

Can a stand-alone solar power generation system be controlled?

The proposed novel control strategy has been applied to the stand-alone solar power generation system and is physically illustrated in Figure 10. Initially, the standalone solar power generation system is constructed using a PV simulator (as detailed in Table 3) which is supervised by a computer.

Can a control strategy be used in a solar power generation system?

As the proposed novel control strategy design has been used for conventional solar power generation system hardware, the control strategy can suitably be expanded to larger stand-alone solar power generation systems. It can even be used in grid-connected and hybrid solar power generation systems.

How can a PV generation regulation be implemented?

Similarly, a PV generation regulation can be implemented through a current control loop with a current reference proportional to limit power. This method is known as current limiting. Direct power control and current limiting methods operate independently of the MPPT methods. But, modified MPPT methods can also limit active power.

What are the main control objectives in PV systems?

The main control objectives in PV systems are maximum power and power quality. But, considering the growth of PV systems and other renewable energies connected to power grid, current grid codes are adapting new impositions to mandate that distributed energy resources have specific grid support functions.

What are the main controls of solar plants?

The main controls of solar plants can be classified in Sun tracking and control of the thermal variables. While the control of the Sun tracking mechanisms is typically done in an open loop mode, the control of the thermal variables is mainly done in closed loop.

How to control a grid-connected PV power generation system?

In order to achieve the optimal control of a grid-connected PV power generation system, and maximize the utilization of solar energy, MPC strategies for PV modules and the inverter are proposed, respectively. From the linear PV array model obtained by model identification, a model predictive controller is designed for modules.

This research introduced a novel control strategy designed for standalone solar power generation systems, aiming to enhance the system efficiency and reduce the THD of the system output voltage. By improving the ...

This paper has proposed maximum power point tracking (MPPT) control for stand-alone solar power generation systems via the type-2 Takagi-Sugeno (T-S) fuzzy-model-based approach. ...

The control of solar photovoltaic (PV) systems has recently attracted a lot of attention. ... systems are not only power generation systems but also active systems to optimize the grid performance.

Direct power control method is based on power settings, in which the limit power is tracked by power controllers. Similarly, a PV generation regulation can be implemented through a current control loop with a current ...

Hirose, T.; Matsuo, H. Standalone Hybrid Wind-Solar Power Generation System Applying Dump Power Control without Dump Load. IEEE Trans. Ind. Electron. 2012, 59, 988-997. [Google Scholar] Hossain, M.K.; Ali, ...

As the world's attention turns to cleaner, more dependable, and sustainable resources, the renewable energy sector is rising quickly. The decline in world energy use and climate change ...

The general trend identified in PV systems control is the development of increasingly robust controllers for operation under better conditions of efficiency, quality, stability, safety and economic operation. In ...

This article briefly analyzes the technical advantages of the wind-solar hybrid power generation system, builds models of wind power generation systems, photovoltaic systems, and storage ...

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