

# **Solar Intelligent Sprinkler System**





## Overview

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Is a smart irrigation system a cost-effective solar-powered water pump with IoT integration?

The smart irrigation system includes a NodeMCU microcontroller, moisture and temperature/humidity sensors, and a relay board. The main contribution of this study is to design and fabricate a cost-effective solar-powered water pump with IoT integration for the smart irrigation system.

What is a sustainable smart irrigation system?

The project aims to develop a sustainable smart irrigation system (SIS) for the indoor plant irrigation by integrating photovoltaic (PV), internet of things (IoT), and rainwater harvesting techniques. The addressed problem involves the inconsistency and tediousness of manual watering, emphasizing the need for a sustainable design for a SIS.

How does a solar-powered smart irrigation system work?

The flowchart illustrates the operation of a solar-powered smart irrigation system designed to maximize water and energy efficiency. The process begins with a soil moisture sensor monitoring the moisture level in the soil. If the moisture falls below a predefined threshold, the system evaluates the availability of solar energy.

Can a solar-powered portable water pump control IoT-enabled smart irrigation system?

An IoT smart irrigation system (IoT-SIS) is developed to monitor the surroundings and control the pump over the Internet. The IoT-SIS-SPWP system is implemented in a real environment for practical analysis and functionality testing. This paper proposes a solar-powered portable water pump (SPWP) for IoT-enabled smart irrigation system (IoT-SIS).



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Sustainable Smart Irrigation System (SIS) using solar PV with ...

Mar 21, 2025 · The project aims to develop a sustainable smart irrigation system (SIS) for the indoor plant irrigation by integrating photovoltaic (PV), internet of things (IoT), and rainwater ...

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Design and implementation of solar-powered with IoT ...

Jan 1, 2022 · This paper proposes a solar-powered portable water pump (SPWP) for IoT-enabled smart irrigation system (IoT-SIS). A NodeMCU microcontroller with a Wi-Fi interface and soil ...

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Solar Micro-Sprinkler Irrigation Systems for Farmers

Sep 4, 2025 · Solar micro-sprinkler systems can reduce water usage by 30-50% compared to traditional irrigation methods while delivering precise moisture to crop root zones.

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A solar-powered, internet of things (IoT)-controlled water ...

Jan 16, 2025 · Efficient water management is crucial in modern agriculture, especially in regions facing water scarcity. Traditional irrigation systems often result in water wastage, which ...

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Design and Implementation of Solar Powered Automatic Sprinkler

Sep 5, 2022 · The project presents the design and implementation of "Solar Powered Automatic Sprinkler Irrigation System" that irrigates a farm by switching a DC water pump based on the ...

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How to Set Up a Solar Sprinkler Timer for Efficient Irrigation

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Sustainable Smart Irrigation System (SIS) ...

Mar 21, 2025 · The project aims to develop a sustainable smart irrigation system (SIS) for the indoor plant irrigation by integrating photovoltaic ...

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Maximizing energy via solar-powered smart irrigation: An ...

Feb 21, 2024 · Our innovative system harnesses a singular-axis solar tracking mechanism alongside moisture sensors and a water pump relay module, resulting in the creation of an ...

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Design and Implementation of Solar Powered ...

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Design and evaluation of a solar powered smart irrigation system ...



Apr 6, 2025 · Therefore, the study aims to advance sustainable urban agriculture by designing and evaluating a solar-powered smart rooftop irrigation system for peppermint cultivation.

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How to Set Up a Solar Sprinkler Timer for ...

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The Concept and Design of Solar Powered Sprinkler ...

This paper shows the concept and design of a solar-powered automatic sprinkler system with IoT monitoring expected to be applied in plantations and reduce farmer workload in farming ...

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Solar Based Smart Water Sprinkler System

Aug 19, 2023 · The world's most serious socioeconomic issue is a lack of water resources, notably in agriculture, where vast volumes of water are needed. Farmers struggle to maintain ...

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