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PAYLOAD SERVICE UNIT FOR THE ILR-33 AMBER 2K ROCKET

Abstract

Suborbital rockets are used extensively for microgravity research, technology validation, ionosphere, and atmosphere research as well as astronomy. While orbital launches are becoming more affordable to wider audience, suborbital flight still fills a niche thanks to its relative ease of payload retrieval and capability of accessing the upper layers of the Earth's atmosphere. The ILR-33 AMBER 2K rocket aims to render access to dedicated suborbital flight even simpler. In order to better accommodate payload users, a unified power and communication interface has been developed. This allows for easier integration of payloads with the launcher, reducing the cost and development time. The Payload Service Unit (PSU) provides up to 250 W of power, communication, and data storage for up to 3 experiments on-board. Information about in-flight events, as well as navigation and orientation data can be provided to the payloads if needed. Telemetry downlink from the experiments is possible with the use of a separate RF communication system. Thanks to its utilization of the OBC-K1 module standard, developed previously for the ILR-33 AMBER rocket, the PSU can be easily tailored to suit specific mission needs. This paper presents the general philosophy behind the PSU design, including the use of OBC-K1 module standard and its benefits. The implementation of the design is discussed. System integration and test results are presented. Lessons learned from the project implementation are addressed, along with possible future development.