Automated Crop Irrigation System

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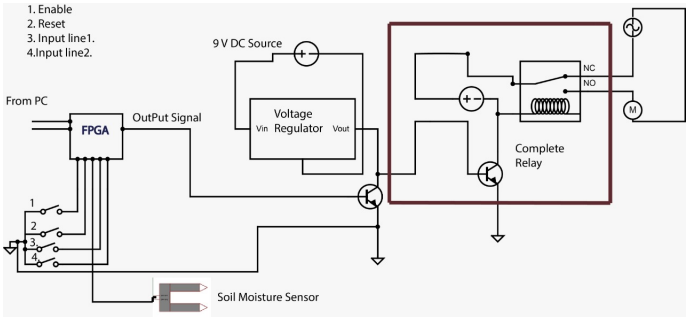
Introduction

One of the major difficulties faced by farmers is irrigation at the appropriate time intervals. To overcome this, we are designing a system which detects the moisture level in the soil and waters the plant whenever necessary and additionally, when the moisture level of the soil detected by the soil moisture sensor goes below a desired level, Our System is activated which in turn waters the plant crop.The user has to select the type of crop that has been planted and our system accordingly extracts information about the required amount of water for that crop from our memory element, processes it, and the motor is then switched on for the required time.

System Overview

For storing the values of the time intervals for which the motor should remain on of various crops, we made a state machine consisting of 4 states. The user can select which crop has been planted and the corresponding time interval is obtained as our output.



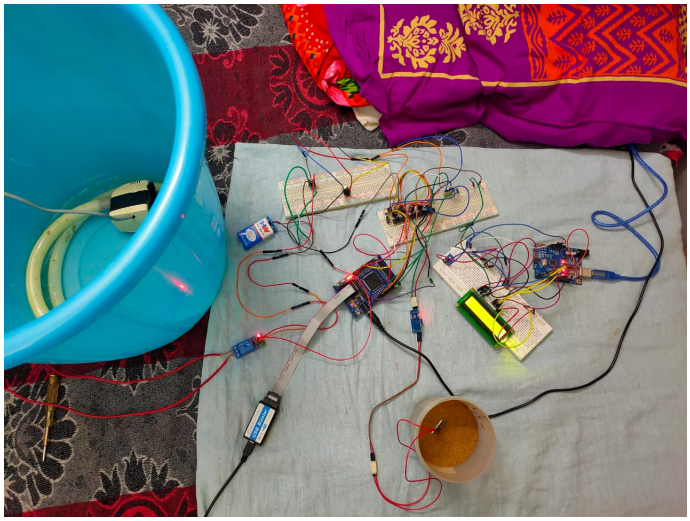
Circuit Diagram.

Implementation Details

First, the user has to select the crop that has been planted by giving the system physical input through 2 switches. Then another switch has to be turned on which allows the sensor signal to be passed on to the FPGA. Now our irrigation system is functional. As soon as the soil moisture sensor sends a signal to the board, depending on the crop planted, the motor is switched on for the necessary amount of time controlled by a counter. Theres a reset switch too, which when turned on, resets all the counters to zero.

Results

A lot of practical problems that we didnt think of, arose while implementing the idea and learnt from them. We were able to make irrigation automated according to our proposal.



Conclusion

We developed a simple automated irrigation system. With some additional functionality and appropriate physical components, this model can be used in real world scenarios. We thank our professor Dr. Nandakumar Nambath for giving us the opportunity to make our first working project in our engineering degree

References

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