

SolarMax Energy Systems

Power saving for base station of communication system



Overview

What is the energy-saving technology of base stations?

This technical report focuses on energy-saving technology of base stations. Some energy saving technologies since 4G era will be explained in details, while artificial intelligence and big data technology will be introduced in response to the requirement of an intelligent and self-adaptive energy saving solution.

How can a base station save energy?

There are two main methods of base station energy saving, including hardware and software.

What is the power consumption of a base station?

The power consumption of each base station is considered about the number of mobile subscribers and random mobility to minimize the energy-saving cost of the cellular network.

What are the standardized energy-saving metrics for a base station?

(1) Energy-saving reward: after choosing a shallower sleep strategy for a base station, the system may save more energy if a deeper sleep mode can be chosen, and in this paper, the standardized energy-saving metrics are defined as (18) $R_{ie} = E_{SM=0} - E_{SM=i}$ $E_{SM=0} - E_{SM=3}$.

Why do base stations waste so much energy?

When there is little or no communication activity, base stations typically consume more than 80% of their peak power consumption, leading to significant energy waste . This energy waste not only increases operational costs, but also burdens the environment, which is contrary to global sustainability goals .

Why does network sensitivity affect the energy consumption of base stations?

In addition, the high sensitivity of the existing policies to network conditions during the period when the network load is relatively smooth may lead to unnecessary and frequent switching of the sleep mode of the base stations, thus adding non-negligible additional energy consumption.

Power saving for base station of communication system



Research on Performance of Power Saving Technology for 5G ...

It is found that within a network of 42 cells 7.26% power can be saved by switching off seven base stations during off-peak traffic hours. IEEE 802.16e is extensively used these days for both ...

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METHOD AND APPARATUS FOR SAVING POWER CONSUMPTION OF BASE STATION ...

As communication technology evolves recently, power consumption in a network is continuously increasing. In order to meet rapidly increasing data traffic demands, a ...



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✓ LIQUID/AIR COOLING

✓ INTELLIGENT INTEGRATION

✓ PROTECTION IP54/IP55

✓ BATTERY /6000 CYCLES



Green Base Station Solutions and Technology

This paper discusses green base stations in terms of system architecture, base station form, key power-saving technologies, and green technology applications. It aims to find ...

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Communication Base Station Energy Solutions

Due to harsh climate conditions and the absence of on-site personnel to maintain fuel generators, the company required a reliable solution to ensure the base ...

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Energy-Saving Techniques in the Next Generation of ...

Research conducted by mobile communication organizations such as Ericsson and the Next-Generation Mobile Networks (NGMNs) Alliance has ...

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Communication Base Station Energy Solutions

The Importance of Energy Storage Systems for Communication Base Station
With the expansion of global communication networks, especially the ...

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Communication Base Station Energy Solutions

Due to harsh climate conditions and the absence of on-site personnel to maintain fuel generators, the company required a

reliable solution to ensure the base station's stable operation and ...

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Research on Performance of Power Saving Technology for 5G Base Station

Compared with the fourth generation (4G) technology, the fifth generation (5G) network possesses higher transmission rate, larger system capacity and lower tran

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Evaluation of the power-saving effect of 5G base station based on AI

The research shows that the method proposed in this paper has a certain energy-saving effect, can meet the energy efficiency requirements of 5G ultra dense base station, and ...

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US10164915B2

The present invention relates to a mobile

communication system, a base station, a mobile station, and a power-saving transmission and reception method used in them, and more particularly, to ...

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Monitoring and optimization of energy consumption of base transceiver

Monitoring of energy consumption is a great tool for understanding how to better manage this consumption and find the best strategy to adopt in order to maximize reduction of ...

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Research on Performance of Power Saving Technology for 5G Base Station

It is found that within a network of 42 cells 7.26% power can be saved by switching off seven base stations during off-peak traffic hours. IEEE 802.16e is extensively used these days for both ...

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Final draft of deliverable D.WG3-02-Smart Energy Saving of ...



This technical report explores how network energy saving technologies that have emerged since the 4G era, such as carrier shutdown, channel shutdown, symbol shutdown etc., can be ...

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Energy-saving control strategy for ultra-dense network base stations

To reduce the extra power consumption due to frequent sleep mode switching of base stations, a sleep mode switching decision algorithm is proposed. The algorithm reduces ...



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Strategy of 5G Base Station Energy Storage Participating in the Power

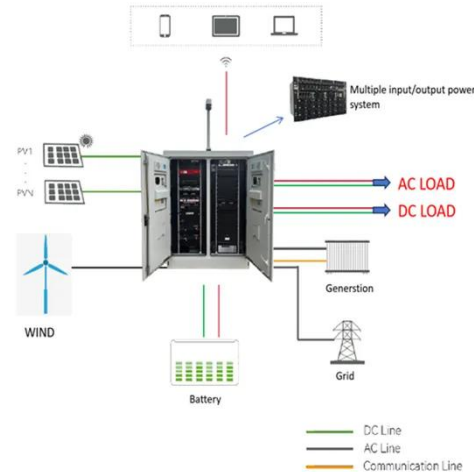
The proportion of traditional frequency regulation units decreases as renewable energy increases, posing new challenges to the frequency stability of the power system. The ...

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Optimization of Communication Base Station Battery ...

In the communication power supply field, base station interruptions may occur due to sudden natural disasters or unstable power supplies. This work studies the optimization of ...

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Energy-efficiency schemes for base stations in 5G heterogeneous

In today's 5G era, the energy efficiency (EE) of cellular base stations is crucial for sustainable communication. Recognizing this, Mobile Network Operators are actively prioritizing EE for ...

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EFFICIENT POWER UTILIZATION IN COMMUNICATION ...

This parallel increase in usage of cellular phones has lead to implementation of communication towers called base stations.. The base stations comprises of electronic equipment and ...

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Telecommunication Power System: Energy Saving, ...

Therefore, the reduction of the energetic



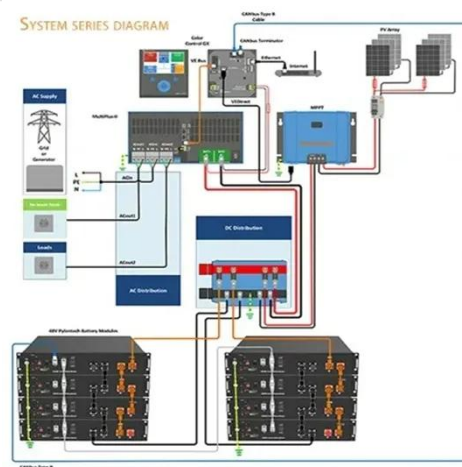
consumptions of a Telecommunications Power Systems represents one of the critical factors of ...

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Research on ventilation cooling system of communication base stations

Up to now, as the largest communication network, the maximum operating cost of the communications industry in China is the electricity. And the major power consumption of ...

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EP2541996A1

There is provided a mobile communication system that can prevent a situation in which, although there is no occasion to receive packets for a mobile station, the reception processing is ...

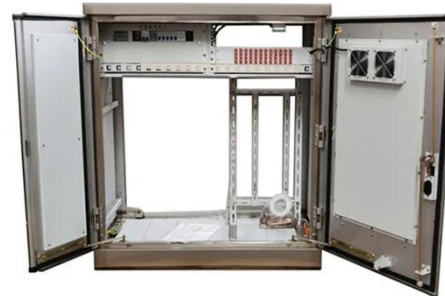
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The Energy Saving Measurement System and Method of Main Base Station

Based on the performance data of the

cell served by the communication equipment in a period of time (reflecting the cell load), the power saving amount in various ...

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The Energy Saving Measurement System and Method of Main ...

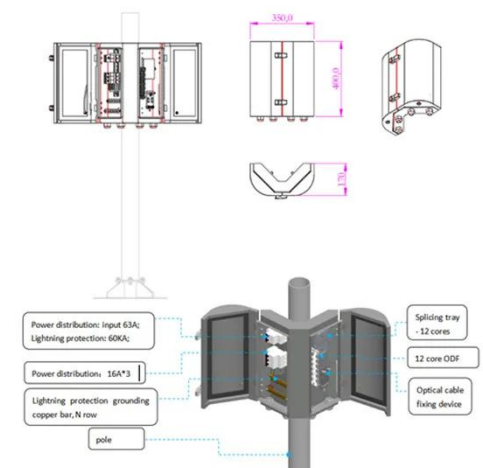
Based on the performance data of the cell served by the communication equipment in a period of time (reflecting the cell load), the power saving amount in various ...

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Energy-saving control strategy for ultra-dense network base ...

To reduce the extra power consumption due to frequent sleep mode switching of base stations, a sleep mode switching decision algorithm is proposed. The algorithm reduces ...

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Research and Verification of Power Saving Technology in LTE System



With the development of LTE networks, the scale of mobile communication networks has expanded rapidly, and equipment energy consumption has grown rapidly. This paper first ...

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Research on Performance of Power Saving Technology for 5G ...

Compared with the fourth generation (4G) technology, the fifth generation (5G) network possesses higher transmission rate, larger system capacity and lower tran



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Evaluation of the power-saving effect of 5G base station based ...

In this paper, a framework is developed to study the impact of different power model assumptions on energy saving in a 5G separation architecture comprising high power ...

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Various approaches have been proposed

to reduce the energy consumption of an RBS, for instance, passive cooling techniques, energy-efficient backhaul solutions, and distributed base ...

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Optimization of Communication Base Station Battery ...

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Optimal energy-saving operation strategy of 5G base station with

To further explore the energy-saving potential of 5 G base stations, this paper proposes an energy-saving operation model for 5 G base stations that incorporates communication caching ...

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