

How to increase photovoltaic panel efficiency?

To increase the efficiency of photovoltaic panels, a dual axis solar tracking system is designed and used. This system is used to track the sun's position. The Siemens S7-1214 DC/DC/DC PLC is employed to control the dual axis solar tracking system's rotation.

How a solar tracking system enlarges the output power of a photovoltaic panel?

A solar tracking system enlarges the output power of a photovoltaic panel by 39.27%. Four Light Dependent Resistors (LDRs) are used to detect the sun position in the sky, allowing the tracking system to follow it and make the solar radiation perpendicular on the photovoltaic panel surface. The proposed approach is compared to a fixed panel system in the study.

Does a dual axis tracking photovoltaic system increase electricity?

One such research project conducted and published in Turkey, draws a parallel between dual axis tracking and fixed systems, determining that there is a 30.79% increase in the electricity obtained from the dual axis tracking photovoltaic system compared to the fixed photovoltaic system.

How does a PLC work?

The motors' feedback system went through the voltage regulators to lower the voltage from 0-24VDC to under 0-10VDC and links to the PLC's analog input connection. The CPU was fed 240VAC from either a power supply or an outlet, and it was converted to 24VDC. This supplied power to the switch module and the HMI screen.

How does a PLC control a motor?

Similarly, the other two relay switches controlled the flow of electricity from the power supply to the motors and are activated by the PLC. The motors' feedback system went through the voltage regulators to lower the voltage from 0-24VDC to under 0-10VDC and links to the PLC's analog input connection.

What is a S7 PLC?

Figure 44. Figure 45. The system's control unit was the S7 PLC, the switch module acted as a gateway for the PLC to PC and PLC to HMI connection via an ethernet cable. The motors had five wires, two of which were power wires connected to the power supply after passing through relay switches.

A. Nataranjan et al. (2016) proposed a design of Programmable Logic Controller (PLC) solar panel tilting system. From this concept a uniform and higher power generation can be obtained when ...

solar PV panel according to the direction of the beam propagation of the solar radiation from dawn to dusk. The designed tracking system consists of four sensors (LDR) and a programmable ...

V-I characteristics Of the experimental PV panel Panel Current (Amps) 3 2.5 2 1.5 1 0.5 0 0 5 10 15 20 25
Panel Voltage (volts) Fig (9): V-I characteristics of the PV panel used in the ...

So, this paper presents a method for measuring and monitoring the PV panel parameters based on a Programmable Logic Controller (PLC) with a simple design. Terminal voltage, load current, the power dissipated, temperature, and ...

The performance PV standards described in this article, namely IEC 61215(Ed. 2 - 2005) and IEC 61646 (Ed.2 - 2008), set specific test sequences, conditions and requirements for the design ...

This paper presents the design and implementation of a solar panel data monitoring system using a SCADA (Supervisory Control and Data Acquisition) system. The system is built via the ...

current of the PV panel. To use a PV panel in measuring solar radiation, its output current must be calculated as shown in figure (8). Fig. (8): Measuring solar radiation by calculating $I_{s.c}$ of the ...

This thesis proposes a design of a single axis solar tracker with a solar panel on it. This thesis also brings in the use of a switched reluctance stepper motor to ensure accuracy with tracking ...

A Photovoltaic (PV) system needs to monitor individual PV panels to maintain the performance. In a high-dense large-scale PV system, two characteristics can limit the use of communication ...

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