

IoT Based Irrigation, Monitoring & Controlling System using Blynk app

<https://www.youtube.com/watch?v=CRaLmPJi5Zw>

The proposed IoT-based Smart Irrigation System is designed to automate and efficiently manage agricultural irrigation while reducing water wastage and manual effort. The system uses a NodeMCU microcontroller as the main control unit, interfaced with soil moisture sensors and a DHT11 temperature and humidity sensor to continuously monitor soil and environmental conditions. Based on the sensor readings, the NodeMCU automatically controls the water motor through a relay, supplying water only when the soil moisture level is below the required limit. The collected sensor data is transmitted through Wi-Fi to a cloud platform and can be accessed by the farmer using an Android mobile application with a secure login ID. This enables real-time monitoring and remote control of the irrigation system from any location. Since the system consumes very low power, it can also be connected to a mini-UPS to ensure continuous operation during power failures. After the power supply is restored, the system automatically reconnects to the Wi-Fi network and resumes its normal operation without manual intervention. The NodeMCU is programmed using Embedded C through the Arduino IDE, making the system simple, low-cost, reliable, and suitable for agricultural fields of different sizes.

Features:

- ☐ Automatic irrigation based on soil moisture level
- ☐ Real-time monitoring of temperature and humidity using DHT11
- ☐ IoT-based remote monitoring and control
- ☐ Android mobile application interface
- ☐ Wi-Fi connectivity using NodeMCU
- ☐ Automatic water motor ON/OFF control

- ☐ Cloud-based sensor data monitoring
- ☐ Remote access from any location
- ☐ Low power consumption
- ☐ Mini UPS backup for operation during power cuts
- ☐ Automatic Wi-Fi reconnection after power restoration
- ☐ Reduces water wastage and manual effort
- ☐ Low-cost and easy-to-implement system
- ☐ Suitable for agricultural fields of different sizes

The main blocks of this project are:

1. Regulated power supply.
2. Microcontroller (NodeMCU).
3. AC Water Motor with Relay driver.
4. Soil moisture sensor.
5. DHT11.
6. LED.

Software used:

- ARDUINO IDE STUDIO Compiler.
- Express SCH for Circuit design.

BLOCK DIAGRAM

