

The Newest Smart Charging Station “Aker”

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Summary

The goal of this project is to develop a new type of smart, modular charging stations that combine the ability to simultaneously charge five devices with Quick Charge technology and wireless charging.

Research methods in the course of work were:

- Experiment – creation of a working prototype of the device; conducting experiments to determine the efficiency of energy transfer, reliability of protection systems; research on the fast charging process;
- Observation with the help of measuring devices on the physical parameters of the prototype;
- Analysis – processing of the obtained results, development of a new type of smart charging station, research of existing charging stations on the market.

Different necessary electrical components, materials, tools, software were used in the project.

During the work, the main shortcomings of existing charging stations were found, in particular: poorly developed battery protection systems, lack of control of charging parameters, lack of Quick Charge and wireless charging, high price of some solutions.

Solving these problems led to the creation of the Smart Charging Station “Aker”. The device was built according to the principle of modularity, which allowed to significantly improve maintainability and expand the range of its capabilities (the removable battery compartment can be used as a separate powerbank). To implement the device, a large amount of technical documentation for various types of electronic components was analysed, mathematical calculations were carried out, the electronic circuits of the device were developed, and the program code for the microcontrollers was written, a general 3D model of the device was created and printed.