

FINAL YEAR PROJECT REPORT

AUTOMATION OF HIGH EFFICIENCY IRRIGATION METHOD
WITH DATA LOGGING



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DEDICATION

Dedicated to *ALLAH AL-MIGHTY* who blessed us with the ability to understand his knowledge to serve this world and then to our parents, teachers, friends and all those who supported us in our life, study and completing this project.

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UNDERTAKING

We hereby declare that this submission is our own work. To the best of our knowledge it includes no material formerly published or written by another person or considerable proportions of material which have been accepted for the award of any other degree or any other educational institution apart from where due acknowledgement is made in the report. Any input made to the research by others with whom I have worked at University of Management and Technology or elsewhere, is explicitly acknowledged in the report. We also declare that the rational content of this report is the product of our own work except to the extents that help from others in the project design and beginning or in style, presentation and linguistic expression is acknowledged.

Group Mates' Signatures

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ABSTRACT

The project is designed to develop an automatic operation of a high efficiency irrigation system which is drip irrigation system. The designed system is configured to drive the watering pump functioning i.e. when to switch on when to switch off. All this is done in accordance to the data values evaluated by our sensor network that comprises of soil moisture sensors, temperature sensor, humidity sensor and rain sensing pad. In the field of agriculture, the use of appropriate irrigation method is very important. The advantage of using this method is to reduce water losses, energy consumption, human intervention and still ensure proper watering.

The project uses a PIC18F452 microcontroller that is programmed to receive the input signal of varying conditions of soil moisture, rain, humidity and temperature through the sensing arrangement. This is achieved by an operational amplifier comparator which interfaces between the sensing arrangement and the microcontroller and is integrated into

the sensor structures.

Once the controller receives the signal of current environmental conditions, it generates an output to tackle the situation by comparing the pre-set point values and the current values. After the analysis of the runtime values the controller decides whether to switch on the pump or not through the relay circuit. An LCD screen is also interfaced with microcontroller to show the status of soil moisture, rain, humidity and temperature. The sensing arrangement is made by using soil moisture sensors placed in different positions on the soil.

Whole values given by all sensors are also saved after regular fixed intervals, for recording and analysing data. Which can be seen any time you want to observe by using the 4*4 keypad.

The concept in the future can be improved by integrating GSM technology, so that each time the water pump switched ON / OFF, an SMS is delivered to the person in question regarding the status of the pump. We can also control the pump via SMS.

And also by the introduction of the use of solar energy in this project, a far more energy and water efficient system can be designed to contribute in the economic development of a country like Pakistan where agriculture is considered as a backbone of economy.