spectroscopy based Soil Nitrogen measurement", International Journal of Current Engineering and Technology E-ISSN 2277 – 4106, P-ISSN 2347 – 5161.
- [9] Jinan Lin, Mahout Wang*, Miao Zhang, Yane Zhang, Li Chen, Electrochemical sensors For Soil Nutrient Detection: Opportunity and Challenge, pp 1362-
- [10] Ms Yogita Kulkarni, Dr. Krishna K. Warhade, Dr. SusheelKumar Bahekar, (May 2014) Primary Nutrients Determination in the Soil Using UV Spectroscopy, International Journal of Emerging Engineering Research and Technology Volume 2, Issue 2, pp 198-204.



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)