

Frequent switching of inverters in communication base stations





Overview

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.

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.

Can a switching converter generate high amplitude switching noise?

Various nodes of a switching converter can generate high amplitude switching noise in the 100-MHz+ range. Figure 1 shows an a-coupled voltage measurement taken at the input (CH1-top, brown) and output (CH2-bottom, blue) of a TPS63700 configured to provide $V = -12\text{ V}$ at 150 mA from $V = 5\text{ V}$. The time scale is 80 ns/div.

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) $R_{ie} = E_{SM} = 0 - E_{SM} = i E_{SM} = 0 - E_{SM} = 3$.

How does distributed execution affect base station control?

In the distributed execution phase, each actor network makes decisions independently based only on its own network and observations, and although each actor executes independently, the whole system is able to obtain a better base station control strategy because their strategies are based on the results of global optimization. Fig. 2.



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 .



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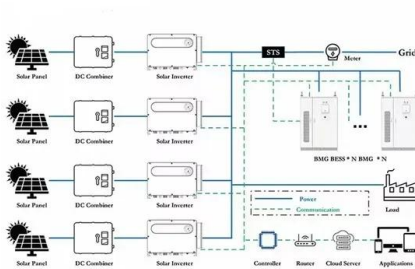
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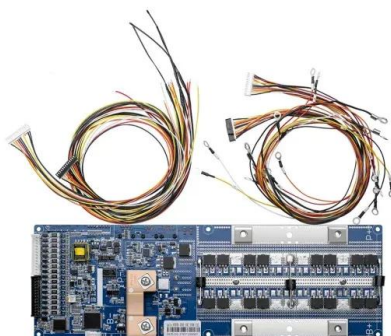
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