Automatic plant watering/irrigation system using Arduino Nano

The project aims in designing a smart irrigation system which is capable of detecting moisture level in the soil and capable of taking the decision of switching ON/ OFF water motor automatically using Arduino Nano.

Arduino Nano is based on the ATmega328 SMD chip. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 8 analog inputs, 1 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, and a reset button.

The system makes use of an Arduino Nano microcontroller. Soil moisture sensor, water motor along with relay are interfaced to the Arduino Nano. The microcontroller will continuously compare output from soil moisture sensor. When there is no moisture in soil then microcontroller will turn ON the water motor through relay. There is sufficient water in soil microcontroller will turn OFF the water motor automatically. The Arduino nano is loaded with a program written in embedded 'C' language to perform the task.

Features:

1. Automatic irrigation using soil moisture sensor.

2. Relay switch-based water pump control.

3. Using Arduino Nano to achieve this task.

Main blocks in this project:

- Adapter power supply.

- ARDUINO Nano Microcontroller.

- Relay with Water Motor.

- Soil moisture sensor.

Software's used in this project:

1. Arduino IDE studio compiler.
2. Express SCH for Circuit Design.
3. Embedded C language.

Block diagram:

Automatic Irrigation System

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                    ┌──────────────────────────┐
                    │  Regulated power supply   │
                    └────────────┬─────────────┘
                                 │
                                 ▼
┌────────────────────┐   ┌──────────────┐
│ Soil Moisture sensor├──▶│              │
└────────────────────┘   │              │    ┌──────────┐   ┌────────────┐
                         │   Arduino    ├───▶│  Relay   ├──▶│  AC water  │
                         │    nano      │    │  driver  │   │   motor    │
                         │              │    └──────────┘   └────────────┘
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```