

INTELLIGENT AUTOMATIC PLANT IRRIGATION SYSTEM

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1. INTRODUCTION

Irrigation is the key to a successful garden. Long gone are the days of manual watering or relying on a friend to water when you are on vocation or away on business. The project presented here waters your plants regularly when you are out for vocation .the circuit comprises sensor parts built using op-amp LM324. Op-amp is configured here as a comparator. Two stiff copper wires are inserted in the soil to sense the weather the soil is wet or dry .The comparator monitors the sensor and when sensor sense the dry condition then the project will switch on the motor and it will switch off the motor when sensor is wet.the comparator does the above job it reciees the signals from the sensors.

To arrange the circuit,insert copper wires in the soil to a depth of about 2cms,keeping them 3cms apart. for small areas a small pump such as the one used in air coolersis able to pump enough water

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with in 5 to 6 seconds.the timing components for the timer are selected accordingly. The timing can be varied with the help of preset voltage .

The circuit is more effective indoors if one intends to use it for long periods. This is because the water from reservoir(bucket, etc) evaporates rapidly if it is kept in the open. For regulating the flow of water, either a tap can be used or one end of a rubber pipe can be blocked using M-seal compound, with holes punctured along its length to water several plants.

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2. List of Components:

R1, R2 _____ 10k Ω resistors

R3 _____ 220 Ω Resister

C1 _____ 100 μ F Capacitor

C2 _____ 0.1 μ F Capacitor

D _____ IN4007

LED _____ Light Emitting Diode

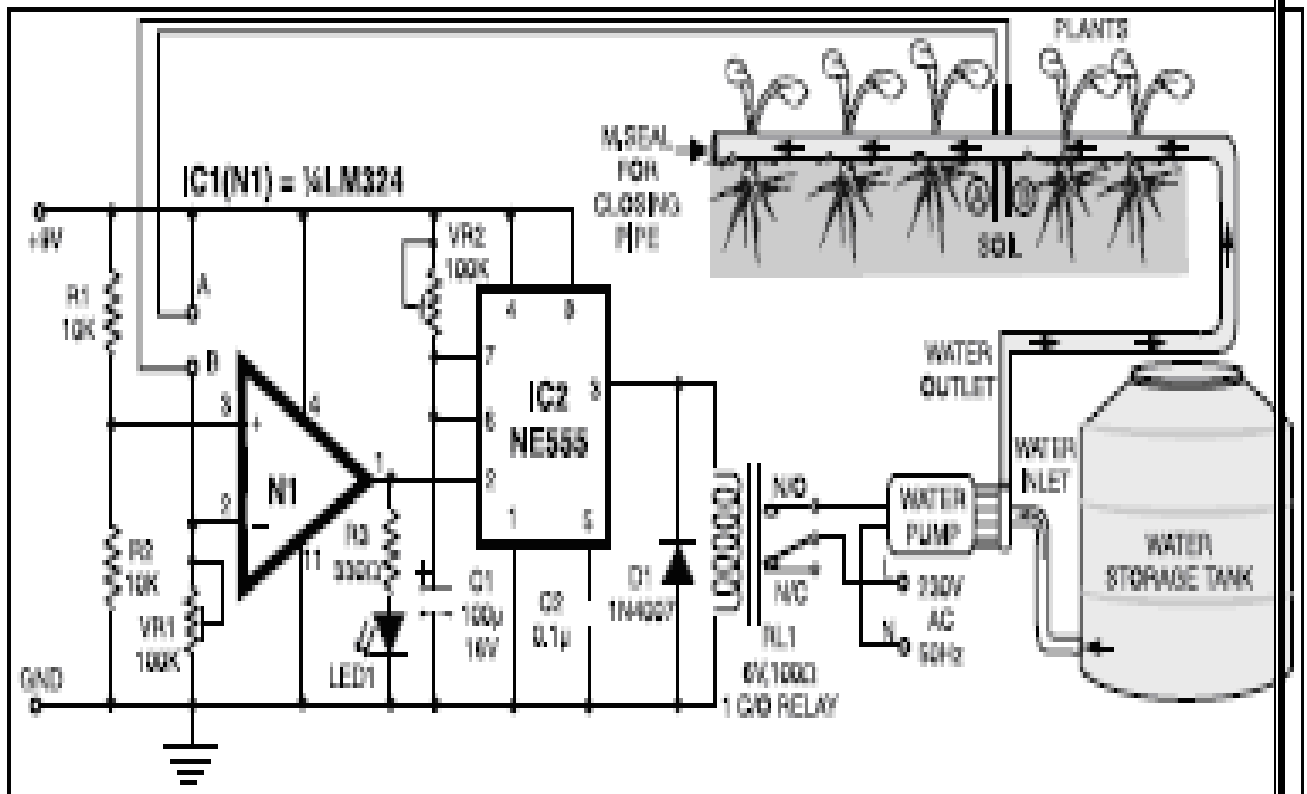
IC1 _____ LM324 Quad op-amp

IC2 _____ NE555 IC Timer

RL1 _____ relay

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3. Circuit diagram



4. Circuit operation:

When the soil dries out, the resistance between the copper wires (sensor probes A and B) increases. If the resistance increases beyond a preset limit, output pin 1 of op amp N1 goes low. This triggers the timer IC2 (NE555) configured as a monostable multivibrator. As a result relay RL1 is activated for preset time the water pump starts immediately to supply water to the plants. As soon as the soil becomes sufficiently wet, the resistance between sensor probes decreases rapidly. This causes pin 1 of op-amp N1 to go 'high'. LED1 glows to indicate the presence of adequate water in the soil. The threshold point at which the output of op-amp N1 goes 'low' can be changed with the help of preset VR1

6. Advantages:

- Highly sensitive
- Works according to the soil condition
- Fit and Forget system
- Low cost and reliable circuit
- Complete elimination of manpower
- Can handle heavy loads up to 7A
- System can be switched into manual mode whenever required

7. Applications:

- Roof Gardens
- Lawns
- Agriculture Lands
- Home Gardens

7. Conclusion:

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8. Bibliography:

- [http:// www.electronics-manufacturers.com](http://www.electronics-manufacturers.com)
- <http://www.datasheetcatalog.org>
- <http://www.wikipedia.com>
- www.kpsec.freeuk.com
- Principles of electronics by V.K.Mehta
- www.google.com
- Basic electronics by Boylested