



Extremely Controlled Lithium Battery Pack Equalizer

Battery module, selection circuit, CUK equalizer are explained in Section 2.1; the selection circuit switch control module is based on the state of each battery in the battery module to achieve the switch on and off; the current control module, which is based on an adaptive PID, is implemented as a Matlab function. To validate the effectiveness ...

A multiple-time scale SOC-and-capacity-based equalisation strategy for lithium-ion battery packs with a passive equaliser was proposed to solve the problem of increasing ...

A novel charged state prediction method of the lithium ion battery packs based on the composite equivalent modeling and improved splice Kalman filtering algorithm

For simplicity, equal values are chosen for L_1 and L_2 so that equal currents flow through these inductors. The output current I_{tune} from the adaptive neuron-fuzzy controller is used to switch the period of the PWM driving signal of the proposed scheme. Hence, battery cell 2 was charged by battery cell 1 and cell 3, and the voltage at cell 2 depended on both duty cycle ...

This paper proposes a flexible modularized equalizer to facilitate the practical implementation of active equalizers in battery pack. Inspired by the integrating process of battery pack, the ...

The proposed circuit works as an equalizer when Lithium-ion battery pack is charging or discharging or standing idle. Theoretical analysis and control method have been finished, respectively.

The inconsistency of lithium-ion batteries will seriously affect the performance and safety of the battery pack in series, resulting in a decrease in the available capacity and shortening of the life span of the series battery pack. To alleviate this inconsistency, a double-layer ring-structured equalization topology is proposed, which has the advantages of flexible ...

BMSs and a low-voltage (LV) bus supply to realize the hierarchical model predictive control pack equalization. The independent pack equalizer can balance battery packs independently, which means it can adapt to any structure of the lower cell equalizer [28,29]. This facilitates structure simplification and integration of the cell equalizer on a ...

DOI: 10.1080/21642583.2018.1558418 Corpus ID: 125382406; Design of active equalizer for lithium-ion battery pack based on double-tiered modular resonance @article{Sun2018DesignOA, title={Design of active equalizer for lithium-ion battery pack based on double-tiered modular resonance}, author={Xiujuan Sun and Lingzhen Zhu and Pengfei Zhang and Mengchang Lin}, ...

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the battery to consume the energy in the battery which has more energy. Instead, active equalization equalizes energy transfer through energy storage elements. This method mainly ...

An active equalization method based on an inductor and a capacitor was proposed in Reference by combining the advantages of the fast equalization speed of ...

DOI: 10.1016/j.est.2023.109193 Corpus ID: 264055765; Research on equalization scheme of lithium-ion battery packs based on consistency control strategy @article{Liao2023ResearchOE, title={Research on equalization scheme of lithium-ion battery packs based on consistency control strategy}, author={Li Liao and Hongguang Li and Houjia Li and Jiuchun Jiang and Tiezhou ...

A lithium-ion or Li-ion battery is a type of rechargeable battery that uses the reversible intercalation of Li + ions into electronically conducting solids to store energy. In comparison with other commercial rechargeable batteries, Li-ion batteries are characterized by higher specific energy, higher energy density, higher energy efficiency, a longer cycle life, and a longer ...

Request PDF | Fuzzy controlled energy converter equalizer for lithium ion battery packs | Balancing algorithms are based on extracting or adding charge in order to have balanced cells. Their goal ...

1 Introduction. Lithium battery energy storage system plays an important role in electrical power system [1-4].To achieve large capacity and high-power output, lithium batteries have to be connected in series to use [].However, due to the fabrication process, surrounding environment and self-discharge rate of battery [6, 7], the differences among batteries tend to ...

Apart from the normal cell equalizer which causes further stress to the cells, this paper proposes a smart and dynamic cell equalizer using the forward converter to assist the individual cells in ...

So that each cell equalizer can effectively work together to achieve the equivalent of each monomer lithium-ion battery, where the maximum allowable equivalent current of the battery is designed to be a variable that changes with the external current of the battery pack, so as to avoid the battery current exceeding its allowable range. Further ...

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The inconsistency in large-scale battery pack significantly degrades the performance of electric vehicles. In order to diminish the inconsistency, the study designs an active equalization method ...



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Lithium-ion batteries are widely used in electric vehicles because of their high power and energy density, long life, low self-discharge rate, and low environmental pollution [1], [2] cause the voltage of a single cell is not enough to meet the demand, multiple cells are usually connected in series to form a battery pack [3]. However, the variation in internal ...

(DOI: 10.1109/TII.2019.2950818) Effective cell equalization is of extreme importance to extract the maximum capacity of a battery pack. In this article, two cell balancing objectives, including balancing time reduction and cells' temperature rise suppression, are taken into consideration simultaneously. Furthermore, hard constraints are imposed on the cells' state-of-charge levels ...

Effective cell equalization is of extreme importance to extract the maximum capacity of a battery pack. In this article, two cell balancing objectives, including balancing time reduction and cells' temperature rise suppression, are taken into consideration simultaneously. Furthermore, hard constraints are imposed on the cells' state-of-charge levels, currents, and equalizing currents. ...

The inconsistency of the large-scale battery pack dramatically diminishes the performance of electric vehicles. This paper proposes a flexible modularized equalizer to facilitate the practical implementation of active equalizers in battery pack. Inspired by the integrating process of battery pack, the proposed modularized equalizer is grouped into the intra-module equalizer and the ...

associated with the battery pack equalizers and provides recommendations for future investigations. We think that this work will lead to an increase in efforts on the development of an advanced ...

Battery inconsistency in electric vehicles is an important factor causing battery capacity degradation and safety problems. Therefore, battery equalization technology plays an important role in improving the performance and safety of battery packs. Among the existing equalization technologies, passive equalization is inefficient and active equalization is ...

The inconsistency of lithium-ion batteries will seriously affect the performance and safety of the battery pack in series, resulting in a decrease in the available capacity and shortening of the life span of the series battery pack. To alleviate this inconsistency, a double-layer ring-structured equalization topology is proposed, which has the advantages of flexible equalization path and ...

Lithium batteries have become the main power source for new energy vehicles due to their high energy density and low self-discharge rate. In actual use of series battery packs, due to battery internal resistance, self-discharge rate and other factors, inconsistencies between the individual cells inevitably exist.

An efficient multi-mode energy equalizer for lithium-ion battery packs is proposed and energy balance strategies are studied in this paper. The energy balance strategies include the selection of ...



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The equalization topology is divided into two forms: intra-group and inter-group, the centralized equalization topology based on single inductor is adopted within the battery ...

The energy flow is step-by-step among Lithium-ion-battery when an equalizer based on the buck-boost converter is adopted, resulting in a long energy transmission path and low equalization efficiency.

In order to overcome the imbalance of cells in series lithium-ion battery pack, this paper proposes a new switched equalization and its FSM control method. N-MOSFETs and P-MOSFETs are used to build the switch array of the equalization. The Buck-Boost circuit including a super capacitor is used to achieve the energy balance in cells. The equalization strategy based on FSM ...

Abstract: This paper proposes a fast equalization method for lithium-ion battery packs based on reconfigurable battery structure and designs a new switching circuit topology. By adding PWM ...

Slight differences between the series connected cells in a lithium ion (LiIon) battery pack can produce imbalances in the cell voltages, and this greatly reduces the charge capacity. An electronic equalizer (EQU) must be used to balance the cell voltages individually since these batteries cannot be trickle charged like a lead acid battery. This is because even a ...

DOI: 10.1016/j.est.2023.107696 Corpus ID: 258805477; A switchable indicator for active balance of the lithium-ion battery pack using a bypass equalizer @article{Liu2023ASI, title={A switchable indicator for active balance of the lithium-ion battery pack using a bypass equalizer}, author={Yuling Liu and Jinhao Meng and Feng Yang and Qiao Peng and Jichang Peng and ...

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