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SOFTWARE-DEFINED LAUNCH VEHICLE

**Abstract**

To solve the problem that currently the software and hardware of launch vehicle electrical system are so tightly coupled that the flexibility of the combination and the intelligence and universality of the system are jeopardized, this paper adopts the design thinking of "software-defined" and puts forward the concept of Software-Defined Launch Vehicle (SDLV). Derived from the idea of "software-defined", the definition of SDLV is to realize the separation of the centralized control of logic and the centralized process of data on the basis of the electrical system of vehicles so as to abstract a launch vehicle model with centralized management and distributed execution. The product as a launch vehicle electrical system is more intelligent, adaptable and expandable, and most of the functions are achieved through software or firmware. The system can be reconfigured by changing software so as to improve the flexibility, and at last a universal launch vehicle electrical system can meet various demands of different launch vehicles by changing the software at application layer, which can reduce the cost, shorten the lead time, and decrease the technology control risk in order to satisfy the needs of space launch in the future.

This paper discusses the concept, design goals and layered structure of SDLV and analyzes the differences between current vehicles and SDLV. Finally, it presents the implementation steps and key technologies that might be involved of SDLV.