

## **MICROCONTROLLER BASED AUTOMATIC DRIP IRRIGATION SYSTEM FOR VEGETABLE GARDEN**

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### **Executive Summary**

A microcontroller-based device has been designed and developed which automatically controls the irrigation system based on soil moisture. It is commonly known that drip irrigation is incredibly cost-effective and efficient. The irrigation has been made fully automated as part of the project. This concept uses inexpensive sensors and simple circuitry to create a low-cost device that will be beneficial for indoor planting and roof top garden. Third-world nations may also afford to use this simplistic, inexpensive irrigation system to get decent crop yields. The ARDUINO UNO microcontroller serves as the project's heart. Different sensors like temperature and moisture has been used to automatically identify when the irrigation will be required and a solenoid valve controls the irrigation amount. An LCD has been connected with the microcontroller which displays moisture level and ambient temperature. There are pushbuttons available to establish the moisture thresholds for turning on the solenoid valve that regulates the water flow to the field. For data logging and analysis, the SD card receives regular transmissions of the soil moisture and temperature conditions. A well-designed PCB circuit board has been developed to hold all the PCB components. To hold the ARDUINO microcontroller, PCB board, LCD display and overall parts make an automatic device. The whole device has been tested successfully in five pot based tomato plant and all necessary data has been recorded. The water saving in automatic device-based drip irrigation is 35% and the yield increased by 20% compared to manual drip irrigation, it would suggest that automatic drip irrigation is a more efficient method for irrigating crops.

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