Automatic irrigation system

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ABSTRACT

- Abstraction or diversion of water using ditches, pipes, and streams for irrigation is a popular method of turning unproductive and/or dry areas of land into productive agricultural enterprises. This paper deals with an automatic plant irrigation system which automatically senses the moisture content of the soil and decide whether irrigation is needed or not and how much water is needed for soil

- The user will be able to switch ON and OFF the irrigation system. Irrigation in arid areas of the world provides two essential agricultural requirements: (1) a moisture supply for plant growth which also transports essential nutrients; and (2) a flow of water to leach or dilute salts in the soil. The commonly used irrigation methods are surface, sprinkler, and drip irrigation. Each method has its own merits and demerits, depending on the soil, topography, type of crops, climate, water availability and quality, and investment, which are the guiding factors for selecting an adequate irrigation method.

Introduction

- Irrigation is an artificial application of watering the land for agricultural production.
- In this system ,soil moisture sensor senses the moisture level of the soil. If soil will get dry then sensor senses low moisture level and automatically switches on the water pump to supply water to the plant.
- As plant get sufficient water and soil get wet then sensor senses enough moisture in soil. After which the water pump will automatically get stopped.

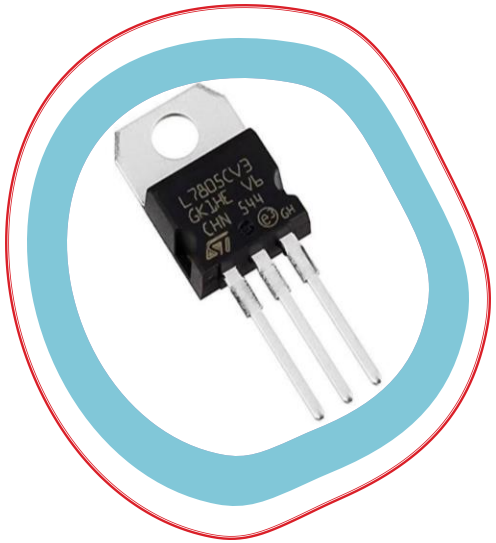
DEFINITION

- Automatic irrigation is the use of a device to operate irrigation structures so the change of flow of water from bays can occur in the absence of the irrigator.

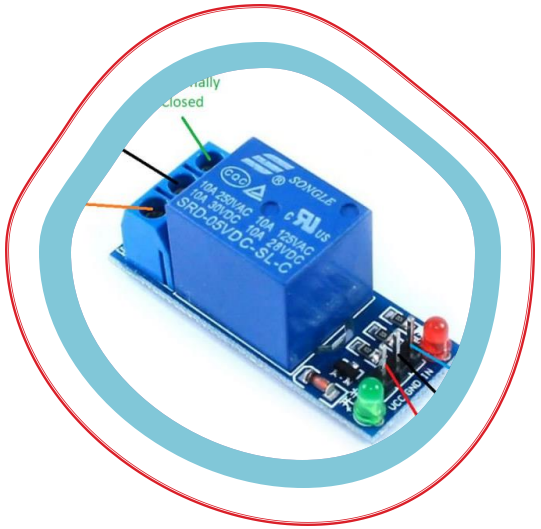
PROBLEMS ON IRRIGATION SYSTEM

- Over irrigation because of poor distribution uniformity or management of waste water , chemicals may lead to water pollution.
- Under irrigation leads to increased soil salinity with consequent buildup of toxic salts on the soil surface in areas with high evaporation.
- Farm Lands and Fields should be situated miles away from your home.
- Extensive travel required,sometimes several times in a day to start and stop the irrigation water pumps.

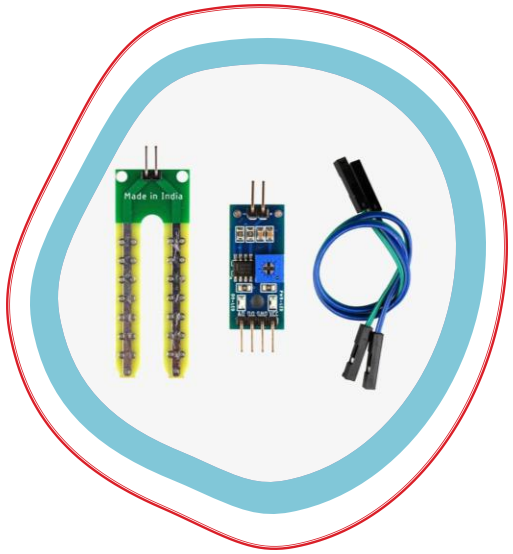
COMPONENTS



7805 Regulator



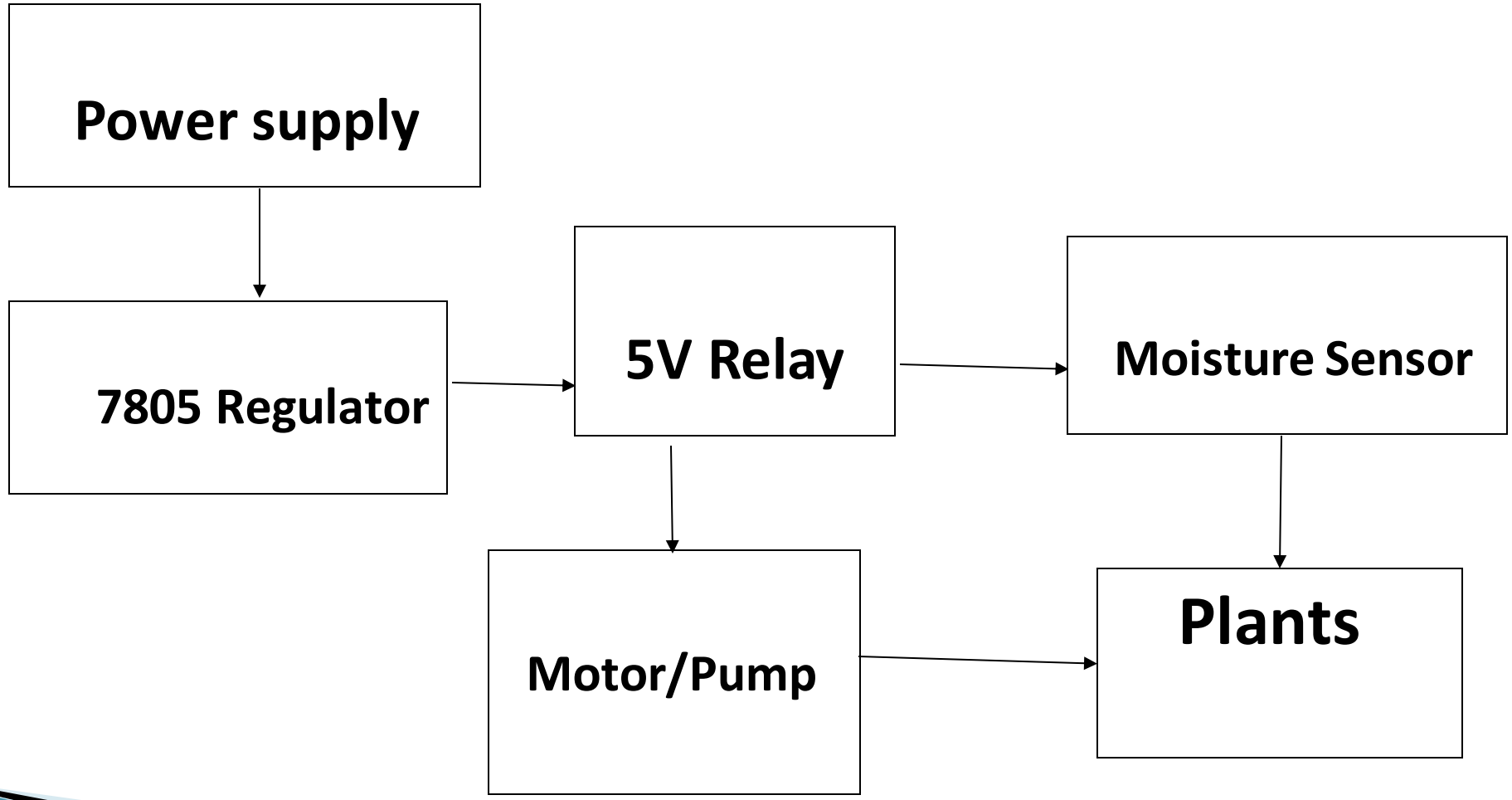
5V Relay



Moisture sensor

DC Pump

BLOCK DIAGRAM



WORKING PRINCIPLE

- The 5V relay module requires a 5V signal delivered from a microcontroller or sensor to trigger the switch. Its working is also very simple. When the input pin is HIGH, the relay turns on, and when the input is LOW it turns off.

- In voltage regulator 7805 IC, a large amount of energy is exhausted in the form of heat. This is because there is a high difference between the input and output voltage which is converted in heat within the regulator IC. Therefore, to dissipate this heat, a heat sink is provided with the voltage regulator IC 7805.

- Soil& moisture sensors uses capacitance to measured the water content.
- Operating temperature is 40 to 60 degree celcius.
- Working principle of soil moisture sensorThe moisture sensor consists of two probes that are used to detect the moisture of the soil. The moisture sensor probes are coated with immersion gold that protects Nickel from oxidation. These two probes are used to pass the current through the soil and then the sensor reads the resistance to get the moisture values.
- DC powered pumps use direct current from motor, battery, or solar power to move fluid in a variety of ways.

ADVANTAGES

- Highly sensitive
- Works according to the soil condition
- Low cost and reliable circuit.
- Complete elimination of manpower.
- System can be switched into manual mode whenever required.
- Reduce wastage of water.

APPLICATION

- Irrigation in fields.
- Irrigation in garden, parks.
- Very useful for people who do not have time to water their plants because of busy life schedule .
- The project is very economical in terms of cost and power.

CONCLUSION

- In present days especially farmers are facing major problems in watering their agriculture fieds.it's because they have no proper idea about when the power is available so that they can pump water.
- Even after then they need to wait until the field is properly watered , which makes them to stop other activities.
- Here is an idea which helps not only farmers even for watering gardens also which senses soil moisture and switches the valve automatically when the power is ON.
- So automatic watering system is very useful.

REFERENCE

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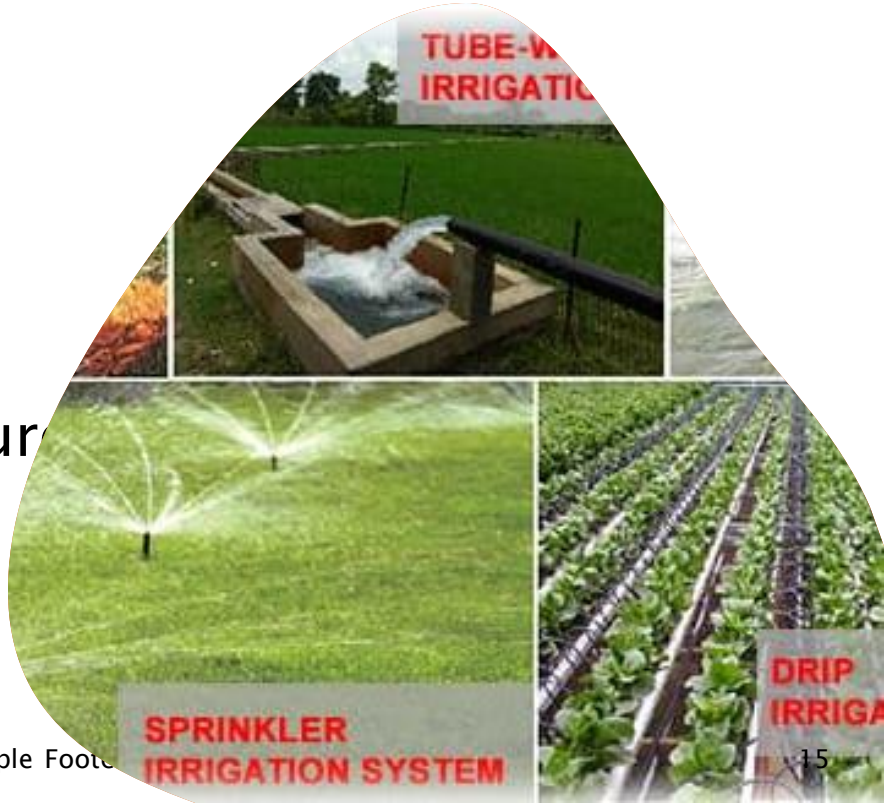

Thank You