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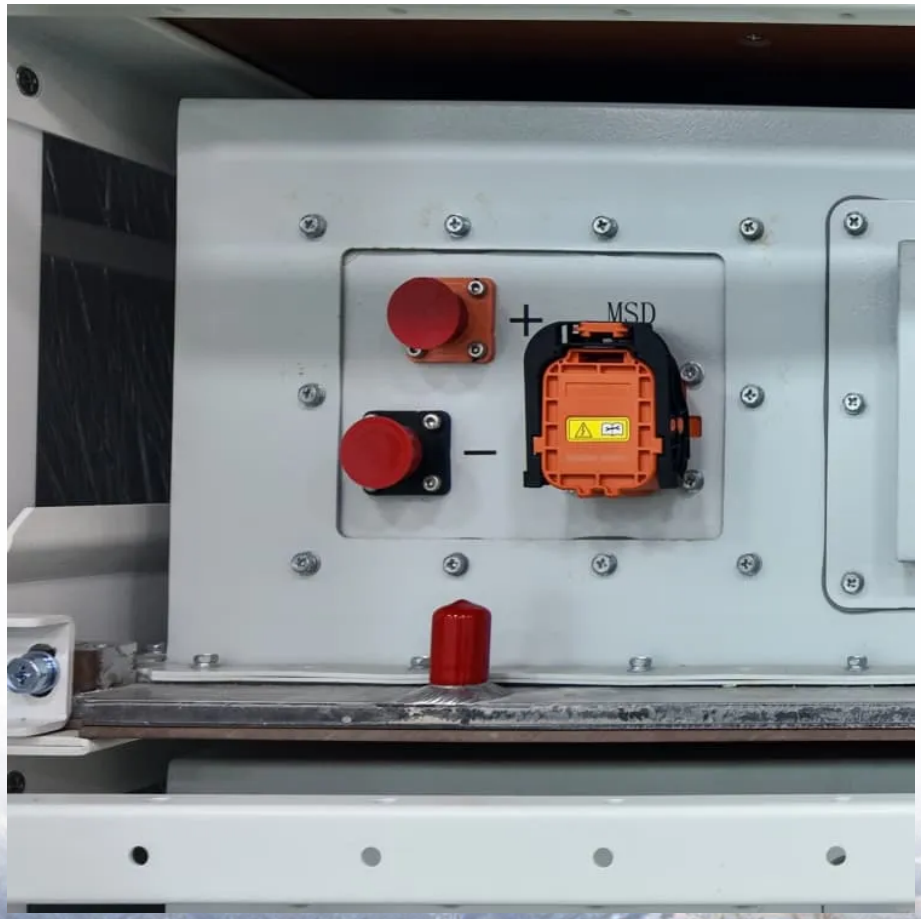
Energy-saving and consumption-reducing measures for communication base station EMS



Overview

In response to the current widespread issue of high energy consumption in 5G base stations, this article conducts overall design, hardware design, and software design of the base station energy-saving system based on the energy-saving principle of intelligent fresh air systems.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 much energy does a communication base station use a day?

A small-scale communication base station communication antenna with an average power of 2 kW can consume up to 48 kWh per day. 4,5,6 Therefore, the low-carbon upgrade of communication base stations and systems is at the core of the telecommunications industry’s energy use issues.

How can a base station save energy?

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

Will communication base stations reduce electricity consumption?

Our findings revealed that the nationwide electricity consumption would reduce to 54,101.60 GWh due to the operation of communication base stations (95% CI: 53,492.10–54,725.35 GWh) (Figure 2 C), marking a reduction of 35.23% compared with the original consumption. We also predicted the reduction of pollutant emissions after the upgrade.

What is a base station energy optimization?

The optimization covers configurations of base station energy supply

equipment (e.g., investment in photovoltaics [PV] and energy storage capacity) and operational locations (e.g., urban vs. rural deployments).

How effective are communication base stations in reducing air pollution?

In Figure 5 A, after implementing optimization measures to communication base stations, the cases of COPDs related to air pollution caused by communication base stations in 2021 would be reduced to 13,004 (65% reduction). The effectiveness of these optimizations becomes more pronounced in the following year.

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The Definition of Energy Saving MeasurementIntroduction to The Model Usage AlgorithmThe Overview of GBRT AlgorithmNew Energy Saving FormulaThere are two parts in the energy saving calculation system and method of the main base station communication equipment. The first step is to select the appropriate modeling indexes to reduce index dimension based on the above algorithm from more than 100 indicators of network management through the chi-square test, Pearson correlation analysis and See more on link.springer ScienceDirect

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