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Automatic irrigation system design

The temperature and soil moisture sensors are attached to the soil using probes in order to get the temperature values and soil moisture content from the soil. Data gotten from the sensors every two minutes is converted to signals to be sent to the microcontroller unit, the microcontroller unit collects the data sent and processes it by checking whether the obtained values are then compared with the predefined values that have been programmed unto the microcontroller unit. Therefore the obtained values could either be higher or lower than the predefined values in the case of the former, the microcontroller sends signals to the relay to turn on the sprinkler system to run, while in the case of the latter the sensors keep reading the temperature and the moisture content of the soil.

The automatic irrigation is protected using a fence that is installed with access control. This is to ensure the security of the pumps and other equipments by allowing only authorized persons. Persons can only gain access to equipment if they key in the correct password using a keypad by the entrance of the fence

SOFTWARE FEAUTURES

Smart scheduling- smart irrigation can create and automate irrigation schedules for specific zones using a timer and data from sensors

Notifications- getting alerts from water leaks, bad zone leaks clogs, delayed scheduled etc. such alerts enable users to take the appropriate action to avoid shortcomings

Dashboard- helps users view information about the weather, water usage scheduled runs and other important parameters

Hardware Features:

i) Reservoir tank: this is the storage medium for the water to be used for irrigation

ii) Sprinklers: used for applying water in a controlled manner.

iii) Reservoir pumps: used for moving water in order to fill up the reservoir tank.

v) Microcontroller unit: receives the input from the sensors and also govern the entire irrigation process.

vi) Sensors:

- Soil moisture sensors: these measure the volumetric water content of the soil.
- Temperature sensors: these measure the temperature of the environment and convert the input data to electronic data

Algorithm:

Step 1: Start

Step 2: Sensors read and send the data from the soil as signals

Step 3: Microcontroller collects data sent from the sensors

Step 4: Microcontroller analyses the data by comparing the values sent against the pre-defined values

Step 5: If the values obtained are greater than the pre-defined values

-Go back to step 2

Else

-Send signals to the sprinklers to be turned on

Step 6: End

THE FLOWCHART