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Design and development of a PLC-based solar tracking system

Overview

This paper is proposed for a sun tracking system based on LDR sensor using PLC for rotating motor. The paper shows how to develop and implement a single axis solar tracking system with minimum cost.Why should you use Siemens plc for automatic solar tracking?

CPU and the programming tools allow users to design autonomous industrial processes and solve automation problems. Based on this specific application and its user-friendly programming tool and troubleshooting solutions, Siemens' PLC hardware and software were found to be the right fit for the automatic solar tracking application in this project.

What is solar tracker control architecture?

SIMATIC S7-1200 Solar Tracker Control Architecture (Tang, 2014) This process is conducted through the solar tracking and the calculation of the alignment for single axis tracking libraries, depending on whether the system is single or dual axis. The Siemens SPA (Solar Position Algorithm) calculates the azimuth and zenith.

What is a solar tracking system?

This is the true position of the sun as seen from an observer on the surface of the earth. From fig. A solar tracking system refers to a system which is able to track the movement of the sun throughout the day for maximum energy efficiency and have it at a perpendicular angle to the plane of the solar panel.

Can a PLC measure solar energy?

A PLC type s7-200 from Siemens, a Human Machine Interface (HMI), an analog extension module (EM) , a temperature sensor type Pt100 and an inexpensive system for measuring solar radiation and applications of solar energy [8, 9,10] were used in this simulation. .

How accurate is solar tracking?

When in range, the system has a tracking accuracy of ±1°. Data analysis from research shows that even a single axis three-position system can increase efficiency and make solar tracking a worthwhile endeavour. Automated tracking, Linear motors, PLC, Solar tracking, Solar panels.

Can a single axis three-position system improve solar tracking efficiency?

Data analysis from research shows that even a single axis three-position system can increase efficiency and make solar tracking a worthwhile endeavour. Automated tracking, Linear motors, PLC, Solar tracking, Solar panels. Figure 1. Sun vector components in a diurnal circle course of the sun (Prinsloo &

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PLC BASED SOLAR TRACKING SYSTEM

The version described in the thesis implements a Siemens PLC based solution, relying on a tracking algorithm to locate the position of the sun; more specifically, the configuration of the ...

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Design, Construction and Test of a Solar Tracking System ...

The solar tracking system, include a quadrate array of sensor made up of four Light Dependent Resistor, Potentiometer, Servo motors and a Microcontroller. The designed system has a ...

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Design and Implementation of an Automatic Single Axis Solar Tracking System to Enhance the Performance of a Solar Photovoltaic Panel Published in: 2021 International Conference on ...

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Developing a dual axis photoelectric

tracking module using a multi

This study planned and constructed a dual-axis solar programmable logical controller (PLC) based automatic tracking system, as well as its management and signal ...

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(PDF) Optimum Design and Implementation of Stand-alone Tracking

This paper presents the development of an effective approach for design, simulation and control of a Stand-alone Photovoltaic (PV) power system elements which are; proposed solar tracking ...

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A simple and low-cost active dual-axis solar tracker

This paper presents the design, implementation, and test of a low-cost smart active dual-axis solar tracker (DAST). The proposed active DAST ...

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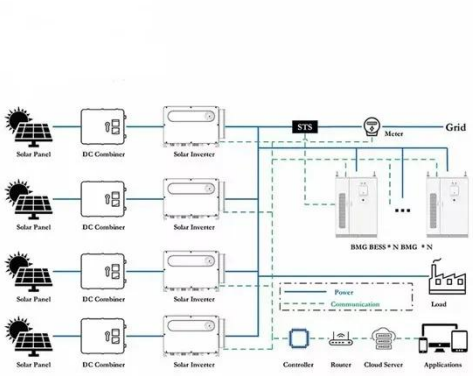

PLC Based Solar Tracking System

The target of this project was to establish a solar tracking system with programmable logic controller as its

controlling unit. More specifically this project concerned the programming of ...

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Solar tracking control system based on PLC

This paper presents the design and implementation of an experimental study of a two-axis (Azimuth and Altitude) automatic control solar tracking system to measure the solar radiation ...

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Design of an intelligent solar tracking system based on PLC

In order to solve the problem of low photoelectric conversion efficiency in solar power generation, a solar photovoltaic power tracking system based on PLC is proposed.

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In this paper, automatic solar tracking system is implemented using PLC which tracks the sun more effectively with its simple and precise control structure in

all environmental conditions. ...

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Review of dual axis solar tracking and development of its functional

Secondly, from the above review, a generic functional model of how an efficient and effective tracking system should be is presented. The two components, coevolving, shall be ...

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(PDF) Dual Axis Solar Tracking System Using PLC

To increase the photovoltaic panel efficiency a dual axis solar tracking system is designed and used to track the sun position. The Siemens ...

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(PDF) Automatic solar tracking system using DELTA ...

In this paper, automatic solar tracking system is implemented using DELTA PLC which tracks the sun more effectively with its simple and precise ...

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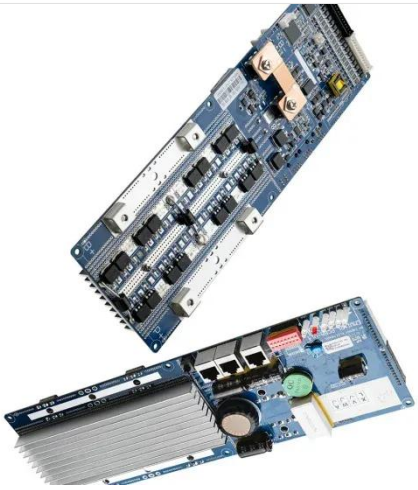

Design of Single Axis Solar Tracking System Using PLC

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Design and Development of an Automated Multi Axis Solar Tracker Using PLC

Design of a two dimensional automated solar tracking system is discussed in this

paper. The objectives of the proposed work are to design an automated tracking technique using Light ...

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PLC Based Solar Tracking System

The target of this project was to establish a solar tracking system with programmable logic controller as its controlling unit. More specifically this ...

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PLC Based Solar Tracking System

The circuit and the mechanism explained in this article may be considered as the easiest and perfect dual axis solar tracker system.The device is able to track the daytime motion of the sun ...

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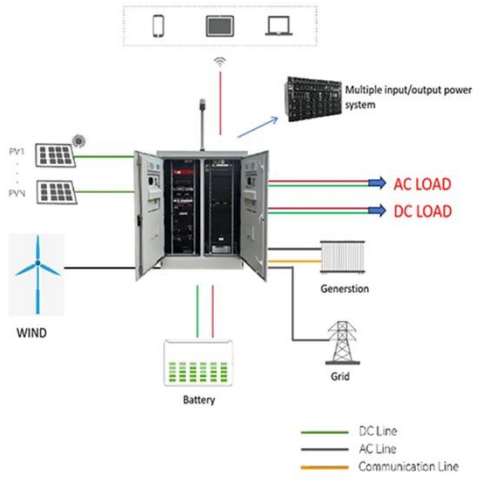

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Design and Implementation of Single Axis Solar Tracking System

In this study, the design and implementation of a polar single-axis tracking system is presented to improve the energy efficiency of PV system through angular variation during the ...

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This paper concentrates on the development of a closed-loop tracking of the sun that precisely follows the sun's trajectory, allowing photovoltaic panels to capture the ...

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Review on sun tracking technology in solar PV system

This paper begins with a brief introduction to the solar PV cells and the materials used in their construction. It

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PLC based Solar Panel Tracking System with Automatic ...

This paper presents a new design of a Three-axis solar tracking system which is based on Programmable Logic Controller (PLC). The automatic tracking system of solar radiation is ...

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Design and Implementation of PLC-Based Automatic Sun ...

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Development of Dual Axis Solar Tracker with IoT Monitoring ...

al controller (PLC) based on automatic tracking system. The function of PLC in this research is to control the movement of solar tracker. In paper [12-13], the

researcher had compared the dual ...

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