LabVIEW Solar Tracking Control System

What is a virtual instrumentation system based on LabVIEW and Arduino?
This project presents a simple virtual instrument system based on LabVIEW and Arduino to characterize and monitor a PV panel. This project proposes a low-cost real-time virtual instrumentation system based on LabVIEW and Arduino to characterize a PV panel. Also for monitoring its output data (current, voltage, and power) under real condition.

How are the parameters of solar panel measured?
The parameters such as voltage,current,light intensity of solar panel are acquired continuously. Voltage is measured by using voltage divider,current is measured by using acs712 and light dependent resistors (LDR) is used for capturing maximum light source and the acquired data are processed in Arduino and send to LabVIEW.

What software is used to design a solar PV system?
Arduino IDE,LabVIEW,and LIFA are used as the software of the system design. The Figure below shows the schematic diagram of the instrumentation system. The current and voltage sensors sense the output current and voltage from the PV panel. Then,the readings of the two sensors are transmitted to the microcontroller of the Arduino UNO board.

How to send data from Arduino to LabVIEW?
To send data from Arduino to LabVIEW, the LIFA is necessary to make the connection between the Arduino microcontroller and the computer. For this, you just need to follow the following steps: + Install the LabVIEW software (LabVIEW 2011 or later); + Download the NI-VISA drivers and install it.

What is LabVIEW interface for Arduino?
Then,the readings of the two sensors are transmitted to the microcontroller of the Arduino UNO board. While the LabVIEW Interface for Arduino (LIFA) serves as an interface between the Arduino microcontroller and computer to make communication between the microcontroller and LabVIEW through a serial connection.

How a PV panel's output power reading is done?
The PV panel's output power reading is done out by the product of the current and voltage reading. Finally,in the last part,the I-V and P-V curves of PV panel characteristics will be plotted in the monitoring interface of the system by using x/y graphs in the LabVIEW palette.

In short, dual axis solar tracking system was built successfully with the implementation of PID controller. The purpose of dual axis solar tracking system with the implementation of PID controller is to control and monitor a more accurate solar panel movement based on the light intensity.

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microcontroller and the computer. For this, you just need to ...

This information is very important in the design. Solar panel performance monitoring [5] was designed for the real-time monitoring and control of solar panels using LabVIEW, which can show ...

This Project proposes a novel design prototype of solar tracking PV system which utilizes the feedback control theory along with two light ...

Researchers developed a real-time solar cell measurement and control system to locate, track, and transfer the maximum power point of a photovoltaic (PV) array. ... We designed a solar energy MPPT device using LabVIEW software for user interface development and to generate new algorithms. We used the LabVIEW FPGA Module to acquire high-speed ...

captured properly through tracking control system. ... sun-tracking methods for maximizing solar systems. output, Renewable and Sustainable Energy Revie ws, 13 (8) (2009), ...

projects that use classical control experiments: solar tracking, water level control, salinity control, temperature control of a chamber. For the control experiments, the system behavior is observed rather than modeled and the control is performed with National Instruments equipment and LabVIEW graphical programming language.

Maximum Power Point Tracker - This Project is the development of MPPT (Maximum Power Point Tracker) System. This system tracks the mechanical sun to produce maximum power from the solar panel. The MPPT charges the battery and an inverter is connected with battery to convert DC to AC for the load attached with it. Furthermore, battery charging is monitored via ...

The results show that the first solar cell generates about 22% larger than second solar cell in term of average output power. Besides that, the authors also state that solar tracking systems ...

This thesis outlines the implementation and commissioning of a LabVIEW based, dual axis solar tracking system located within Murdoch Universitys Renewable Energy Outdoor Test Area. An electrical system that is capable of supplying power ...

LabVIEW is used to mimic a 150 W solar panel using the (pulse width modulation) PWM method. Standalone photovoltaic systems have been studied with improved Perturb & Observe MPPT using confined search space [27, 28]. The use of LabVIEW to create a data acquisition system for solar cells has been described .

The review of control algorithms implemented in solar tracking systems presented in revealed that the closed-loop algorithm is the most widely used. Fathabadi et al. [12] proposed a sensorless closed-loop strategy based on feedback of the power at the maximum power point tracking to detect the direction of the tracker in which the maximum ...

Muthukrishnan, R., & Padmanaban, S. (2018). Arduino-based smart solar tracking system. In 2018 Second International Conference on Inventive Communication and Computational Technologies (ICICCT ...

This research focuses on the design and implementation of a movement strategy for a photovoltaic (PV) system, presented through four phases: First came the design of the mechanical part and the selection of geared motors with high torque and low power consumption, while having a solid mechanical structure that supports the panel. An open-loop control was ...

The solar tracking works on the principal of astronomical equations. With the help of the equation it calculates the coordinates of the sun by calculating the elevation and azimuth ...

Solar energy can reduce the need of fossil fuel and ensures energy security for many countries. Solar tracking significantly improves the collection of solar energy by reducing the angle of incidence on the collecting surface. The present research introduces an optimized solar tracking system that enhances the output power of photovoltaic panels. The tracking system ...

LabVIEW. The performance of the system has been tested and compared with static solar panel. This paper describes the design of a low cost, solar tracking system. Keywords: solar tracking, Arduino, LabVIEW 1. INTRODUCTION The world population is increasing day by day and the demand for energy is increasing accordingly.

Solar panel performance monitoring [5] was designed for the real-time monitoring and control of solar panels using LabVIEW, which can show graphics and tracks the voltage, current and light ...

Solar energy is quite simply the energy produced directly by the sun. This project aims at the development of process to track the sun and attain maximum efficiency using Arduinouno and LabVIEW for real time monitoring. The project ...

The present work is focused on providing a microcontroller based automatic two-axis sun tracker using Photodiodes as sensors to track sun. The system is assisted with a manual control ...

In this work, a systematic review of the control algorithms implemented in active solar tracking systems is presented. These algorithms are classified according to three solar tracking control strategies: open-loop, closed-loop and combined open- and closed-loop schemes herein called hybrid-loop.

To make solar energy more useful, the efficiency of solar array systems must be maximized. A feasible approach to maximize the efficiency of solar array systems is Solar Radiation tracking. Automatic Solar Radiation Tracker is a system that controls the movement of a solar array so that it is constantly aligned towards the direction of the sun.

In this study, a machine vision control approach for a sun tracking system (STS) is designed, implemented, and performance is evaluated. The aim is to dynamically track the sun"s centroid with ...

Key words. Photovoltaic energy system, labview, ni myrio, solar tracking control system, maximum energy output. 1. Introduction Green energy has been played an important role in our day life in these days. It is clean and unexhausted compared with the traditional energies. Solar energy is very popular among them.