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The Software developed for temperature of the soil, moisture control of the soil, time interval of the water system is to be worthy as Computerized Smart Irrigation Controller and Sensor.

The Smart Irrigation Controller and Sensors have been developed to reduce outdoor water use by Irrigation based on plant water need compared to traditional automated system.

The Smart Irrigation Controller & Sensors is Incorporated with COMETRO Radiation Shield for determining the temperature of the soil also known as Evapotranspiration (ET) Controller use local weather data to adjust irrigation schedules. Evapotranspiration uses a meteorological data on site measurement Controller use weather data collected on site and the ET data is sent to the Controller by a wireless connection.

The Soil moisture Sensor Controller, instead of using weather data, it utilize a Soil moisture Sensor placed below ground in the root zone of the plant to determine water needed. The Soil moisture Sensor estimate the soil volumetric water content. The volumetric water content represents the portion of the total volume of soil occupied by water. The Controller can be adjusted to open the valves and start irrigation once the volumetric water content reaches a user defined threshold.

The appropriate threshold value depends on soil and vegetation type and usually ranges from 6% to 40%. The soil moisture Controller has been

Smart Sprinkler Controller  
Once the Sprinkler is going to on and, the (M Guard (M200) Sensor combined with a magnetic contact that covers the ferris - The ferris will simply receive a phone call when its time to move the Sprinkler installation.

The cm2000 guard sends a message to a microcontroller at the pump, to automatically turn it off. This prevents the land getting too wet.

## Hardware and Software Features

### Hardware Features

- (i) Evapotranspiration Controller - is used to determine the weather condition, temperature, R-T-C
- (ii) Soil moisture sensors - It is used to estimate the soil volumetric water content
- (iii) Monitor - It is used to display the graphical user interface
- (iv) Pump - It is used to transfer water from the river, channel into the
- (v) Keyboard - for the input of the range of temperature, soil moisture, time duration before irrigation

### Software Features

- (i) Graphical user interface - The tool on the monitor that acts as communication between the program and the operators.
- (ii) Mobile App - it helps to control and monitor the sprinkler system
- (iii) Dashboard - A streamlined dashboard helps users view information about the weather, water usage, tank level, time interval, etc.

### 3 Algorithm and Flowchart

Step 1: Start

Step 2: ~~Read~~ Temperature, Moisture level, water level, Time  
alarm = 0

Step 3 Read Temperature  
If Temp ~~> 50~~ If Temp > 50  
~~Turn on pump to irrigate~~  
Else  
pump remains turn off

Step 4 Read Moisture level  
If M.L < Threshold 40%  
Turn on pump to irrigate  
Else  
pump remains turn off

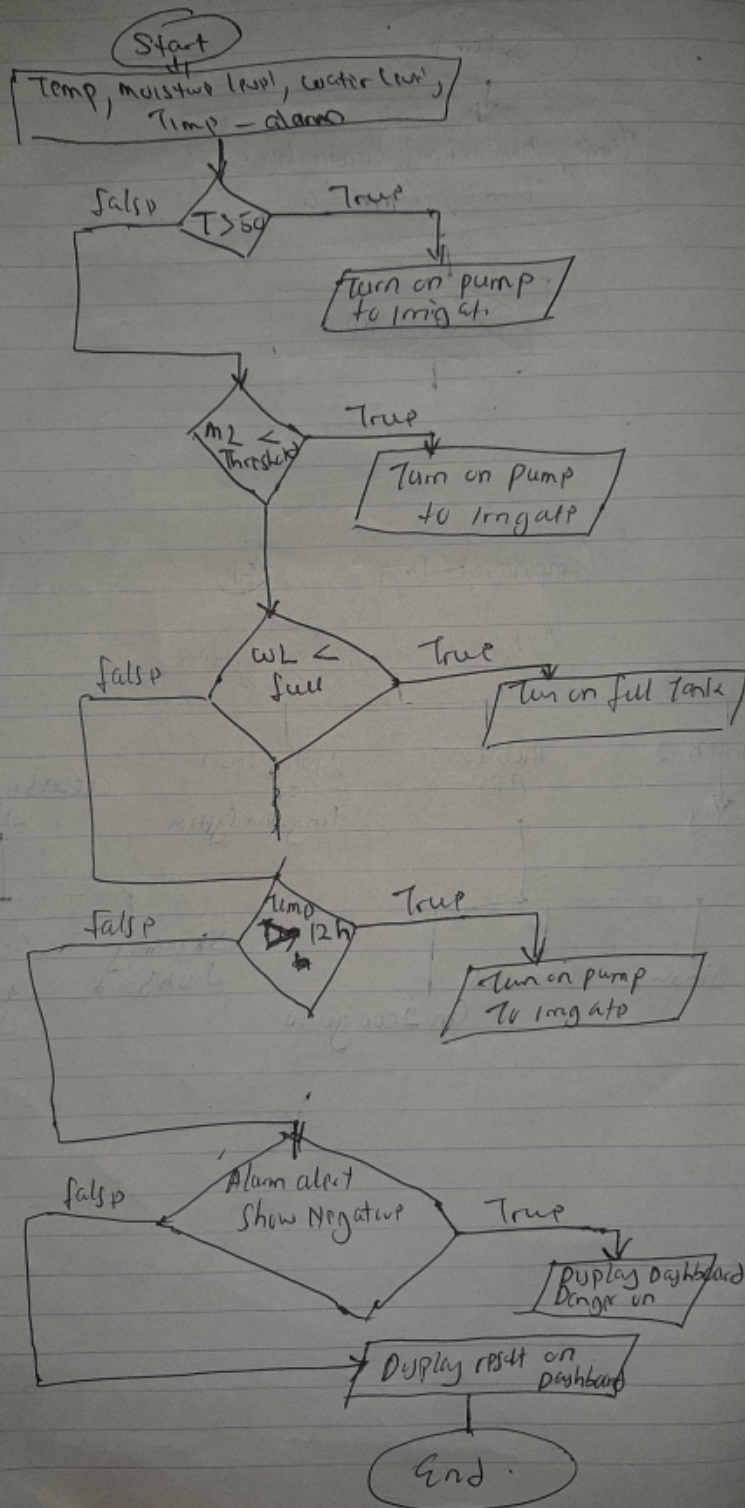
Step 5 Read water level  
If W.L < Full - turn on ~~pump~~ fill tank  
Else  
turn off ~~Don't~~ fill tank

Step 6: Read Time in Hours  
If <sup>after</sup> irrigation exceeds 12 hours  
Turn on pump to irrigate  
Else  
pump remains turn off.

Step 7 Read Alarm alert  
If tank > full  
Display danger on dashboard (positive)  
Else  
Negative (No danger)

Step 8 - uploading result to dashboard

Step 9 - end.



Computerized Irrigation (4)

### Automated Irrigation System

