Höcherl & Hackl
The electronic load

Solar Balancing Technic at Solar Car

The Solar Team Twente, part of TU Twente in the Netherlands, designs and builds a solar car every other year to participate in the World Solar Challenge in Australia.

In 2017, the SOLAR TEAM TWENTE took part with the RED SHIFT, a solar car in which the so-called Solar Balancing technique called „SABINE" was applied.
SABINE stands for Solar Array Balancing Interface Not Expected. It ensures that losses caused by the differences between the revenues of solar cells, also called Grouping Loss, are marginalized. SABINE „removes" energy from high-performance cell groups and gives it to poorly-performing groups. This gives a considerable boost to the total energy yield.

Test with Electronic Load PLI3230

In order for SABINE to perform at its best, it had to be perfectly adjusted for the solar panel. This meant a lot of testing. The following set up was used for this purpose:

The load was connected to the output of the MPPT to replace a battery. The load was then set to constant voltage operating mode, so that the MPPTs could boost the panel voltage to the set voltage. This made it possible to test continuously without having to charge a battery.
In addition, the complete test setup had to be flexible in order to be able to move it to the optimal location for testing. Moving a solar car battery is done as carefully and as little as possible, so that it remains in optimal condition for the race, and the risk of accidents would be low. The H&H PLI 3230 load was ideally suited for these test purposes.

Conclusion

SABINE 2.0, one of the biggest innovations in the RED Shift, is an electronic component that ensures efficiency in solar revenue from the solar panel on the car. Thanks to SABINE, the team finished third in 2015: half an hour earlier than before. They held on to this spot in 2018.

SABINE is back: totally redesigned and now twice as efficient.

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